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 2019 and are grouped into 3 broad topic areas—antenatal period, labour and birth and birth outcomes.

Cat. no: PER 95

Findings from this report:
- Women younger than 20 years were least likely to access antenatal care in the first trimester
- 43% of selected women had a non-instrumental vaginal birth for their first birth in 2019, falling from 52% in 2004
- In 2019 nearly 1 in 3 (31%) selected women giving birth for the first time had a caesarean section
- Almost 1 in 4 (23%) women having their first baby vaginally without instruments had an episiotomy in 2019

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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

Labour and birth indicators—selected women

Selected women include those aged between 20 and 34 years, whose baby’s gestational age at birth was between 37 and 41 completed weeks, with a singleton baby in the vertex presentation.

Labour and birth indicators—all women
Birth outcome indicators

**Episiotomy births (non-instrumental)**
- **1 in 4 women**
- 11,698 (23.2%) of the 50,385 women having their first baby vaginally without the use of instruments in 2019 had an episiotomy.

**Episiotomy births (instrumental)**
- 4 in 5 (79.6%) women having their first baby vaginally with instruments had an episiotomy in 2019, an increase from 2004.

**General anaesthetic for caesarean section births**
- 2007: 7,305 (6.2%) of 118,371 women
- 2019: 5,914 (5.5%) of 107,542 women

**Vaginal birth after caesarean**
- **13.3%** of 59,787 women in 2007
- **12.2%** of 29,657 women in 2019

**Appgar score**
- Of <7 at 5 minutes for births at or after term
- 6.9% in 2004
- 1.8% in 2019

**Small babies**
- 1.2% in 2019
- Birthweight less than 2,500 grams among babies born at or after 40 weeks

**Third & fourth degree tears**
- **2.9%**
- 5,525 of the 190,854 women having a vaginal birth had a third or fourth degree tear in 2019
- No change since 2013

**Third & fourth degree tears**
- **5.0%**
- 3,961 of 79,963 women having their first birth vaginally in 2019
- This has remained stable since 2013
Background and indicator development

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 2007) to enable the analysis of comparative clinical performance data from tertiary obstetric and gynaecological hospitals in Australian jurisdictions (Women’s Healthcare Australasia 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 (MSIJJC)) 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 (Women’s Healthcare Australasia (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. Women’s Healthcare Australasia 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 Australian Health Ministers’ Advisory Council 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 Table 1).

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 & AIHW 2013).

For more details see Table 1 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 was 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.
NCMI 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.

NCMI 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.

NCMI 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.

NCMI 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.

NCMI 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.

NCMI 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 Table 1 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 1 indicator based on the recommendations of the validity and feasibility work undertaken previously, and facilitating the revised data resupply from Victoria for 2009-2011.

The 2 additional indicators reported:

- NCMI 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).
- NCMI 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 NCMI 18: Caesarean section <39 weeks of gestation (273 days) without obstetric/medical indication and NCMI 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 (NPDC) 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 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 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 Table 1 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 1: National Core Maternity Indicator Status

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator specifications approved by NHIPPC*</th>
<th>Status as at September 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antenatal Indicators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Smoking in pregnancy for all women giving birth</td>
<td>Yes</td>
<td>Published 2011 to 2019</td>
</tr>
<tr>
<td>2. Antenatal care in the first trimester for all women giving birth</td>
<td>Yes</td>
<td>Published 2011 to 2019</td>
</tr>
<tr>
<td>20. Models of care</td>
<td>No</td>
<td>Referred for further work elsewhere&lt;sup&gt;(a)&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Labour and Birth Indicators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Induction of labour for selected women giving birth for the first time</td>
<td>Yes</td>
<td>Published 2004 to 2019</td>
</tr>
<tr>
<td>Indicator</td>
<td>Recommendation</td>
<td>Reporting Period</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>6. Caesarean section for selected women giving birth for the first time</td>
<td>Yes</td>
<td>Published 2004 to 2019</td>
</tr>
<tr>
<td>7. Unassisted (non-instrumental) vaginal birth for selected women giving birth for the first time</td>
<td>Yes</td>
<td>Published 2004 to 2019</td>
</tr>
<tr>
<td>8. Assisted vaginal birth for selected women giving birth for the first time</td>
<td>Yes</td>
<td>Published 2004 to 2019</td>
</tr>
<tr>
<td>All women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Episiotomy for women having their first baby and giving birth vaginally</td>
<td>Yes</td>
<td>Published 2004 to 2019</td>
</tr>
<tr>
<td>9. General anaesthetic for women giving birth by caesarean section</td>
<td>Yes</td>
<td>Published 2007 to 2019</td>
</tr>
<tr>
<td>11. High-risk women undergoing caesarean section who receive appropriate pharmacological thromboprophylaxis</td>
<td>No</td>
<td>Not to be reported&lt;sup&gt;(b)&lt;/sup&gt;</td>
</tr>
<tr>
<td>15. Women having their second birth vaginally whose first birth was by caesarean section</td>
<td>Yes</td>
<td>Published 2007 to 2019</td>
</tr>
<tr>
<td>17. One-to-one care in labour</td>
<td>No</td>
<td>Not to be reported&lt;sup&gt;(c)&lt;/sup&gt;</td>
</tr>
<tr>
<td>18. Caesarean sections at less than 39 completed weeks of gestation (273 days) without obstetric/medical indication</td>
<td>No</td>
<td>Further development required&lt;sup&gt;(d)&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

