

National Core Maternity Indicators

Web report | Last updated: 13 Jul 2023 | Topic: [Mothers & babies](#)

About

The National Core Maternity Indicators (NCMI) present information on measures of clinical activity and outcomes. The purpose of the NCMI is to assist in improving the quality of maternity services in Australia by establishing baseline data for monitoring and evaluating practice change. These indicators cover data for the majority of women who gave birth in Australia from 2004 to 2021 and are grouped into 3 broad topic areas - antenatal period, labour and birth, and birth outcomes.

Cat. no: PER 95

Findings from this report:

- [Around 1 in 12 \(8.3%\) women giving birth in 2021 smoked during the first 20 weeks of pregnancy](#)
- [In 2021, around 1 in 3 \(33%\) selected women giving birth for the first time had a caesarean section](#)
- [Labour was induced for 44% of selected women giving birth for the first time in 2021](#)
- [In 2021, 1.3% of live born babies born at or after term had an Apgar score of less than 7 at 5 minutes](#)

Summary

This report is an online presentation of the 12 National Core Maternity Indicators currently reported. The indicators provide the most recent data available and assist in the assessment, monitoring and evaluation of patient care.

Antenatal period indicators

Antenatal care in the first trimester	Antenatal care before 10 weeks	Smoking in the first 20 weeks	Smoking after the first 20 weeks
Around 4 in 5 women (80%) giving birth in 2021 received antenatal care in their first trimester	Around 3 in 5 (61%) women giving birth in 2021 attended antenatal care within the first 10 weeks of pregnancy	Around 1 in 12 (8.3%) women giving birth in 2021 smoked during the first 20 weeks of pregnancy	Around 3 in 4 (72%) women giving birth in 2021 who reported smoking continued to smoke after 20 weeks of pregnancy

Labour and birth indicators - selected women

Selected women include those giving birth for the first time, between 20 and 34 years of age, whose baby's gestational age at birth was between 37 and 40 completed weeks, and was a singleton baby in the vertex presentation. Comparison of 'selected' groups of women allows for an indication of standard practice. Selected women, for these indicators, refers to a cohort of mothers who are expected to have reduced labour complications and better birth outcomes.

Caesarean section	Induction of labour	Non-instrumental vaginal birth	Instrumental vaginal birth
In 2021, around one third (33%) of selected women giving birth for the first time had a caesarean section	In 2021, 44% of selected women giving birth for the first time had an induced labour	Around 2 in 5 (42%) selected women giving birth for the first time in 2021 had a non-instrumental vaginal birth	Around 1 in 4 (24%) selected women giving birth for the first time in 2021 had an instrumental vaginal birth

Labour and birth indicators - all women

Episiotomy births (non-instrumental)	Episiotomy births (instrumental)	General anaesthetic for caesarean section births	Vaginal birth after caesarean
In 2021, nearly one quarter of women (23%) having their first baby vaginally without the use of instruments had an episiotomy	In 2021, around 4 in 5 women (81%) having their first baby vaginally with the use of instruments had an episiotomy	In 2021, around 1 in 20 (5.3%) women who had a caesarean section birth had general anaesthetic	In 2021, around 1 in 8 women (12%) had their second birth vaginally after having their first birth by caesarean section

Birth outcome indicators

Apgar score	Small babies	Third and fourth degree tears for first-time mothers	Third and fourth degree tears for all women
In 2021, 1.3% of liveborn babies born at or after term had an Apgar score of less than 7 at 5 minutes	In 2021, 1.1% of babies born at, or after, term were classified as small	In 2021, 4.5% of women having their first birth vaginally had a third or fourth degree tear	In 2021, 2.7% of women having a vaginal birth had a third or fourth degree tear



Geographic overview



Geographic overview

A mother's usual place of residence may be different to where she gives birth and can impact on access to health services.

The interactive data visualisation (Figure 1) presents statistics on all 12 National Core Maternity Indicators by the state or territory in which a mother gave birth. Select the Data tables button to view data between 2011 and 2021 and use the drop-down menu to view data for each indicator.

Figure 1: National Core Maternity Indicators by state and territory of birth

National Core Maternity Indicators by state and territory of birth

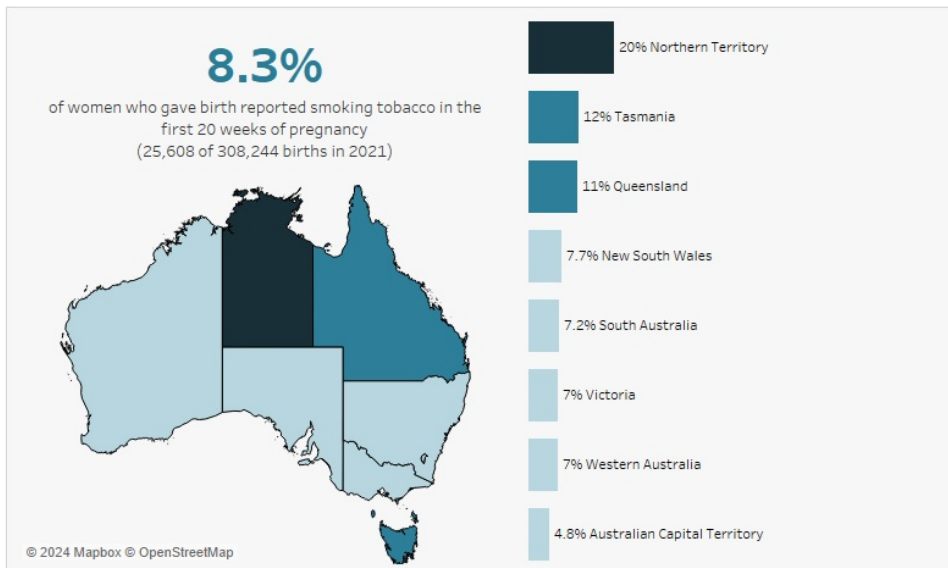
The chart shows the latest data for each state and territory for each indicator. The first indicator listed shows the proportion of all women who gave birth who smoked in the first 20 weeks of pregnancy in 2021. Overall for Australia, 8.3% of all women who gave birth smoked in the first 20 weeks of pregnancy in 2021. The percentage of women who gave birth who smoked in the first 20 weeks of pregnancy in 2021 across the states and territories varied between 4.8% and 20%.

Smoking in the first 20 weeks of pregnancy for all women giving birth by state and territory of birth, 2021

Select indicator:

Smoking in the first 20 weeks of pregnancy for all women giving birth

 Data tables



Notes:

1. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
2. Mother's tobacco smoking status during pregnancy is self-reported.
3. Because of some jurisdictional 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 smoked' 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 therefore difficult to report accurately at time of birth.
5. For Tas, a change in collections methods were implemented in the electronic system in 2018. Care must be taken when comparing Tas with other jurisdictions.

Source: AIHW analysis of NPDC data.
<https://www.aihw.gov.au>

Geographic overview

A mother's usual place of residence may be different to where she gives birth and can impact on access to health services.

The interactive data visualisation (Figure 2) presents statistics on all 12 National Core Maternal Indicators by the Primary Health Network (PHN) of the mother's usual residence. Select the Data tables button to view data between 2012 and 2021 and use the drop-down menu to view data for each indicator.

Figure 2: National Core Maternity Indicators by Primary Health Network of mother's usual residence


National Core Maternity Indicators by Primary Health Network (PHN) of mother's usual residence

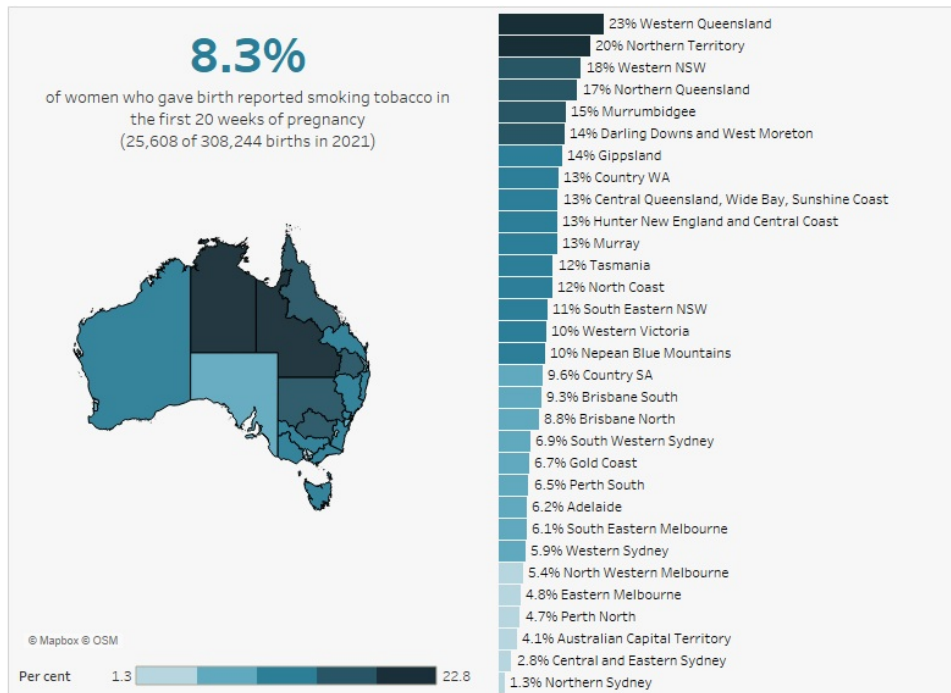
The chart shows the latest data for all 31 Primary Health Networks (PHNs) for each indicator. The first indicator listed shows the proportion of all women who gave birth who smoked in the first 20 weeks of pregnancy in 2021. Overall for Australia, 8.3% of all women who gave birth smoked in the first 20 weeks of pregnancy in 2021. The percentage of women who gave birth who smoked in the first 20 weeks of pregnancy in 2021 across PHNs varied between 1.3% and 23%.

Smoking in the first 20 weeks of pregnancy for all women giving birth by PHN of mother's usual residence, 2021

Select indicator:

Smoking in the first 20 weeks of pregnancy for all women giving birth

 Data tables



Notes:

1. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
2. Mother's tobacco smoking status during pregnancy is self-reported.
3. Because of some jurisdictional 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 any time of birth.
5. Prior to 2016, Primary Health Network (PHN) of mother's usual residence was derived from Statistical Area Level 2 (SA2) of the ABS 2011 Australian Statistical Geography Standard (ASGS), except in the ACT from 2012-2015 and the NT in 2012, where mother's postcode of usual residence was used. From 2017, PHN was derived from SA2 of the ABS 2016 ASGS. PHN was 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'.

Source: AIHW analysis of NPDC data.
<https://www.aihw.gov.au>

Geographic overview

A mother's usual place of residence may be different to where she gives birth and can impact on access to health services.

The interactive data visualisation (Figure 3) presents statistics on all 12 National Core Maternal Indicators by the Statistical Area Level 3 (SA3) of the mother's usual residence for the 3-year period, 2019-2021. Select the Data tables button to view data by SA3 and use the drop-down menu to view data for each indicator.


Figure 3: National Core Maternity Indicators by SA3 of mother's usual residence
National Core Maternity Indicators by Statistical Area Level 3 (SA3) of mother's usual residence

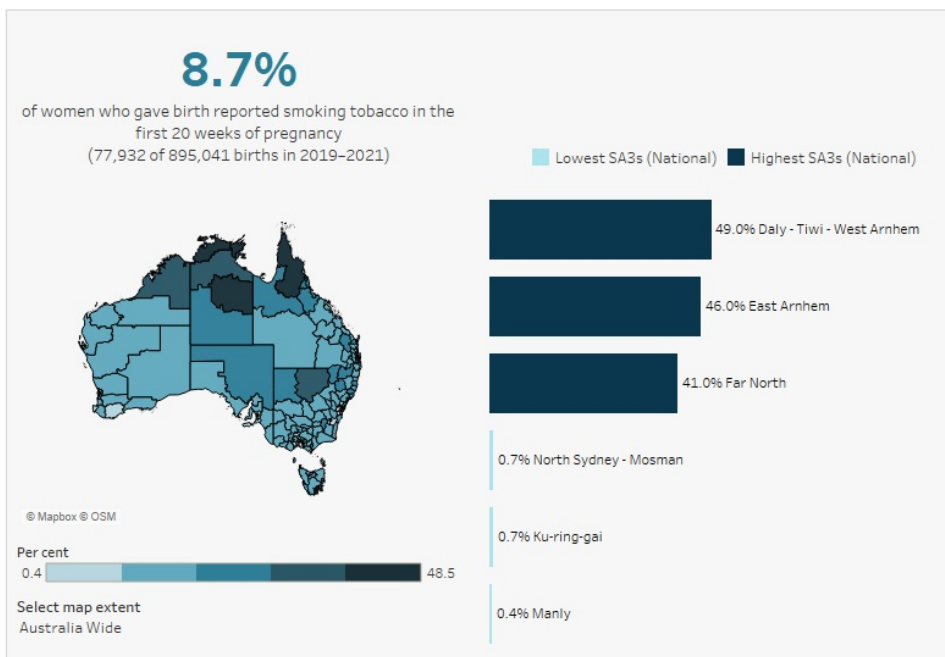
The chart shows the latest data for each of the 340 SA3s for each indicator. The first indicator listed shows the proportion of all women who gave birth who smoked in the first 20 weeks of pregnancy using a three-year aggregate, 2019-2021. Overall for Australia, 8.7% of all women who gave birth smoked in the first 20 weeks of pregnancy in 2019-2021. The percentage of women who gave birth who smoked in the first 20 weeks of pregnancy in 2019-2021 across SA3s varied between 0.4% and 49%.

Smoking in the first 20 weeks of pregnancy for all women giving birth by SA3 of mother's usual residence, 2019-2021

Select indicator:

Smoking in the first 20 weeks of pregnancy for all women giving birth

 **Data tables**



Notes:

- Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
- Mother's tobacco smoking status during pregnancy is self-reported.
- Because of some jurisdictional differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
- Data for Statistical Area Level 3 (SA3) of mother's usual residence reported using a 3 year aggregate, 2019-2021. In 2021, SA3 derived from SA2 of the ABS 2016 ASGS. SA3 only calculated where geographical area of usual residence was provided. Exclude mothers not usually resident in Australia and those whose state or territory of usual residence was 'Not stated'.
- 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 any time of birth.
- n.p. not publishable - data were suppressed due to concerns about confidentiality or low reliability.

Source: AIHW analysis of NPDC data.
<https://www.aihw.gov.au>

Antenatal period indicators

The Antenatal period covers the time from conception until birth. The National Core Maternity Indicators (NCMIs) associated with the antenatal period present information on measures of clinical activity and mother's risk factors between 2011 and 2021.

Data for these indicators are presented by jurisdiction of birth, mother's age at birth, mother's First Nations status, hospital sector, hospital's size (as measured by annual number of births), remoteness of mother's usual residence, and disadvantage quintile of mother's usual residence.

During the antenatal period

Two antenatal period indicators are presented in this report. Table 1 compares the proportion of women in the current year (2021) to the baseline year, enabling comparison between these 2 points in time.

Table 1: Antenatal indicators by proportion for baseline year and 2021

Indicator number	Indicator	Baseline year	Baseline year (%)	Current year 2021 (%)
PI 01a	Tobacco smoking in pregnancy in the first 20 weeks of pregnancy for all women giving birth	2011	12.9	8.3
PI 01b	Tobacco smoking in pregnancy after the first 20 weeks of pregnancy for all women who gave birth and reported smoking during the first 20 weeks of pregnancy	2011	70.8	72.4
PI 02a	Antenatal care in the first trimester for all women giving birth	2011	65.7	79.6
PI 02b	Antenatal care in the first 10 weeks for all women giving birth	2011	37.5	60.7

Antenatal period indicators

Smoking during pregnancy is an important preventable risk factor for pregnancy complications and is associated with poorer perinatal outcomes. Supporting women to stop smoking during pregnancy can reduce the risk of adverse outcomes for mothers and their babies. Support to stop smoking is widely available through antenatal clinics. For more information, see Clinical commentary.

This indicator examines the number of all women who gave birth who reported smoking in the first 20 weeks of pregnancy and those who reported continuing to smoke after the first 20 weeks of pregnancy.

Key findings

- Around 1 in 12 women (8.3%) giving birth in 2021 reported smoking in the first 20 weeks of pregnancy, with almost three quarters of these women (72%) reporting continuing to smoke after the first 20 weeks of pregnancy.
- The proportion of women reporting smoking in the first 20 weeks of pregnancy declined from 13% in 2011 to 8.3% in 2021, while the proportion of women continuing to smoke after the first 20 weeks of pregnancy has slightly increased from 71% in 2011 to 72% in 2021.

The proportion of women reporting smoking in the first 20 weeks of pregnancy:

- generally declined with increasing age, with women younger than 20 having the highest smoking rates (32% in 2021)
- was highest for women living in areas of most disadvantage and lowest for women living in areas of least disadvantage
- was highest for women living in *Very remote* areas and lowest for women living in *Major cities*.

The interactive data visualisation (Figure 4) presents data on women who reported smoking in the first 20 weeks of pregnancy and for those who reported continuing smoking after the first 20 weeks, by selected maternal characteristics. Select the trend button to see how data have changed between 2011 and 2021.

Figure 4: Smoking during pregnancy

Smoking in the first 20 weeks of pregnancy for all women giving birth, 2011 to 2021.

The chart displays the percentage of women who smoked during the first 20 weeks of pregnancy for the current data 2021 and trend data from 2011 to 2021. The overall proportion of smoking among Australian mothers decreased from 13% in 2011 to 8.3% in 2021.

The chart also displays the proportion of all women who gave birth and reported smoking during the first 20 weeks of pregnancy and reported smoking during pregnancy after twenty weeks. The percentage of mothers who reported smoking during both periods has increased from 71% in 2011 to 72% in 2021.

Smoking in the first 20 weeks of pregnancy for all women giving birth by state/territory of birth, 2021

Select indicator

Smoking in the first 20 weeks of pregnancy for all women

giving birth

View data by

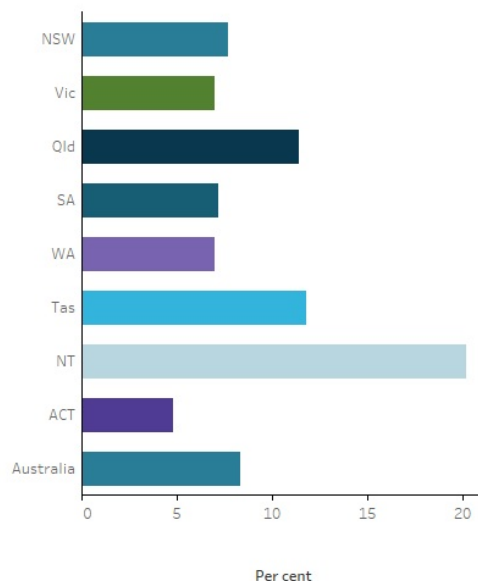
State/territory of birth



Trend data



Data tables



Notes:

1. Data excludes mothers whose smoking status was not stated.
2. Mother's tobacco smoking status during pregnancy is self-reported.
3. Because of some jurisdictional 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 smoked' 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 therefore difficult to report accurately at time of birth.
5. For Tas, a change in collections methods were implemented in the electronic system in 2018. Care must be taken when comparing Tas with other jurisdictions.
6. 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'.
7. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.

Source: AIHW analysis of NPDC.

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

Clinical commentary

Women who smoke tobacco during pregnancy are more likely to experience pre-term birth, placental complications and perinatal death of their baby (WHO 2013).

Babies of mothers who smoke during pregnancy are at increased risk of poor growth during pregnancy, particularly during the phase of rapid weight gain from 34 weeks of gestation onwards (Sirvinskiene et al. 2016). Sudden infant death syndrome, childhood diabetes and childhood obesity have been linked with exposure to tobacco during fetal development (Banderali et al. 2015; Flenady et al. 2018). Maternal smoking is associated with low birthweight, which in turn is associated with poor educational outcomes in early childhood, coronary heart disease, type 2 diabetes, and being overweight in adulthood (Guthridge et al. 2015; Lumley et al. 2009).

Smoking cessation during pregnancy is key in reducing the risk of complications during pregnancy and birth as well as reducing adverse health outcomes for the baby. Cessation at later stages of pregnancy will still improve health outcomes for the baby, including improved fetal growth (AIHW 2021; Miyazaki et al. 2015).

There are clear associations between smoking in pregnancy, age of the mother, remoteness of residence and disadvantage quintile evident in the results presented. Varying sociodemographic profiles of women who give birth in public and private hospitals needs to be taken into account when considering the higher rates of smoking in pregnancy for women giving birth in public hospitals.

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information, refer to [Specifications and notes for analysis](#) in the technical notes.

References

AIHW (Australian Institute of Health and Welfare) (2021) *Stillbirths and neonatal deaths in Australia 2017-2018*, AIHW, Australian Government, accessed 9 May 2023

Banderali G, Martelli A, Landi M, Moretti F, Betti F, Radaelli G, Lassandro C and Verduci E (2015) 'Short and long term health effects of parental tobacco smoking during pregnancy and lactation: a descriptive review', *Journal of Translational Medicine*, 13:327, doi:10.1186/s12967-015-0690-y.

Flenady V, Wojciezek AM and Middleton P (2018) 'Stillbirths: recall to action in high-income countries', *Lancet*, 387(10019):691-702, doi:10.1016/S0140-6736(15)01020-X.

Guthridge S, Li L, Silburn S, Li SQ, McKenzie J and Lynch J (2015) 'Impact of perinatal health and socio-demographic factors on school education outcomes: A population study of Indigenous and non-Indigenous children in the Northern Territory' *Journal of Paediatrics and Child Health*, 51(8):778-86, doi:10.1111/jpc.12852.

Lumley J, Chamberlain C, Dowsell T, Oliver S, Oakley L and Watson L (2009) 'Interventions for promoting smoking cessation during pregnancy' *Cochrane Database of Systematic Reviews*, (3):CD001055, doi:10.1002/14651858.CD001055.pub3.

Miyazaki Y, Hayashi K and Imazeki S (2015) 'Smoking cessation in pregnancy: psychosocial interventions and patient focused perspectives' *International Journal of Women's Health*, 7:415-427, doi:10.2147/IJWH.S54599.

Sirvinskiene G, Zemaitiene N, Jusiene R, Smigelskas K, Veryga A and Markuniene E (2016) 'Smoking during pregnancy in association with maternal emotional well-being' *Medicina*, 52(2):132-138, doi:10.1016/j.medic.2016.02.003.

WHO (World Health Organization) (2013) *WHO recommendations for the prevention and management of tobacco use and second-hand smoke exposure in pregnancy*, accessed 30 September 2021.

Antenatal period indicators

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. For more information, see [Clinical commentary](#).

This indicator examines antenatal care visits in the first trimester (before 14 weeks gestational age) and in the first 10 weeks for all women giving birth. It does not include visits where the sole purpose is to confirm the pregnancy.

Key findings

- Around 4 in 5 women (80%) giving birth in 2021 had an antenatal care visit in their first trimester and around 3 in 5 (61%) had an antenatal care visit within the first 10 weeks of pregnancy.
- The proportion of women having an antenatal care visit in the first trimester of pregnancy and in the first 10 weeks of pregnancy have both increased over time (from 66% in 2011 to 80% in 2021, and 38% in 2011 to 61% in 2021, respectively).

The proportion of women who had an antenatal care visit in the first trimester of pregnancy:

- was higher for women in their 30s (around 81% in 2021) compared to those younger than 20 (68% in 2021)
- was higher for women living in *Major cities* (79%), *Inner regional* (83%), or *Outer regional* (81%) areas than those living in *Remote* (73%) or *Very remote* (68%) areas in 2021
- was lower for women living in areas of most disadvantage (77% in 2021) compared with other areas.

The interactive data visualisation (Figure 5) presents data on antenatal care for all women giving birth in the first 10 weeks of pregnancy and in the first trimester by selected maternal characteristics. Select the trend button to see how data have changed between 2011 and 2021.

Figure 5: Antenatal care in the first trimester

Antenatal care in the first trimester for all women giving birth, 2011 to 2021.

This chart shows the proportion of women giving birth who received antenatal care in the first trimester (before 14 weeks gestation), for the current data 2021 and trend data from 2011 to 2021. The proportion for all Australian mothers increased from 66% in 2011 to 80% in 2021.

The chart also shows the proportion of women giving birth who had their first antenatal visit within the first 10 weeks of pregnancy. The proportion has increased from 38% in 2011 to 61% in 2021.

Antenatal care in the first trimester for all women giving birth by state/territory of birth, 2021

Select indicator

Antenatal care in the first trimester for all women giving birth

View data by

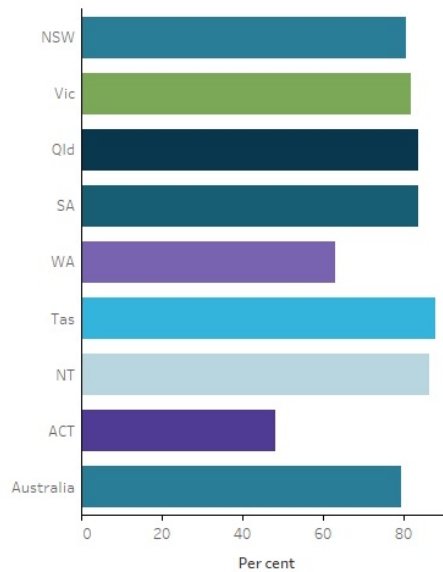
State/territory of birth



Trend data



Data tables



Notes:

1. Records with missing or invalid data for gestational age at first antenatal visit were removed from the denominator. The valid range for gestational age is 3–46 weeks.
2. Because of some jurisdictional differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
3. For ACT, first antenatal visit is often the first hospital antenatal clinic visit, scheduled for around 16–18 weeks of pregnancy. In many cases, earlier antenatal care provided by the woman's general practitioner is not reported.
4. 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.
5. 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'.
6. There was a documented change in collection practice in NSW in 2011 for data for gestational age at first antenatal care visit. Comparison of 2011 data to later years of data should be made with caution.
7. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.

Source: AIHW analysis of NPDC.

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

Clinical commentary

Antenatal care is a system of regular assessments by a midwife or doctor throughout the course of the pregnancy that provides the opportunity to promote healthy lifestyles, screen for and - if necessary - treat health problems to benefit both mother and baby (WHO 2016). Commencing regular antenatal care in the first trimester (before 14 weeks of gestation) is associated with better maternal health in pregnancy, fewer interventions in late pregnancy and positive child health outcomes (AIHW 2023; DoH 2020). The Australian Pregnancy Care Guidelines (DoH 2020) recommend that a woman has her first antenatal visit within the first 10 weeks of pregnancy.

The first contact with a woman in the antenatal period may be when she attends primary care, usually a general practitioner (GP), to confirm the pregnancy. Women will either start antenatal care at that point or be referred to a maternity care provider or service; for example, a midwife, obstetrician, GP, or Aboriginal health service (DoH 2020).

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

AIHW (Australian Institute of Health and Welfare) (2023) *Australia's mothers and babies*, AIHW, Australian Government, accessed 29 June 2023.

DoH (Department of Health) (2020) *Clinical Practice Guidelines: Pregnancy Care 2020 Edition*, Department of Health, Australian Government, accessed 20 March 2023.

WHO (World Health Organization) (2016) *WHO recommendations on antenatal care for a positive pregnancy experience*, WHO, Geneva, accessed 23 April 2021.



Labour and birth indicators

The National Core Maternity Indicators (NCMIs) associated with labour and birth present information on measures of clinical activity and outcomes between 2004 and 2021. This section examines key measures related to labour and birth for selected women and for all women.

Data for these indicators are presented by jurisdiction of birth, hospital annual number of births, and hospital sector. Some indicators are presented by mother's age at birth, mother's First Nations status, remoteness of mother's usual residence, disadvantage quintile of mother's usual residence, and other data groupings where relevant.

Selected women

Selected women are those who are giving birth for the first time and meet all the following criteria:

- 20 to 34 years of age at the time of giving birth
- gave birth at term (gestational age at birth between 37 and 40 completed weeks)
- pregnancy had one baby only (singleton pregnancy)
- baby's head was at the cervix (vertex presentation).

Comparison of 'selected' groups of women allows for an indication of standard practice. Selected women, for this indicator, refers to a cohort of mothers who are expected to have reduced labour complications and better birth outcomes. However, this cohort may include women with other medical and obstetric complications such as hypertensive disorders, diabetes, and obesity. The proportion of selected women is approximately one-quarter (26%) of all women who gave birth in 2021.

During labour and birth

Four labour and birth indicators are presented in this report for selected women giving birth for the first time and a further 3 are presented for all women giving birth. Table 2 shows the proportion of women for the current year (2021) and the baseline year for each indicator, enabling comparison between these 2 points in time.

Table 2: Labour and birth indicators by proportion for baseline year and 2021

Indicator number	Indicator	Baseline year	Baseline year (%)	Current year 2021 (%)
Selected women				
PI 05	Induction of labour for selected women giving birth for the first time	2004	25.9	44.1
PI 06	Caesarean section for selected women giving birth for the first time	2004	24.5	33.4
PI 07	Non-instrumental vaginal birth for selected women giving birth for the first time	2004	53.0	42.3
PI 08	Instrumental vaginal birth for selected women giving birth for the first time	2004	22.6	24.3
All women				
PI 03a	Episiotomy for women having their first baby and giving birth vaginally without instruments to assist the birth	2004	16.2	23.0
PI 03b	Episiotomy for women having their first baby and giving birth vaginally assisted with instruments	2004	60.7	81.1
PI 09	General anaesthetic for women giving birth by caesarean section	2007	8.2	5.3
PI 15	Women having their second birth vaginally whose first birth was by caesarean section	2007	13.3	11.5

Labour and birth indicators

Induction is an intervention to stimulate the onset of labour. It 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). For more information, see [Clinical commentary](#).

This indicator looks at induction of labour for [selected women](#) giving birth for the first time.

Key findings

In 2021, 44% of selected women giving birth for the first time had an induced labour.

The proportion of selected women giving birth for the first time who had induced labour:

- increased from 26% in 2004 to 44% in 2021, with most of the increase occurring over the last decade
- was slightly higher in public hospitals (46% in 2021) compared with private hospitals (43% in 2021) since 2016
- was lowest in the ACT and Queensland (39%) in 2021.

The interactive data visualisation (Figure 6) presents data on induction of labour in selected women giving birth for the first time by selected maternal characteristics. Select the trend button to see how data have changed between 2004 and 2021.

Figure 6: Induction of labour

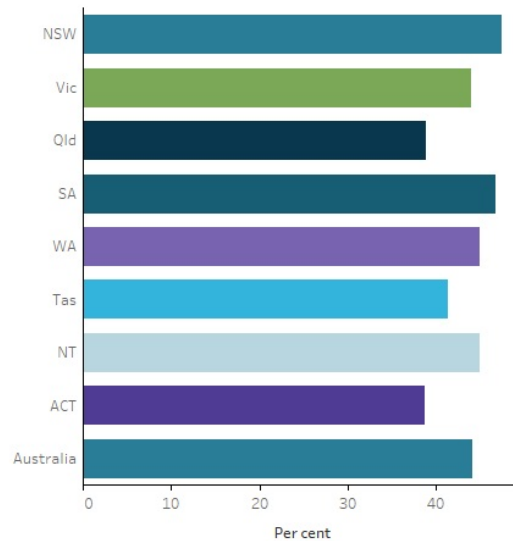
Induction of labour for selected women giving birth for the first time, 2004 to 2021.

This chart shows the proportion of induced labour for selected women giving birth for the first time, for the current data 2021 and trend data from 2004 to 2021. The proportion for selected women induced in giving birth for the first time increased from 26% in 2004 to 44% in 2021.

Induction of labour for selected women giving birth for the first time by state/territory of birth, 2021

Data tables

44%
of selected women giving birth for the first time had an induced labour (35,517 of 80,466 births in 2021)



Notes:

1. 'Induced' may include cases where induction of labour was attempted but labour did not result.
2. In 2022, the selected females criteria were updated to revise gestational age at birth range, for more information please see the METEOR specification. Data for all years have been updated to reflect this change. Data are not comparable to data in previously published reports. Consequential suppression to prevent back-calculation of small numbers may have been applied as a result of this change.
3. Data for selected women criteria, parity, were not available from Victoria for 2009, therefore any interpretation of 2009 national data or comparisons with other years should be made with caution.
4. Data for Tasmania from 2004–2012 were not available due to incomplete information for the 'selected women' cohort. For this period, presentations via caesarean births were not reported by hospitals still using paper-based forms. Interpretations of data for this period or comparisons with later years should be made with caution.
5. 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'.
6. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.
7. n.a. Data were not available for measurement calculation.

Source: AIHW analysis of NPDC.
<https://www.aihw.gov.au>

Clinical commentary

When induction of labour is indicated on medical grounds, it is undertaken when the risks of continuing the pregnancy are greater than the risks associated with being born (McDonnell 2011). For the woman to make a fully informed decision, clear information should be given regarding the risks of continuing the pregnancy and awaiting the spontaneous onset of labour versus the risks of the intervention of induction.

Maternal factors such as wellbeing, cervical assessment, parity and previous mode of delivery, and fetal factors such as gestational age, growth and wellbeing of the fetus need to be considered when deciding whether labour should be induced (McCarthy and Kenny 2013). These factors also assist in determining the method of induction, which can be surgical (including artificial rupture of membranes) and/or medical (including use of prostaglandins and/or oxytocin) (RANZCOG 2021; Queensland Health 2017).

There are numerous indications for induction of labour. Prolonged pregnancy is the most common indication, with births after 42 weeks associated with increased risk for the baby and perinatal death (Gulmezoglu et al. 2012). It is widely recommended that induction be offered to women at 41–42 weeks of gestation (Gulmezoglu et al. 2012; NICE 2008; Queensland Health 2017).

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).

Indicator specifications and data

Excel source data tables are available from the [Data](#) page.

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

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.

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Queensland Health (2017) *Queensland Maternity and Neonatal Clinical Guidelines Program 2017*, Queensland maternity and neonatal clinical guideline: induction of labour. Brisbane: Queensland Health.

RANZCOG (Royal Australian and New Zealand College of Obstetricians and Gynaecologists) (2021) *Induction of labour*, accessed 17 August 2022.



Labour and birth indicators

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. For more information, see [Clinical commentary](#).

This indicator looks at caesarean section for [selected women](#) giving birth for the first time.

Key findings

In 2021, one third (33%) of selected women giving birth for the first time had a caesarean section.

The proportion of selected women giving birth for the first time having a caesarean section birth:

- increased from 1 in 4 women (25%) in 2004, to 1 in 3 (33%) in 2021
- was higher in private hospitals than in public hospitals (43% compared with 29% in 2021)
- was slightly higher for women living in areas of least disadvantage (35% in 2021) than for women living in areas of most disadvantage (32% in 2021).

The interactive data visualisation (Figure 7) presents data on caesarean section for selected women giving birth for the first time by selected maternal characteristics. Select the trend button to see how data have changed between 2004 and 2021.

Figure 7: Caesarean section

Caesarean section for selected women giving birth for the first time, 2004 to 2021.

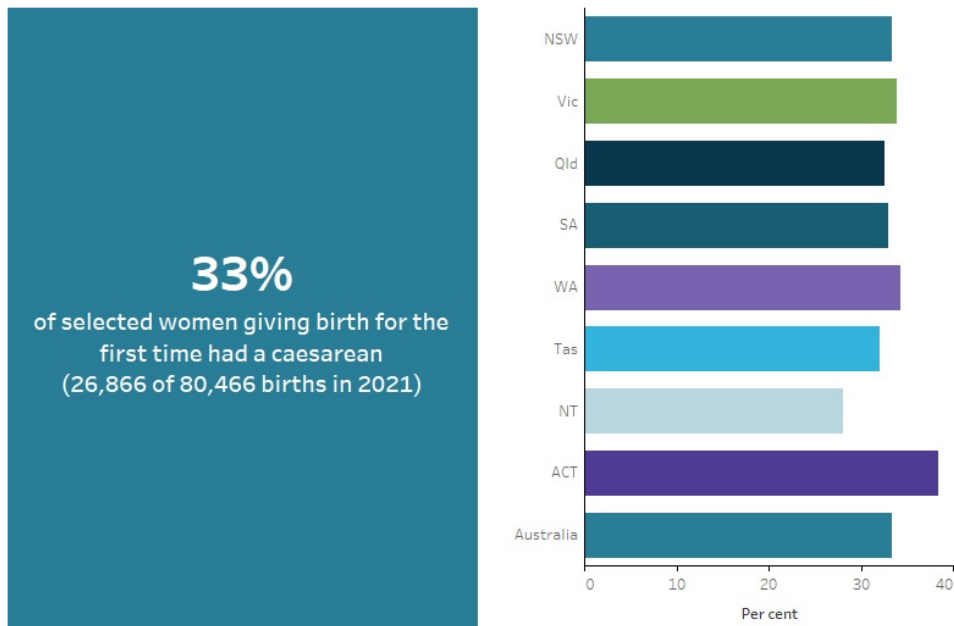
This chart shows the proportion of women receiving a caesarean section for selected women giving birth for the first time, for the current data 2021 and trend data from 2011 to 2021. The proportion for selected women giving birth for the first time receiving a caesarean section increased from 25% in 2004 to 33% in 2021.

Caesarean section for selected women giving birth for the first time by state/territory of birth, 2021

View data by
State/territory of birth

 Trend data

 Data tables



Notes:

1. In 2022, the selected females criteria were updated to revise gestational age at birth range, for more information please see the METEOR specification. Data for all years have been updated to reflect this change. Data are not comparable to data in previously published reports. Consequential suppression to prevent back-calculation of small numbers may have been applied as a result of this change.
2. Data for selected women criteria, parity, were not available from Victoria for 2009, therefore any interpretation of 2009 national data or comparisons with other years should be made with caution.
3. Data for Tasmania from 2004–2012 were not available due to incomplete information for the 'selected women' cohort. For this period, presentations via caesarean births were not reported by hospitals still using paper-based forms. Interpretations of data for this period or comparisons with later years should be made with caution.
4. 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'.
5. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.
6. n.a. Data were not available for measurement calculation.

Source: AIHW analysis of NPDC.
<https://www.aihw.gov.au>

Clinical commentary

A caesarean section is an operation where a baby is born through an incision made through the mother's abdomen and the uterus (RANZCOG 2021). A caesarean section may be planned (elective), or unplanned (emergency) if complications develop and delivery needs to be hastened.

Caesarean section is one of the most common interventions in pregnancy and is safer now than in the past, however, a small risk of serious morbidity and mortality for both the mother and the baby remains and the benefits need to be weighed against the risks (ACSQHC 2018; Betran et al. 2016; Villar et al. 2007; Keag et al. 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).

Caesarean section rates have increased steadily worldwide over the last decades (WHO 2018, OECD 2019) however this trend has not been associated with significant maternal or perinatal benefits (WHO 2015). Caesarean section rates have increased across most OECD countries, from an average of 20% in 2000 to 28% in 2017. In 2021, 38% of *all women* giving birth in Australia had a caesarean section (AIHW 2023). The WHO states that at the population-level, caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates (WHO 2015). The WHO also states that caesarean sections are effective at saving lives when required for medically indicated reasons, and every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate (WHO 2015). The increasing rates of caesarean sections may be influenced by a number of maternal and clinical factors and medico legal concerns, however, the reasons for the steep rise remain unexplained. Besides this general increase in caesarean section, a large variation between countries, regions and hospitals has been documented (OECD 2019, Betran et al. 2016; Bragg et al. 2010; Librero et al. 2000).

Whether the operation is a planned elective procedure or an unplanned emergency procedure, receiving clear information on the benefits of the operation and the short and long-term risks is important to enable an informed decision as to whether to proceed with the caesarean section or not.

More information on caesarean section for all women giving birth can be found in [Australia's mothers and babies](#).

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

ACSQHC (Australian Commission on Safety and Quality in Health Care) (2018) *The second Australian atlas of healthcare variation*, accessed 2 March 2023.

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WHO (World Health Organization) (2018) *WHO recommendations: non-clinical interventions to reduce unnecessary caesarean sections*, WHO, Geneva, accessed 20 March 2023.



Labour and birth indicators

Women who have a vaginal birth without intervention tend to have fewer postnatal complications and are more physically able in the short-term to care for their new babies (Rowland and Redshaw 2012). For more information, see [Clinical commentary](#).

This indicator looks at non-instrumental vaginal births for [selected women](#) giving birth for the first time.

Key findings

Around 2 in 5 (42%) selected women giving birth for the first time in 2021 had a non-instrumental vaginal birth.

The proportion of selected women giving birth for the first time having a non-instrumental vaginal birth:

- decreased from 53% in 2004 to 42% in 2021
- was higher in public hospitals than in private hospitals (46% compared with 30% in 2021)
- was higher for women living in areas of most disadvantage (46%) compared with women living in areas of least disadvantage (38%) in 2021
- was lowest for women living in *Major cities* (41% in 2021) compared with other remoteness areas.

The interactive data visualisation (Figure 8) presents data on unassisted vaginal birth for selected women giving birth for the first time by selected maternal characteristics. Select the trend button to see how data have changed between 2004 and 2021.

Figure 8: Non-instrumental vaginal birth

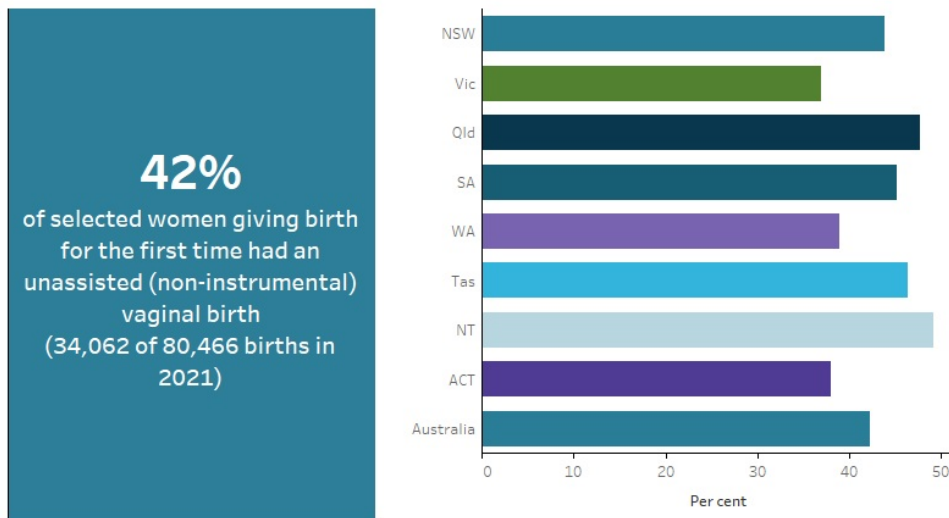
Non-instrumental vaginal birth for selected women giving birth for the first time, 2004 to 2021.

This chart shows the proportion of women having a non-instrumental vaginal birth for selected women giving birth for the first time, for the current data 2021 and trend data from 2004 to 2021. The proportion for selected women having a non-instrumental vaginal birth for selected women giving birth for the first time decreased from 53% in 2004 to 42% in 2021.

Unassisted (non-instrumental) vaginal birth for selected women giving birth for the first time by state/territory of birth, 2021

View data by
State/territory of birth

 Trend data  Data tables



Notes:

1. From 2004 to 2006, non-instrumental vaginal births included 'Spontaneous vaginal' or 'Vaginal breech' births. From 2007 onwards, non-instrumental vaginal births included 'Vaginal—non-instrumental' births. Data prior to 2007 should be interpreted with caution.
2. In 2022, the selected females criteria were updated to revise gestational age at birth range, for more information please see the METEOR specification. Data for all years have been updated to reflect this change. Data are not comparable to data in previously published reports. Consequential suppression to prevent back-calculation of small numbers may have been applied as a result of this change.
3. Data for selected women criteria, parity, were not available from Victoria for 2009, therefore any interpretation of 2009 national data or comparisons with other years should be made with caution.
4. Data for Tasmania from 2004–2012 were not available due to incomplete information for the 'selected women' cohort. For this period, presentations via caesarean births were not reported by hospitals still using paper-based forms. Interpretations of data for this period or comparisons with later years should be made with caution.
5. 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.
6. 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'.
7. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.
8. n.a. Data were not available for measurement calculation.

Source: AIHW analysis of NPDC.
<https://www.aihw.gov.au>

Clinical commentary

A vaginal birth may be the safest option for women with uncomplicated pregnancy or labour. A vaginal birth can result in shorter hospital stays and a faster recovery for birthing mothers (Raising Children Network 2023). Maternal risks associated with vaginal birth may include perineal tears, damage to the pelvic floor, pelvic organ prolapse, and persistent perineal or vulvar pain (Raising Children Network 2023, van Roosmalen and Meguid 2014). Potential neonatal risks related to vaginal births include shoulder dystocia, hypoxia during labour and birth injuries (Raising Children Network 2023, Hannah et al. 2000).

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

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- Raising Children Network (Australia) (2023) *Vaginal birth: guide for birthing mothers*, Raising Children Network, accessed 20 March 2023.
- Rowland I and Redshaw M (2012) 'Mode of birth and women's psychological and physical wellbeing in the postnatal period', *BMC Pregnancy and Childbirth*, 12:138, doi:10.1186/1471-2393-12-138.
- van Roosmalen J and Meguid T (2014) 'The dilemma of vaginal breech delivery worldwide', *Lancet*, 383:1863-1864, doi:10.1016/S0140-6736(14)60618-8.



Labour and birth indicators

The use of instruments - vacuum extraction cup or forceps - may be required to achieve a safe vaginal birth. Using instruments to assist birth is usually recommended when the condition of either the baby or the mother requires a hastened delivery (RANZCOG 2020). For more information, see [Clinical commentary](#).

This indicator looks at instrumental vaginal births for [selected women](#) giving birth for the first time.

Key findings

In 2021, around 1 in 4 (24%) selected women giving birth for the first time had an instrumental vaginal birth.

The proportion of selected women giving birth for the first time having an instrumental vaginal birth:

- increased slightly from 2004 (23%) to 2021 (24%)
- was highest for women living in *Major cities* (25%) compared with other remoteness areas in 2021
- was slightly higher in private hospitals (25%) than public hospitals (24%), a difference that has been decreasing over time
- was higher for women living in areas of least disadvantage compared with women living in areas of most disadvantage (26% compared with 22% in 2021).

The interactive data visualisation (Figure 9) presents data on assisted (instrumental) vaginal birth for selected women giving birth for the first time by selected maternal characteristics. Select the trend button to see how data have changed between 2004 and 2021.

Figure 9: Instrumental vaginal birth

Assisted (Instrumental) vaginal birth for selected women giving birth for the first time, 2004 to 2021.

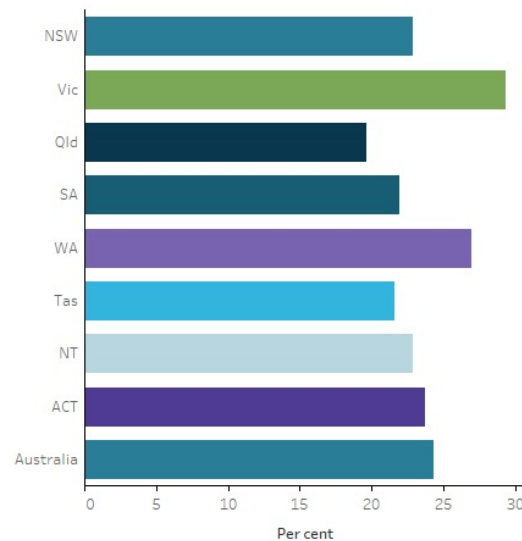
This chart shows the proportion of women having an assisted (instrumental) vaginal birth for selected women giving birth for the first time, for the current data 2021 and trend data from 2004 to 2021. The proportion of selected women having an assisted vaginal birth when giving birth for the first time increased from 23% in 2004 to 24% in 2021.

Assisted (instrumental) vaginal birth for selected women giving birth for the first time by state/territory of birth, 2021

View data by
State/territory of birth

 Trend data  Data tables

24%
of selected women giving birth for the first time had an assisted (instrumental) vaginal birth (19,538 of 80,466 births in 2021)



Notes:

1. Instrumental vaginal births include forceps and vacuum extraction.
2. In 2022, the selected females criteria were updated to revise gestational age at birth range, for more information please see the METEOR specification. Data for all years have been updated to reflect this change. Data are not comparable to data in previously published reports. Consequential suppression to prevent back-calculation of small numbers may have been applied as a result of this change.
3. Data for selected women criteria, parity, were not available from Victoria for 2009, therefore any interpretation of 2009 national data or comparisons with other years should be made with caution.
4. Data for Tasmania from 2004–2012 were not available due to incomplete information for the 'selected women' cohort. For this period, presentations via caesarean births were not reported by hospitals still using paper-based forms. Interpretations of data for this period or comparisons with later years should be made with caution.
5. 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.
6. 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'.
7. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.
8. n.a. Data were not available for measurement calculation.

Source: AIHW analysis of NPDC.
<https://www.aihw.gov.au>

Clinical commentary

Instrumental delivery is employed to accelerate birth in the presence of suspected or anticipated fetal compromise, delay in the second stage of labour or when maternal pushing efforts may make blood pressure or heart problems worse (RANZCOG 2020). Both vacuum and forceps assisted delivery are associated with an increased risk of injury to the tissues of the vagina, perineum and anus. This may lead to long-term perineal pain and sexual difficulties; additionally, a very small number may have urinary or faecal incontinence (RANZCOG 2020; RCOG 2020). Specialist colleges of obstetrics and gynaecology recommend that episiotomy is used selectively, rather than routinely, in association with vacuum and forceps assistance to minimise that risk (RANZCOG 2020; RCOG 2020).

Although the overall rate of injury to the baby because of instrumental vaginal delivery is low, there is a risk of certain complications, including injuries to the baby's scalp, head, and eyes; bleeding inside the skull; and problems with the nerves located in the arm and face (RCOG 2020). The choice of which instrument to use depends on the clinical situation, and the principles of informed consent require that the woman is provided with information regarding these risks and the proposed benefits of the procedure prior to embarking on assisted vaginal birth.

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

RANZCOG (The Royal Australian and New Zealand College of Obstetricians and Gynaecologists) (2020) *Obstetrics Intrapartum care, labour and birth: Instrumental vaginal birth (C-Obs 16)*, accessed 6 October 2021.



Labour and birth indicators

An episiotomy is an incision made in the perineum (the tissue between the vaginal opening and the anus) and vagina to enlarge the vaginal opening (RCOG 2015). This indicator examines the frequency of episiotomy for women having their first baby and giving birth vaginally, either with or without the assistance of instruments. For more information, see [Clinical commentary](#).

Key findings

- In 2021, nearly one quarter of women (23%) giving birth for the first time received an episiotomy in a non-instrumental vaginal birth.
- In 2021, around 4 in 5 women (81%) giving birth for the first time received an episiotomy in an instrumental vaginal birth.
- The proportion of women giving birth for the first time receiving an episiotomy has increased from 16% in 2004 to 23% in 2021 for non-instrumental vaginal births.
- The proportion of women giving birth for the first time receiving an episiotomy has increased from 61% in 2004 to 81% in 2021 for instrumental vaginal births.

The interactive data visualisation (Figure 10) presents data on episiotomy for women having their first baby and giving birth vaginally assisted, by selected maternal characteristics. Select the trend button to see how data have changed between 2004 and 2021.

Figure 10: Episiotomy

Episiotomy for women having their first baby and giving birth vaginally (instrumental), 2004 to 2021.

This chart shows the proportion of women having their first baby with an episiotomy and giving birth vaginally assisted (with instruments), for the current data 2021 and trend data from 2004 to 2021. The proportion of women giving birth for the first time, vaginally assisted (with instruments) who had an episiotomy increased from 61% in 2004 to 81% in 2021. The chart also shows the proportion of women giving birth for the first time, vaginally without the use of instruments who had an episiotomy. This has increased from 16% in 2004 to 23% in 2021.

Episiotomy for women having their first baby and giving birth vaginally assisted (instrumental) by state/territory of birth, 2021

Select indicator

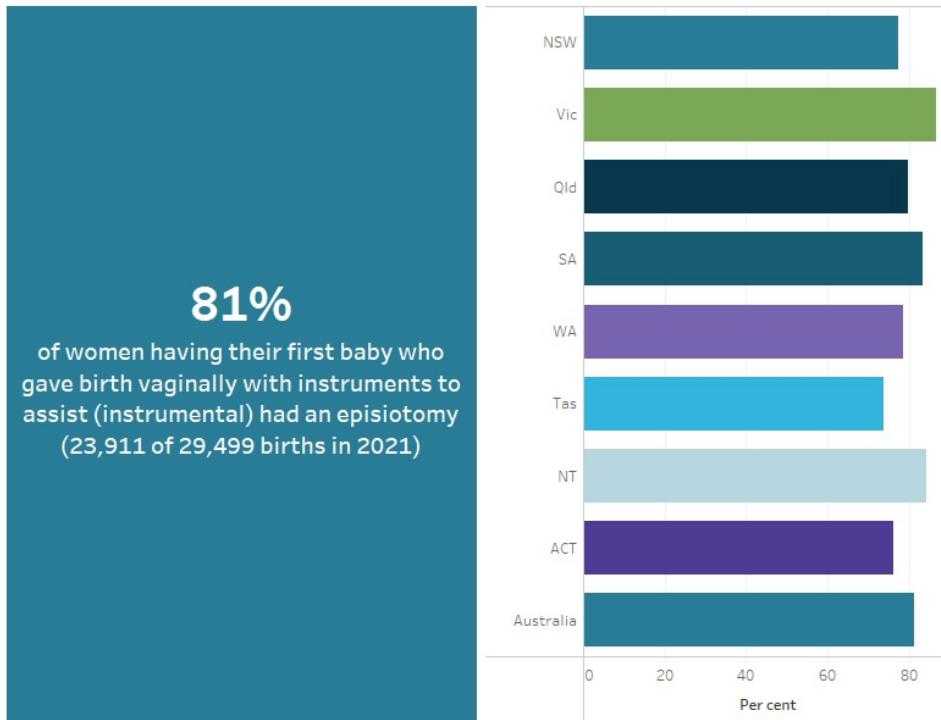
Episiotomy for women having their first baby and giving birth vaginally assi..

View data by

State/territory of birth

Trend data

Data tables



Notes:

1. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
2. For multiple births, the perineal status after the birth of the first-born baby was used.
3. Data from Victoria were not available for 2009, therefore any interpretation of 2009 national data or comparisons with other years should be made with caution.
4. From 2004 to 2006, non-instrumental vaginal births included 'Spontaneous vaginal' or 'Vaginal breech' births. From 2007 onwards, non-instrumental vaginal births included 'Vaginal—non-instrumental' births. Data prior to 2007 should be interpreted with caution.
5. n.a. Data were not available for measurement calculation.

Source: AIHW analysis of NPDC.

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

Clinical commentary

Episiotomy can shorten the second stage of labour, but the consequences of the trauma to the perineum and, potentially to the anus and rectum, need to be balanced against the need for episiotomy. The possible use of episiotomy during a vaginal birth must be discussed prospectively with the woman (ACSQHC 2021).

Evidence suggests that selective use of episiotomy is better practice than routine use of episiotomy and may reduce the level of pain, urinary incontinence, painful sex or severe perineal trauma (Jiang et al. 2017).

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

ACSQHC (Australian commission on Safety and Quality in Health Care) (2021) *Third and fourth degree perineal tears clinical care standard (2021)*, accessed 17 August 2022.

Jiang H, Qian X, Carroli G and Garner P (2017) 'Selected versus routine use of episiotomy for vaginal birth', *Cochrane Database of Systematic Reviews*, 2: CD000081, doi:10.1002/14651858.CD000081.pub3.

Labour and birth indicators

Anaesthesia is used to relieve pain during a caesarean section, with almost all women who have a caesarean section receiving some type of anaesthesia. General anaesthetic is one method of administering anaesthesia for caesarean section and is most commonly indicated when the operation is urgent or when regional anaesthetics are contra-indicated or have failed amongst other factors. For more information, see [Clinical commentary](#).

This indicator examines the proportion of women who received a general anaesthetic when giving birth by caesarean section.

Key findings

In 2021, around 1 in 20 (5.3%) women who had a caesarean section birth received a general anaesthetic.

The proportion of women receiving a general anaesthetic when giving birth by caesarean section:

- has decreased from 8.2% in 2007 to 5.3% in 2021
- was highest for women younger than 20 (17% in 2021) compared with other age groups
- was higher for women living in the most socioeconomically disadvantaged areas than for women living in the least disadvantaged areas
- was higher for women giving birth in a public hospital than for women giving birth in a private hospital (6.8% compared with 2.1% in 2021).

The interactive data visualisation (Figure 11) presents data for women who had a general anaesthetic when giving birth by caesarean section by selected maternal characteristics. Select the trend button to see how data have changed between 2007 and 2021.

Figure 11: General anaesthetic for women giving birth by caesarean section

General anaesthetic for women giving birth by caesarean section, 2007 to 2021.

This chart shows the proportion of women having a general anaesthetic giving birth by caesarean section for the current data 2021 and trend data from 2007 to 2021. The proportion of women receiving a general anaesthetic giving birth by caesarean section for all Australia decreased from 8.2% in 2007 to 5.3% in 2021.

General anaesthetic for women giving birth by caesarean section by state/territory of birth, 2021

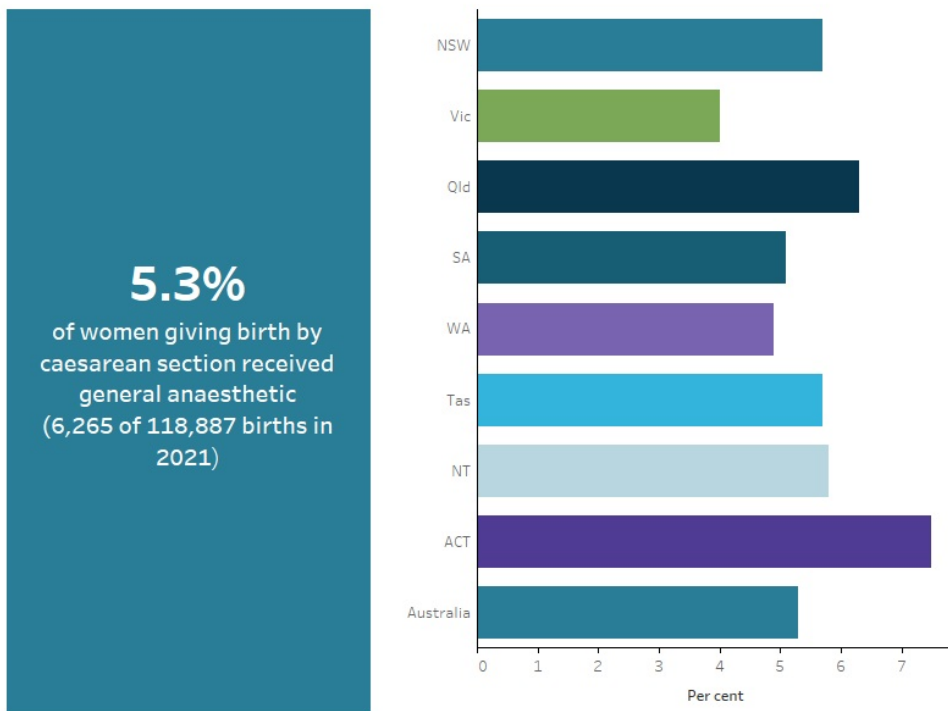
View data by
State/territory of birth



Trend data



Data tables



Notes:

1. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
2. Data were not available for Victoria in 2009. Data for Victoria in 2010 were excluded due to a high proportion of not stated data. Any interpretation of 2009–2010 national data or comparisons with other years should be made with caution.
3. 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'.
4. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.
5. n.a. Data were not available for measurement calculation.

Source: AIHW analysis of NPDC.
<https://www.aihw.gov.au>

Clinical commentary

Regional anaesthesia (or epidural) is the most common method of providing anaesthesia for caesarean section (96%) (AIHW 2023). Regional anaesthesia is safer for mother and baby than general anaesthesia (NICE 2021). When general anaesthesia is used, the most common indications are urgency, maternal refusal of regional techniques, inadequate or failed regional attempts, and regional contraindications including coagulation or spinal abnormalities (Shroff et al. 2004). Obstetric indications, such as placenta praevia, were considered absolute indications for general anaesthesia however, there are now indications that general anaesthesia may not be the only option (McGlennan and Mustafa 2009).

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

AIHW (Australian Institute of Health and Welfare) (2023) *Australia's mothers and babies*, AIHW, Australian Government, accessed 29 June 2023.

NICE (National Institute for Health and Care Excellence) (2021) *Caesarean birth: NICE guideline 192*, NICE, Manchester, accessed 11 October 2021.

McGlennan A and Mustafa A (2009) 'General anaesthetic for caesarean section' *Continuing Education in Anaesthesia Critical Care & Pain*, 9(5):148-151, doi:10.1093/bjaceaccp/mkp025.

Shroff R, Thompson A, McCrum A and Rees S (2004) 'Prospective multidisciplinary audit of obstetric general anaesthesia in a district general hospital', *Journal of Obstetrics and Gynaecology*, 6:641-646, doi:10.1080/01443610400007877.

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Labour and birth indicators

Caesarean section in a first pregnancy makes a second birth by caesarean section more likely. Repeat caesarean section and vaginal birth for women with a previous history of caesarean section each have associated risks and benefits. For more information, see [Clinical commentary](#).

This indicator examines women having their second birth vaginally whose first birth was by caesarean section (VBAC).

Key findings

In 2021, around 1 in 8 women (12%) had their second birth vaginally after having their first birth by caesarean section.

The proportion of women having their second birth vaginally after having their first birth by caesarean section:

- has decreased slightly from 13% in 2007 to 12% in 2021
- was higher in public hospitals than private hospitals (14% and 5.4% respectively in 2021)
- generally decreased with age, with the rate in women aged 20-24 (19%) nearly three and a half times as high as in women aged 40 and over (5.6%).

The interactive data visualisation (Figure 12) presents data for women who had a second birth vaginally whose first birth was by caesarean section by selected maternal characteristics. Select the trend button to see how data have changed between 2007 and 2021.

Figure 12: Women having their second birth vaginally whose first birth was by caesarean section

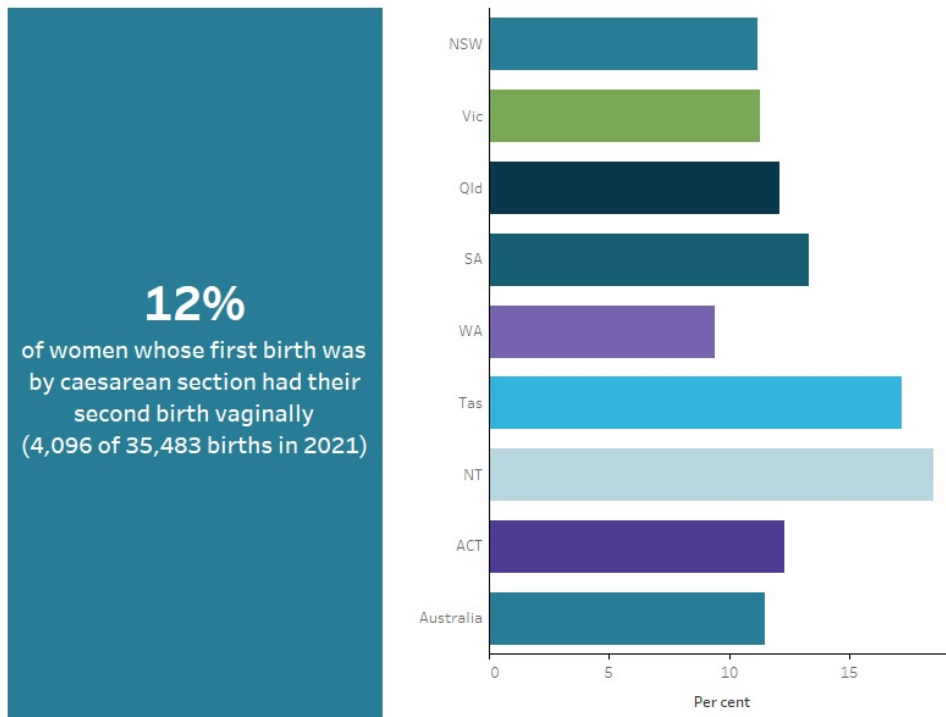
Women having their second birth vaginally whose first birth was by caesarean section, 2007 to 2021.

This chart shows the proportion of women having their second birth vaginally whose first birth was by caesarean section, for the current data 2021 and trend data from 2007 to 2021. The proportion of women having their second birth vaginally whose first birth was by caesarean section for all Australia varied from 13% in 2007, peaking at 14% in 2010, before stabilising at around 12% from 2017 to 2021.

Women having their second birth vaginally whose first birth was by caesarean section by state/territory of birth, 2021

View data by
State/territory of birth

 Trend data  Data tables



Notes:

1. Only includes women whose second birth was a singleton birth.
2. Data for Victoria in 2007 to 2009 were not available, therefore any interpretation of 2007-2009 national data or comparisons with other years should be made with caution.
3. Data for Western Australia not published for 2013 as only half a year of data was reported for that year.
4. 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'.
5. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.
6. From 2014, Caesarean section at most recent previous birth indicator data item was introduced into the Perinatal NMDS. Prior to this, a voluntary standard existed for the data item, Caesarean section indicator (last previous birth).
7. n.a. Data were not available for measurement calculation.

Source: AIHW analysis of NPDC.
<https://www.aihw.gov.au>

Clinical commentary

For women who have had a previous caesarean section, the choice for method of birth in their next pregnancy is either a trial of vaginal birth after caesarean section (VBAC) or a repeat caesarean section (RCS).

Caesarean section in a first pregnancy makes a subsequent caesarean section more likely, with 87% of women with a history of one or more previous caesarean section births, having a subsequent caesarean section (AIHW 2023). However, many women who choose to give birth vaginally after having had a previous caesarean section are successful (RANZCOG 2019).

Both RCS and VBAC are associated with benefits and risks. A successful VBAC can include a higher likelihood of an uncomplicated normal birth in future pregnancies, a shorter recovery and hospital stay, reduced abdominal pain after birth and lower risk of respiratory problems for the baby. Additional risks for the mother and baby when attempting a VBAC can include a chance of an emergency caesarean during labour, uterine scar rupture (5 to 7 out of 1000 attempts) which can result in serious problems for both the baby and mother and a low risk (2 in 1000 women) of the baby dying or having brain damage. The risks associated with a RCS includes those associated with any major surgery and the increased likelihood that all future births will be by caesarean section (RANZCOG 2016).

An individual woman's preferences and risk profile will vary. Choice of birth option is best informed by discussion with maternity care clinicians with consideration of medical history, previous pregnancies, and availability of suitably qualified and trained staff and an appropriately equipped maternity unit (RANZCOG 2016).

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

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AIHW (Australian Institute of Health and Welfare) (2023) *Australia's mothers and babies*, AIHW, Australian Government, accessed 29 June 2023.

RANZCOG (Royal Australian and New Zealand College of Obstetricians and Gynaecologists) (2019) *Obstetrics Intrapartum care, labour and birth: Birth after previous caesarean section (C-Obs 38)*, accessed 28 July 2022.

RANZCOG (The Royal Australian and New Zealand College of Obstetricians and Gynaecologists) (2016) *Vaginal birth after caesarean section*, accessed 28 July 2022.

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Birth outcome indicators

The National Core Maternity Indicators (NCMIs) associated with birth outcomes present information on measures of outcome between 2004 and 2021.

Data for these indicators are presented by jurisdiction of birth, and at the national level by hospital's size (as measured by annual number of births), hospital sector, and mother's First Nations status. Some indicators are presented by remoteness, disadvantage quintile and other data groupings where relevant.

Birth outcomes

Three birth outcome indicators are presented in this report. Table 3 shows the proportion for the current year (2021) and the baseline year for each indicator, enabling comparison between these 2 points in time.

Table 3: Birth outcome indicators by proportion for baseline year and 2021

Indicator number	Indicator	Baseline year	Baseline (%)	Current year 2021 (%)
PI 04	Apgar score of less than 7 at 5 minutes for births at or after term	2004	0.9	1.3
PI 10	Small babies among births at or after 40 weeks gestation	2004	2.1	1.1
PI 13a	Third and fourth degree tears for all vaginal first births	2013	5.2	4.5
PI 13b	Third and fourth degree tears for all vaginal births	2013	3.0	2.7

Birth outcome indicators

Apgar scores are clinical indicators of a baby's condition shortly after birth, with a score of less than 7 indicating potential complications for the baby. For more information, see [Clinical commentary](#).

This indicator examines those liveborn babies with an Apgar score of less than 7 at 5 minutes for births at or after term (37 weeks of gestation or more).

Key findings

In 2021, 1.3% of liveborn babies born at or after term had an Apgar score of less than 7 at 5 minutes.

The proportion of liveborn babies born at or after term with an Apgar score of less than 7 at 5 minutes:

- has increased slightly from 0.9% in 2004 to 1.3% in 2021, but has remained relatively stable since 2013
- was highest in babies born to mothers aged younger than 20 (2.3% in 2021) compared with other age groups
- was higher for babies born in public hospitals (1.5%) than in private hospitals (0.8%) in 2021.

The interactive data visualisation (Figure 13) presents data for live births at or after term with an Apgar score of less than 7 at 5 minutes by selected maternal characteristics. Select the trend button to see how data have changed between 2004 and 2021.

Figure 13: Apgar score of less than 7 at 5 minutes for births at or after term

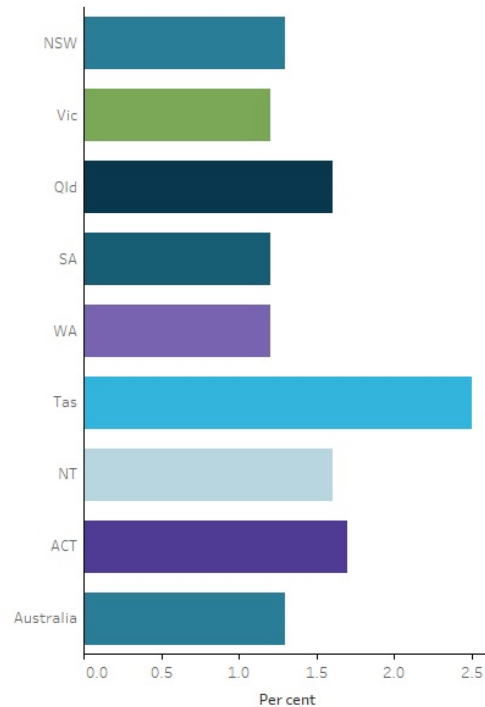
Apgar score of less than 7 at 5 minutes for births at or after term, 2004 to 2021.

This chart shows the proportion of babies with an Apgar score of less than 7 at 5 minutes for births at or after term, for the current data 2021 and trend data from 2004 to 2021. The proportion of babies with an Apgar score of less than 7 at 5 minutes for births at or after term, for all Australia showed a gradually increasing trend from 0.9% in 2004, peaking at 1.4% in 2016, with rates stabilising at 1.3% in all years since then.

Apgar score of less than 7 at 5 minutes for births at or after term by state/territory of birth, 2021

View data by
State/territory of birth

 Trend data  Data tables



Notes:

1. Includes liveborn babies only.
2. Some caution is required with interpretation of these percentages as the number of babies born at or after term with an Apgar score less than 7 is small.
3. Between 2010 and 2021, 14-16% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages.
4. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.

Source: AIHW analysis of NPDC.
<https://www.aihw.gov.au>

Clinical commentary

An Apgar score is based on five 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 the baby is adapting well to the environment, while a score of less than 7 indicates an increased risk of complications for the baby (AIHW 2023).

Apgar scores at 5 minutes of less than 7 are not specific to any condition and may reflect congenital anomaly, prematurity, perinatal infection, effects of drugs given to the mother for pain relief or anaesthesia, ineffective resuscitation or prolonged hypoxia before birth (Li et al. 2013). Babies with an Apgar score of less than 7 at 5 minutes have an increased likelihood of requiring resuscitation and admission to the special care nursery or neonatal intensive care unit. Low birthweight babies, pre-term babies and babies with a breech presentation accounted for a higher proportion of all liveborn babies born with Apgar scores less than 7 in 2021 (AIHW 2023). Maternal factors such as increased maternal age, obesity, maternal morbidity, especially diabetes, and maternal smoking during pregnancy, may contribute to a baby being born with a low Apgar score (Kharkova et al. 2017; Straube et al. 2010; Zhu et al. 2015).

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

AIHW (Australian Institute of Health and Welfare) (2023) *Australia's mothers and babies*, AIHW, Australian Government, accessed 29 June 2023.

Kharkova O, Grjibovski A, Krettek A, Nieboer E and Odland J (2017) 'Effect of smoking behaviour before and during pregnancy on selected birth outcomes among singleton full-term pregnancy: A Murmask country birth registry study', *International Journal of Environmental Research and Public Health*, 14(8):867, doi:10.3390/ijerph14080867.

Li F, Wu T, Lei X, Zhang H, Mao M and Zhang J (2013) 'The Apgar score and infant mortality', *PLOS One*, 8(7):e69072, doi:10.1371/journal.pone.0069072.

Straube S, Voigt M, Jorch G, Hallier E, Brieser V and Borchardt U (2010) 'Investigation of the association of Apgar score with maternal socio-economics and biological factors: an analysis of German perinatal statistics', *Archives of Gynaecology and Obstetrics*, 282(2):135-141, doi:10.1007/s00404-009-1217-7.

Zhu T, Tang J, Zhao F, Qu Y and Mu D (2015) 'Association between maternal obesity and offspring Apgar score or cord pH: a systematic review and meta-analysis', *Scientific Reports*, 5:18386, doi:10.1038/srep18386.



Birth outcome indicators

Birthweight for gestational age is a key indicator of infant health that is used both as an outcome measure for health and wellbeing of the mother in pregnancy and a principal determinant of a baby's chance of prospective survival, good health, development and wellbeing (DoH 2020). For more information, see [Clinical commentary](#).

This indicator looks at small babies born at or after 40 weeks gestation with a birthweight less than 2,750 grams.

Key findings

In 2021, 1.1% of babies born at or after term were classified as small.

The proportion of babies born at or after term who were classified as small:

- almost halved from 2.1% in 2004 to 1.1% in 2021
- was higher for babies born to mothers who reported smoking during pregnancy compared with mothers who did not (2.6% compared with 1.0% in 2021)
- was slightly higher for babies born to mothers living in areas of most disadvantage (1.4% in 2021) than other areas (1.0% in 2021).

The interactive data visualisation (Figure 14) presents data on small babies among births at or after 40 weeks gestation by selected maternal characteristics. Select the trend button to see how data have changed between 2004 and 2021.

Figure 14: Small babies among births at or after 40 weeks of gestation

Small babies among births at or after 40 weeks gestation, 2004 to 2021.

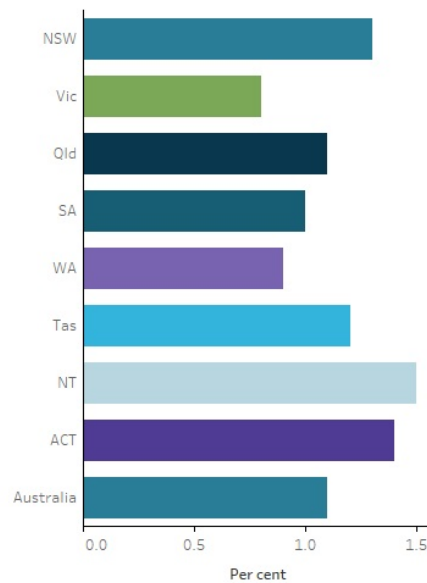
This chart shows the proportion of small babies among births at or after 40 weeks gestation, for the current data 2021 and trend data from 2004 to 2021. The proportion of small babies among births at or after 40 weeks gestation, for all Australia, showed a decreasing trend from 2.1% in 2004 to 1.1% in 2021.

Small babies among births at or after 40 weeks gestation by state/territory of birth, 2021

View data by
State/territory of birth



1.1%
of babies born at or after 40 weeks of gestation were classified as small (968 of 89,476 births in 2021)



Notes:

1. Caution should be used when comparing these results with other nationally and internationally reported indicators, as the cut-off birthweight may be different to this indicator.
2. Caution is required with interpretation of these percentages as the number of small babies born at or after 40 weeks gestation is small.
3. Between 2010 and 2021, 14–16% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages.
4. 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'.
5. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.

Source: AIHW analysis of NPDC.
<https://www.aihw.gov.au>

Clinical commentary

Babies born at or after 40 completed weeks of gestation (280 or more days after the first day of the last menstrual period) with a birthweight less than 2,750 grams are considered small for gestational age and are likely to have been affected by intrauterine growth restriction (AIHW 2022). Poor fetal growth is associated with increased risks of fetal death and compromise in labour (Draper et al. 2017). Late fetal growth restriction may predispose the baby to hypertension and diabetes in adulthood (Flenady et al. 2018; Sharma et al. 2016).

Some babies whose intrauterine growth is normal are small, and female babies are normally smaller than male babies of the same gestational age. Use of sex-specific birthweight cut-off points would align this indicator more closely with growth restriction.

Notes

For this indicator, small babies at or after 40 weeks gestation is defined as a birthweight less than 2,750 grams; the definition of low birthweight (grams) may be different in other national or international reporting indicators.

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References


AIHW (Australian Institute of Health and Welfare) (2022) *Health of mothers and babies*, AIHW, Australian Government, accessed 22 July 2022.

DoH (Department of Health) (2020) *Clinical Practice Guidelines: Pregnancy Care 2020 Edition*, DoH, Australian Government, accessed 6 June 2023.

Draper ES, Kurinczuk JJ and Kenyon S (Eds.) on behalf of MBRRACE-UK (2017) *Perinatal Confidential Enquiry: Term, singleton, intrapartum stillbirth and intrapartum-related neonatal death*, Department of Health Sciences, University of Leicester, Leicester, accessed 6 June 2023.

Flenady V, Wojciek AM and Middleton P (2018) 'Stillbirths: recall to action in high-income countries', *Lancet*, 387(10019):691-702, doi:10.1016/S0140-6736(15)01020-X.

Sharma D, Shastri S and Sharma P (2016) 'Intrauterine growth restriction: antenatal and postnatal aspects', *Clinical Medicine Insights: Pediatrics*, 10:67-83, doi:10.4137/CMPed.S40070.

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Birth outcome indicators

A perineal tear is the laceration of the skin and tissues that separate the vagina from the anus. Third or fourth degree tears are classified as severe trauma to the perineum and can occur spontaneously or as a result of obstetric intervention during vaginal birth. For more information, see [Clinical commentary](#).

This indicator looks at the proportion of third and fourth degree tears among all women who gave birth vaginally, and among all vaginal first births.

Key findings

In 2021:

- 4.5% of women giving birth for the first time and giving birth vaginally experienced a third or fourth degree tear
- 2.7% of all women giving birth vaginally experienced a third or fourth degree tear.

The proportion of third and fourth degree tears among women giving birth vaginally:

- has fluctuated around 5% between 2013 (5.2%) and 2021 (4.5%) for vaginal first births, and has remained fairly stable for all vaginal births during this time (3.0% in 2013 and 2.7% in 2021)
- was higher for women giving birth in public hospitals than private hospitals (5.0% compared with 2.5% for all vaginal first births in 2021)
- was highest in women aged 25-29 (3.1% in 2021) and lowest in women aged 40 and over (1.7% in 2021) for all vaginal births.

The interactive data visualisation (Figure 15) presents data on third and fourth degree tears for all vaginal births and all vaginal first births by selected maternal characteristics. Select the trend button to see how data have changed between 2013 and 2021.

Figure 15: Third and fourth degree tears

Third and fourth degree tears for all vaginal first births, 2013 to 2021.

This chart shows the proportion of third and fourth degree tears for all vaginal first births, for the current data 2021 and trend data from 2013 to 2021. The proportion of third and fourth degree tears for all vaginal first births, for all Australia, has fluctuated around 5% with 5.2% in 2013 and 4.5% in 2021. The chart also shows data for third and fourth degree tears for all vaginal births. The proportion of third and fourth degree tears for all vaginal births, in Australia, has remained fairly stable with 3.0% in 2013 and 2.7% in 2021.

Third and fourth degree tears for all vaginal births by state/territory of birth, 2021

Select indicator

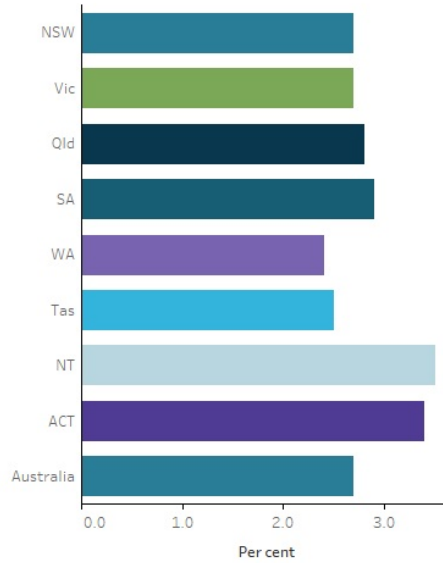
Third and fourth degree tears for all vaginal births

View data by

State/territory of birth

 Trend data

 Data tables



Notes:

1. Includes vaginal births only. In the case of multiple births, the method of birth of the first-born baby is used.
2. Some caution is required with interpretation of these percentages as the number of third and fourth degree tears is small.
3. 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'.
4. Age-standardised percentages for mother's First Nations status are presented, in addition to crude percentages, to allow comparisons between populations, removing the influence of differing age structures.

Source: AIHW analysis of NPDC.

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

Clinical commentary

Severe perineal trauma is defined as a third degree tear, which involves injury to the perineum which extends to the anal sphincter muscles; or a fourth degree tear, which involves injury to the perineum involving the external and internal sphincter and the anorectal epithelium (RCOG 2015). Severe trauma to the perineum can occur spontaneously or due to obstetric intervention during vaginal birth.

Severe perineal trauma is associated with maternal morbidity such as perineal pain, incontinence and subsequent difficult or painful sexual intercourse, and rarely, recto-vaginal fistula (RCOG 2015; ACSQHC 2021). The significant psychological effects of severe perineal trauma are under-researched but likely to be significant for many women in this situation (Priddis et al. 2013). While it may not always be possible to prevent these types of tears, the likelihood can be reduced through appropriate labour management and high-quality obstetric care (ACSQHC 2021, OECD 2021). Internationally, Australia's rate of third and fourth degree tears was higher than the average for OECD countries in 2019 or nearest year (OECD 2021). Variation between countries is likely to be affected by differences in clinical practice and reporting (ACSQHC 2018).

Risk factors during the antenatal period associated with an increased incidence of severe perineal trauma include nulliparity, young maternal age, ethnicity and poor nutritional status, high fetal weight, as well as previous experience of perineal tear (Dahlen et al. 2013). Intrapartum risk factors include fetal malpresentation (for example occipito-posterior position), episiotomy (especially midline), instrumental vaginal birth, prolonged second stage of labour, birth position and shoulder dystocia (Eskandar and Shet 2009; Hartman et al. 2005; Kudish et al. 2008; O'Mahony et al. 2010).

Indicator specifications and data

Excel source data tables are available from [Data](#).

For more information refer to [Specifications and notes for analysis](#) in the technical notes.

References

ACSQHC (Australian commission on Safety and Quality in Health Care) (2021) *Third and fourth degree perineal tears clinical care standard*, accessed 17 August 2022.

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Eskandar O and Shet D (2009) 'Risk factors for 3rd and 4th degree perineal tear', *Journal of Obstetrics and Gynaecology*, 29:119-22, doi:10.1080/01443610802665090.

Hartman K, Viswanathan M, Palmieri R, Gartlehner G, Thorp J and Lohr KN (2005) 'Outcomes of routine episiotomy: a systematic review', *JAMA*, 293:2141-8, doi:10.1001/jama.293.17.2141.

Kudish B, Sokol RJ and Kruger M (2008) 'Trends in major modifiable risk factors for severe perineal trauma, 1996-2006', *International Journal of Gynaecology and Obstetrics*, 102:165-70, doi:10.1016/j.ijgo.2008.02.017.

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O'Mahony F, Hofmeyr GJ and Menon V (2010) 'Choice of instruments for assisted vaginal delivery', *Cochrane Database Systematic Review*, 11:CD005455, doi:10.1002/14651858.CD005455.pub2.

Priddis H, Dahlen HG and Schmied V (2013) 'Women's experiences following severe perineal trauma: a meta-ethnographic synthesis', *Journal of Advanced Nursing*, 64:748-59, doi:10.1111/jan.12005.

RCOG (The Royal College of Obstetricians and Gynaecologists) (2015) Green top guidelines: *The management of Third- and Fourth-degree Perineal Tears: Green top guideline no. 29*, accessed 6 October 2021.



Indicator development background

The foundation of the National Core Maternity Indicators

The Douglas Inquiry into obstetric and gynaecological services carried out between 1990 and 2000 at the King Edward Memorial Hospital (KEMH) for Women in Perth, Western Australia, recommended that Australia establish an enquiry process with annual benchmarking and/or reporting of performance indicators for obstetric and gynaecological practice and outcomes (Fahy et al. 2001). In 2002, Australian Health Ministers agreed to support a collaborative project coordinated by the Department of Health, Western Australia (Department of Health Western Australia (DoHWA) 2007) to enable the analysis of comparative clinical performance data from tertiary obstetric and gynaecological hospitals in Australian jurisdictions (Women's Healthcare Australasia (WHA) 2007). In 2003, DoHWA conducted a 3-month pilot project of maternity data benchmarking. This 'proof of concept' project demonstrated the potential to improve the quality of maternity care through benchmarking.

In 2005, the National Maternity Services Collaboration on Health Policy (then Maternity Services Inter-Jurisdictional Committee (MSIJC)) noted to the Australian Health Ministers' Advisory Council (AHMAC) that it would be necessary to identify and develop a set of national performance indicators with a view to aligning service and clinical indicators (WHA 2007).

Under a grant from the Australian Council on Safety and Quality in Health Care (now the Commission), the DoHWA consulted with a number of agencies, establishing the Core Maternity Indicators Project (CMIP) to develop a national set of risk-adjusted maternity performance indicators. WHA managed the Project Plan developed by this group. This extensive body of work aimed to 'measure and evaluate safe and effective maternity care in a timely fashion' (WHA 2007).

In late 2008, the AHMAC transferred responsibility for the management and continuation of CMIP from the Australian Commission on Safety and Quality in Health Care to the MSIJC. The MSIJC's role was to provide consistency on national reporting of core maternity indicators. This project was also needed to identify an appropriate national repository for this information for ongoing coordinating, reporting and analysis.

The development of core maternity indicators aligns with the first recommendation of the National Review of Maternity Services undertaken by the Chief Nursing and Midwifery Officer on behalf of the Australian Government in 2008 which states:

That the Australian Government, in consultation with states and territories and key stakeholders, agree and implement arrangements for consistent, comprehensive national data collection, monitoring and review, for maternal and perinatal mortality and morbidity (Commonwealth of Australia 2009).

The MSIJC established an Expert Working Group in 2009 to reaffirm the core maternity indicators. A list of 20 National Core Maternity Indicators (NCMIs) was proposed by the Expert Working Group in early 2010 and funded by AHMAC in 2015-16; this formed the basis for the work undertaken by the Australian Institute of Health and Welfare (AIHW) (see [Tables 4a to 4d](#)).

National Core Maternity Indicator Development Project

In the first phase of the project a report on 10 of the 20 proposed NCMIs was produced using the AIHW National Perinatal Data Collection (NPDC) with clinical commentary from an Expert Commentary Group (ECG) (AIHW NPESU and AIHW 2013).

For more details see [Tables 4a to 4d](#) and the report: [Foundations for enhanced maternity data collection and reporting in Australia: National maternity data development project - Stage 1](#).

In 2012-13, the project explored the validity and feasibility of a possible 8 additional NCMIs to be added to the current set of 10 NCMIs. Clinical advice and input were provided by an ECG.

In consultation with key stakeholders and experts, definitions and technical specifications were developed for the 8 additional NCMIs, and existing and potential data sources for reporting were investigated. Further, an additional indicator (Indicator 21) was proposed during the consideration and development of the 8 additional indicators. Recommendations for next steps were made for each proposed NCMI.

The 9 potential additional indicators developed and investigated were:

- NCMI 11 - High risk women undergoing caesarean section who receive appropriate pharmacological thromboprophylaxis. Following investigation, it was recommended that this indicator should not be further developed or added to the current set of NCMIs at this stage.
- NCMI 12 - Babies born at or after 37 completed weeks of gestation admitted to a neonatal intensive care nursery or special care nursery for reasons other than congenital anomaly. Following investigation, it was recommended that this indicator required further data development, and this development should be undertaken to enable future reporting against this indicator.
- NCMI 13 - Third and fourth degree tears for (a) all first births and (b) all births. Following investigation, it was recommended that this indicator be added to the current set of 10 NCMIs for reporting using the NPDC.

- NCM1 14 - Blood loss of (i) greater than 1,000 mL and less than 1,500 mL, and (ii) 1,500 mL or more during first 24 hours after the birth of the baby (that is, major primary postpartum haemorrhage) for (a) vaginal births and (b) caesarean sections. Following investigation, it was recommended that this indicator be aligned with items on postpartum haemorrhage in the 2014-15 Perinatal Data Set Specification (lower limit now to include 1,000 mL blood loss and be reflected in the Indicator title); and added to the current set of 10 NCMI for reporting.
- NCM1 15 - Women having their second birth vaginally whose first birth was by caesarean section. Following investigation, it was recommended that this indicator be added to the current set of 10 NCMI for reporting using the NPDC.
- NCM1 16 - Separation of baby from the mother after birth for additional care. Following investigation, it was recommended that this indicator should not be further developed or added to the current set of NCMI at this stage.
- NCM1 17 - One-to-one care in labour. Following investigation, it was recommended that this indicator should not be further developed or added to the current set of NCMI at this stage.
- NCM1 18 - Caesarean sections at less than 39 completed weeks of gestation (273 days) without obstetric/medical indication. Following investigation, it was recommended that this indicator be added to the current set of 10 NCMI for reporting using the NPDC.
- NCM1 21 - Skin-to-skin contact between mother and baby after birth. During consideration and development of the 8 additional indicators, the ECG suggested the inclusion of this indicator. Following investigation, it was recommended that this indicator required further data development, and this development should be undertaken to enable future reporting against this indicator.

For more details see [Tables 4a to 4d](#) and the report: [National core maternity indicators - stage 2 report: 2007-2011](#).

In 2015, the AIHW undertook further work on the NCMI which included finalising 2 indicator specifications for reporting, data development, finalising the scope for one indicator based on the recommendations of the validity and feasibility work undertaken previously, and facilitating the revised data resupply from Victoria for the period 2009-2011.

The 2 additional indicators reported:

- NCM1 13 - Third and fourth degree tears for (a) all first births and (b) all births.
This was introduced into the NCMI suite of indicators and reported using 2013 data onwards. Noting that a nationally standardised data item for this indicator was included in the 2013-14 Perinatal National Minimum Data Set (NMDS).
- NCM1 15 - Women having their second birth vaginally whose first birth was by caesarean section. This was introduced into the NCMI suite of indicators and reported using 2007 data onwards. Noting that a nationally standardised data item for this indicator was included in the 2014-15 Perinatal NMDS.

Specifications were developed for NCM1 18: Caesarean section <39 weeks of gestation (273 days) without obstetric/ medical indication and NCM1 21: Skin-to-skin contact between mother and baby after birth. These specifications received support from the ECG. The specifications are still under review and have yet to be referred to the National Perinatal Data Development Committee (NPDDC) or tabled for endorsement by National Health Data and Information Standards Committee (NHDISC), formerly National Health Information and Performance Principal Committee (NHIPPC).

Specifications were developed for NCM1 12: Babies born at or after 37 completed weeks of gestation admitted to a neonatal intensive care nursery or special care nursery for reasons other than congenital anomaly. Following consultation, development work still needs to be conducted and this specification is under review. This specification has not yet been supported by the ECG.

For more details see [Tables 4a to 4d](#) and the report [National Core Maternity Indicators stage 3 and 4 results from 2010-2013](#).

The AIHW will endeavour to undertake further development of the current, proposed and any additional NCMI in the future, particularly in response to changes in evidence, policy, service provision or clinical practice.

Table 4a: National Core Maternity Indicator status - antenatal indicators

Indicator	Indicator specifications approved by NHIPPC*	Status as at July 2023
1. Smoking in pregnancy for all women giving birth	Yes	Published 2011 to 2021
2. Antenatal care in the first trimester for all women giving birth	Yes	Published 2011 to 2021
20. Models of care	No	Referred for further work elsewhere ^(a)

Notes:

* National Health Information and Performance Principal Committee (NHIPPC) is now retired and has been replaced by the National Health Data and Information Standards Committee (NHDISC).

- Work on this indicator will be covered by the National Maternity Data Development Project.

Table 4b: National Core Maternity Indicator status - labour and birth indicators - selected women

Indicator	Indicator specifications approved by NHIPPC*	Status as at July 2023
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5. Induction of labour for selected women giving birth for the first time	Yes	Published 2004 to 2021
6. Caesarean section for selected women giving birth for the first time	Yes	Published 2004 to 2021
7. Unassisted (non-instrumental) vaginal birth for selected women giving birth for the first time	Yes	Published 2004 to 2021
8. Assisted vaginal birth for selected women giving birth for the first time	Yes	Published 2004 to 2021

Notes:

* National Health Information and Performance Principal Committee (NHIPPC) is now retired and has been replaced by the National Health Data and Information Standards Committee (NHDISC).

Table 4c: National Core Maternity Indicator status - labour and birth indicators - all women

Indicator	Indicator specifications approved by NHIPPC*	Status as at July 2023
3. Episiotomy for women having their first baby and giving birth vaginally	Yes	Published 2004 to 2021
9. General anaesthetic for women giving birth by caesarean section	Yes	Published 2007 to 2021
11. High-risk women undergoing caesarean section who receive appropriate pharmacological thromboprophylaxis	No	Not to be reported ^(b)
15. Women having their second birth vaginally whose first birth was by caesarean section	Yes	Published 2007 to 2021
17. One-to-one care in labour	No	Not to be reported ^(c)
18. Caesarean sections at less than 39 completed weeks of gestation (273 days) without obstetric/ medical indication	No	Further development required ^(d)

Notes:

* National Health Information and Performance Principal Committee (NHIPPC) is now retired and has been replaced by the National Health Data and Information Standards Committee (NHDISC).

- b. The AIHW ECG recommended in 2013 that further development not be progressed. All jurisdictions agreed with this recommendation. This related to significant data quality issues.
- c. Maternity Services Inter-Jurisdictional Committee (MSIJC) recommended that further development of this indicator not be progressed.
- d. The data item underlying this indicator began to be reported voluntarily in 2014. National data are not yet of reportable quality.

Table 4d: National Core Maternity Indicator status - birth outcome indicators

Indicator	Indicator specifications approved by NHIPPC*	Status as at July 2023
4. Apgar score of less than 7 at 5 minutes for births at term	Yes	Published 2004 to 2021
10. Small babies among births at or after 40 weeks of gestation	Yes	Published 2004 to 2021
12. Babies born at or after 37 completed weeks of gestation admitted to a neonatal intensive care nursery or special care nursery for reasons other than congenital anomaly	No	Development work done in 2015-16. Further development required
13. Third and fourth degree tears for (a) all first births and (b) all births	Yes	Published 2013 to 2021
14. Blood loss of (i) >1,000 mL and < 1,500 mL and (ii) ≥1,500 mL during first 24 hours after the birth of the baby (that is, primary PPH) for (a) vaginal births and (b) caesarean sections	No	Further development required ^(d)

16. Separation of baby from the mother after birth for additional care	No	Not to be reported ^(c)
19. Supporting breastfeeding	No	Referred for further work elsewhere ^(e)
21. Skin-to-skin contact after birth	No	Development work done in 2015-16. Further development required

Notes:

* National Health Information and Performance Principal Committee (NHIPPC) is now retired and has been replaced by the National Health Data and Information Standards Committee (NHDISC).

- c. Maternity Services Inter-Jurisdictional Committee (MSIJC) recommended that further development of this indicator not be progressed.
- d. The data item underlying this indicator began to be reported voluntarily in 2014. National data are not yet of reportable quality.
- e. Work on this indicator was referred to the National Child Health and Wellbeing subcommittee of the Australian Population Health Development Principal Committee of the Australian Health Ministers' Conference (AHMC).

References

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Technical notes



Technical notes

Data source: National Perinatal Data Collection

The data used for the National Core Maternity Indicators is sourced from the National Perinatal Data Collection (NPDC).

The NPDC is a national population-based cross-sectional collection of data on pregnancy and childbirth. The data are based on births reported to the perinatal data collection in each state and territory in Australia. Midwives and other birth attendants, using information obtained from mothers and from hospital or other records, complete notification forms for each birth. A standard de-identified extract is provided to the Australian Institute of Health and Welfare (AIHW) on an annual basis to form the NPDC.

More information about the [National Perinatal Data Collection](#).

Data quality

The NPDC consists of the Perinatal National Minimum Data Set (NMDS) and some additional data items. The Perinatal NMDS uses agreed standards for data collection and regular reviews of compliance are conducted across all jurisdictions. Changes to all NMDSs are applied on a financial year basis from 1 July each year. Disaggregation and historical reporting of some indicators rely to an extent on non-NMDS data items, which are provided by jurisdictions on a voluntary basis and may be affected by differences in collection practices.

Due to data editing, subsequent updates of state and territory databases, and differences in scope for inclusion, the numbers may differ slightly from those published by the states and territories or other reporting.

Some data quality issues are specific to the NCMI rather than the NPDC as a whole. Information is not available from all jurisdictions to support the 12 indicators in all years. An overview of data availability for reporting against relevant indicators is provided in [Table 5](#). When a jurisdiction's data are missing, the national result can be affected. The effect is more pronounced if the population in the missing jurisdiction is large or when the jurisdictional result is very different to the national result. When data for a jurisdiction are missing, it can also affect other disaggregations. For instance, a jurisdiction like the Northern Territory has a relatively high proportion of First Nations mothers and mothers who live in *Very remote* areas. Subtotals for First Nations mothers and mothers who live in *Very remote* areas would be disproportionately affected if data from the Northern Territory were not available.

When Victoria supplied 2009 and 2010 data to the NPDC, legislation prevented the supply of data except Perinatal NMDS items, meaning that some NCMI could not be calculated for Victoria for these years. In 2015, following a change in legislation, Victoria resupplied data for 2010 and 2011. This included supply of non-NMDS items as well as updates to previously supplied data with enhanced data quality following completion of the implementation of their electronic transfer of data (ETOD) system. There are no remaining issues with the supply of Victorian data for 2010 and 2011, though the data in this report may differ from the provisional data reported previously by the AIHW in other publications.

In the data supplied from Tasmania prior to 2013, presentation at birth for caesarean sections births was not reported by hospitals using paper-based forms. Presentation at birth for caesarean sections births was included in the paper-based form from the 1 January 2013. As a result, Tasmania can only be reported in indicators that use presentation at birth in their definition from 2013 onwards.

From 2014, data item 'Caesarean section at most recent previous birth indicator' ([METEOR 422187](#)) was introduced into the Perinatal NMDS. Although not an NMDS/DSS item prior to 2014, data collected into the NPDC using the data element 'Caesarean section indicator (last previous birth)' ([METEOR 301993](#)) is used in the indicator definition of 'Women having their second birth vaginally whose first birth was by caesarean section' from 2007 to 2013. As a result, data from Victoria were not available in 2007 to 2009, or Western Australia in 2013.

Table 5: Jurisdictions for which perinatal data were not available for reporting the NCMI, 2004 to 2021

Indicator number	Indicator	Jurisdiction and years data not available
PI 05	Induction of labour for selected women giving birth for the first time	Tasmania 2004 to 2012 Victoria 2009
PI 06	Caesarean section for selected women giving birth for the first time	Tasmania 2004 to 2012 Victoria 2009
PI 07	Non-instrumental vaginal birth for selected women giving birth for the first time	Tasmania 2004 to 2012 Victoria 2009
PI 08	Instrumental vaginal birth for selected women giving birth for the first time	Tasmania 2004 to 2012 Victoria 2009
PI 03a	Episiotomy for women having their first baby and giving birth vaginally without instruments to assist the birth	Victoria 2009

PI 03b	Episiotomy for women having their first baby and giving birth vaginally assisted with instruments	Victoria 2009
PI 09	General anaesthetic for women giving birth by caesarean section	Victoria 2009 and 2010
PI 15	Women having their second birth vaginally whose first birth was by caesarean section	Victoria 2007 to 2009 Western Australia 2013



Technical notes

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- [Tobacco smoking during pregnancy](#)
- [Antenatal care in the first trimester](#)
- [Vaginal birth after caesarean section](#)
- [Selected women](#)
- [n.a. /n.p.](#)
- [Terminology](#)
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- [Methods](#)

Data specifications

Table 6: Data Specifications for National Core Maternity Indicators

Indicator	METEOR identifier
Indicator Set: National Core Maternity Indicators, 2023	772600
Antenatal Indicators	
PI 01-Tobacco smoking in pregnancy for all females giving birth	772603
PI 02-Antenatal care visits in the first trimester for all females giving birth	772605
Labour and birth indicators	
Selected women	
PI 05-Induction of labour for selected females giving birth for the first time	772611
PI 06-Caesarean section for selected females giving birth for the first time	772613
PI 07-Non-instrumental vaginal birth for selected females giving birth for the first time	772615
PI 08-Instrumental vaginal birth for selected females giving birth for the first time	772617
All women	
PI 03-Episiotomy for females giving birth for the first time and giving birth vaginally	772607
PI 09-General anaesthetic for females giving birth by caesarean section	772619
PI 15-Females having their second birth vaginally whose first birth was by caesarean section	772625
Birth outcome indicators	
PI 04-Apgar score of less than 7 at 5 minutes for births at or after term	772609
PI 10-Small babies among births at or after 40 weeks gestation	772621
PI 13-Third and fourth degree tears for vaginal births	772623

Note: For reporting purposes, the terms 'females' and 'women' are used interchangeably.

Tobacco smoking during pregnancy

- The smoking indicator has been calculated differently in reports of the National Core Maternity Indicators released from 2020. The current methodology provides a more accurate measure and aligns with the methodology used in the *Australia's mothers and babies* reports, which also uses data from the National Perinatal Data Collection. Data for all years has been updated to reflect the improved methodology.
- Smoking in the first 20 weeks of pregnancy for all women giving birth:
 - Calculation of the denominator includes the number of women who gave birth with a known smoking status in the first 20 weeks of pregnancy.

- Smoking after the first 20 weeks of pregnancy for all women who gave birth and reported smoking during pregnancy:
 - Calculation of the numerator includes women who reported smoking in the first 20 weeks of pregnancy and after the first 20 weeks of pregnancy. Calculation of the denominator includes women who reported smoking in the first 20 weeks of pregnancy.

Antenatal care in the first trimester

- The indicator 'Antenatal care visits in the first trimester for all women giving birth' has been calculated differently in reports of the National Core Maternity Indicators released from 2021. The current methodology provides a more accurate measure and aligns with the methodology used in the *Australia's mothers and babies* reports, which also uses data from the National Perinatal Data Collection. Data for all years has been updated to reflect the improved methodology.
- Calculation of the denominator includes women with a stated first antenatal visit in the valid range. The valid range for pregnancy duration at first antenatal visit is 3 to 46 weeks, and women with no antenatal care during pregnancy. Records with missing or invalid data for gestational age at first antenatal visit are excluded.

Vaginal birth after caesarean section

The indicator 'Women having their second birth vaginally whose first birth was by caesarean section' has been calculated differently in reports of the National Core Maternity Indicators released from 2021. The indicator was updated in 2021 to only include women whose second birth was a singleton birth. This methodology aligns with the indicator specification ([METEOR 772625](#)). Data for all years has been updated to reflect the updated methodology.

Selected women

- In 2022, the selected women criteria were updated to revise the gestational age at birth range to between 37 and 40 completed weeks gestation (previously between 37 and 41 completed weeks gestation).
- The following indicators report on selected women:
 - PI 05 Induction of labour for selected females giving birth for the first time.
 - PI 06 Caesarean section for selected females giving birth for the first time.
 - PI 07 Unassisted (non-instrumental) vaginal birth for selected females giving birth for the first time.
 - PI 08 Assisted (instrumental) vaginal birth for selected females giving birth for the first time.
- Selected women may include women with other medical and obstetric complications.
- These indicators have been calculated differently for this report than in reporting of the National Core Maternity Indicators released prior to 2022. This methodology aligns with the National Core Maternity Indicators, 2023 indicator specifications ([METEOR 772600](#)). Data for all years has been updated to reflect the updated methodology and may result in statistics that vary from what has previously been reported. Where necessary to prevent back-calculation of small numbers, consequential suppression has been applied as a result of this change.

n.a./n.p.

- n.a. not available
- n.p. not publishable - data were suppressed due to concerns about confidentiality or low reliability

Terminology

This report uses the terms 'woman' and 'women' to mean 'female' when referring to data collected in the National Perinatal Data Collection (NPDC) 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 the data collection, for more information on the scope of the NPDC see the [National Perinatal Data Collection](#) details.

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.

Notes for analysis by sub-populations

Data for all National Core Maternity Indicators (NCMI) are presented by three geographic boundaries:

- state and territory of birth
- Primary Health Network (PHN) of mother's usual residence
- Statistical area (SA3) of mother's usual residence

and at the national level by:

- hospital annual number of births
- hospital sector
- mother's First Nations status.

Some indicators are disaggregated by other data groupings where relevant.

Notes for each sub-population analysis are provided in the following sections.

State and territory of birth

Births in 'Other territories' are included within their closest state.

Mother's First Nations status

- First Nations women include those who identified as Aboriginal, Torres Strait Islander, or both Aboriginal and Torres Strait Islander origin. Non-Indigenous refers to women who have not identified as Aboriginal or Torres Strait Islander.
- Excludes mothers for whom First Nations status is missing or not stated.
- Data were directly age-standardised using the June 2001 Australian female estimated resident population aged 15-44 years.
- Crude (non-age-standardised) percentages are also presented for this disaggregation.

Hospital sector

Includes births that occurred in a hospital only.

Hospital annual number of births

Includes births that occurred in a hospital only.

Primary Health Network (PHN) of mother's usual residence

- PHN of mother's usual residence is presented using the boundaries released by the Department of Health in 2015 and 2017. Additional information: [Primary Health Networks](#).
- PHN is derived from Statistical Area Level 2 (SA2) of mother's area of usual residence (ABS Australian Statistical Geography Standard Edition 2016).
- Includes records where mother's usual residence is an Australian state or territory (including 'Other territories').
- Results for PHN are available from 2012 onwards.

Statistical Area Level 3 (SA3) of mother's usual residence

- SA3 of mother's usual residence uses the Australian Bureau of Statistics, Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, July 2016, Statistical Area Level 3 (SA3); ABS cat. no. 1270.0.55.001. Available from: [Statistical Area Level 3 \(SA3\)](#).
- SA3 was derived from SA2 of the ABS 2016 ASGS
- Includes records where mother's usual residence is an Australian state or territory (including 'Other territories').
- Results for SA3 of mother's usual residence reported using a 3-year aggregate, 2019-2021. The 2019-2021 SA3 calculation has been reported using the ABS 2016 ASGS.

Mother's age at birth

Excludes mothers for whom age is missing or not stated.

Mother's smoking status during pregnancy

Excludes mothers for whom smoking status was not stated.

Whether labour was established

Excludes records where onset of established labour is not stated.

Sex of baby

Excludes records where sex of baby is not stated or not assigned.

Whether an episiotomy was performed

- Data reported from 2004 to 2013, a combined laceration and episiotomy value could be recorded; from 2014 onwards, episiotomy could be recorded separately.
- Excludes records where it is not stated whether an episiotomy was performed.

Mother's country of birth

- Excludes records where mother's country of birth is not stated.
- Data were mapped to the ABS Standard Classification of Countries (SACC), 2016 and reported at the minor group level of the classification.

Remoteness of mother's area of residence

- Remoteness assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Area Level 2 (SA2) of mother's usual residence.
- Includes records where mother's usual residence is an Australian state and/or territory (excluding 'Other territories').
- Results for remoteness are only available from 2012.

Disadvantage quintile of mother's area of residence

- Disadvantage quintile assigned using the ABS Socio-Economic Indexes for Areas Index Relative Socio-economic Disadvantage 2016 scores applied to Statistical Area Level 2 (SA2) of mother's usual residence.
- Only includes records where mother's usual residence is an Australian state and/or territory (excluding 'Other territories').
- Results for disadvantage quintile are only available from 2012.

Methods

Age-standardised percentages

- Age-standardised percentages 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 for data reported by mother's First Nations status. This effectively removes the influence of the age structure on the summary rate. The report states where age-standardised percentages have been used.
- All age-standardised percentages in this report have used the June 2001 Australian female estimated resident population aged 15-44 years as the standard population.
- For more information on methods used to report NPDC data refer to: [Australia's mothers and babies - Methods](#).





Technical notes

See the [Mothers and babies - Glossary](#) for definitions.



Notes

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Data





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