### Birth outcome Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Recommendation</th>
<th>Reporting Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Apgar score of less than 7 at 5 minutes for births at term</td>
<td>Yes</td>
<td>Published 2004 to 2019</td>
</tr>
<tr>
<td>10. Small babies among births at or after 40 weeks of gestation</td>
<td>Yes</td>
<td>Published 2004 to 2019</td>
</tr>
<tr>
<td>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</td>
<td>No</td>
<td>Development work done in 2015-16. Further development required.</td>
</tr>
<tr>
<td>13. Third and fourth degree tears for (a) all first births and (b) all births</td>
<td>Yes</td>
<td>Published 2013 to 2019</td>
</tr>
<tr>
<td>14. Blood loss of (1) &gt;1,000 mL and &lt; 1,500 mL and (ii) ≥1,500 mL during first 24 hours after the birth of the baby (i.e. primary PPH) for (a) vaginal births and (b) caesarean sections</td>
<td>No</td>
<td>Further development required&lt;sup&gt;(d)&lt;/sup&gt;</td>
</tr>
<tr>
<td>16. Separation of baby from the mother after birth for additional care</td>
<td>No</td>
<td>Not to be reported&lt;sup&gt;(c)&lt;/sup&gt;</td>
</tr>
<tr>
<td>19. Supporting breastfeeding</td>
<td>No</td>
<td>Referred for further work elsewhere&lt;sup&gt;(e)&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**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).

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

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 (MSIJJC) 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 is 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 (AHMHC).

**References**

AIHW NPESU (Australian Institute of Health and Welfare National Perinatal Epidemiology and Statistics Unit) & AIHW 2013. *National core maternity indicators*. Cat. no. PER 58. Canberra: AIHW.

DoHWA (Department of Health, Western Australia) 2007. Improving maternity services: working together across Western Australia: a policy framework. Perth: Government of Western Australia, Department of Health.


WHA (Women’s Healthcare Australasia) 2007. Supporting excellence in maternity care: the core maternity indicators project: findings from the core maternity indicators project. Canberra: WHA.
Geographic overview

State and territory of birth

Chart title: NCMIs by state and territory of birth in 2019

The chart shows the latest data for each state and territory in a bar chart, and an interactive map of Australia. Indicators can be selected using a drop down menu. The first indicator listed shows the proportion of all women who gave birth who smoked in the first 20 weeks of pregnancy in 2019. Overall for Australia, 9.0% of all women who gave birth smoked in the first 20 weeks of pregnancy in 2019. The percentage of women who gave birth who smoked in the first 20 weeks of pregnancy in 2019 across the states and territories varied between 5.6% and 20.6%.

Trend data for states and territories can also be selected using a second tab at the top of the chart. This information will also be summarised in the following pages.

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

Smoking in the first 20 weeks of pregnancy for all women giving birth by state and territory of birth, 2019

9.0%
of women who gave birth reported smoking tobacco in the first 20 weeks of pregnancy (28,701 of 296,990 births in 2019)

20.6% Northern Territory
13.8% Tasmania
11.6% Queensland
9.6% South Australia
8.4% New South Wales
7.7% Western Australia
7.7% Victoria
5.0% Australian Capital Territory

Notes:
Smoking during pregnancy is self-reported smoking of tobacco.
Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.

Source: AIHW analysis of NNDSS data.
http://www.aihw.gov.au

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Geographic overview

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

Chart title: NCMIs by Primary Health Network (PHN) of mother’s usual residence

The chart shows the latest indicator data for of smoking for all 31 Primary Health Networks (PHNs). There is also an interactive map of Australia enabling access to information for the 31 PHNs. The other indicators can be selected using a drop down menu. The first indicator graphic shows the proportion of all women who gave birth who smoked in the first 20 weeks of pregnancy in 2019. Overall for Australia, 9.0% of all women who gave birth smoked in the first 20 weeks of pregnancy in 2019. The percentage of women who gave birth who smoked in the first 20 weeks of pregnancy in 2019 across PHNs varied between 1.1% and 20.3%.

Trend data for PHNs can also be selected using the switch to table view button in the chart.

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

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Source: AIHW analysis of 2018-19 NPDIC data
http://www.aihw.gov.au
Geographic overview
Local Statistical Area Level 3 (SA3) of mother’s usual residence

The chart shows the latest data for the lowest rates of smoking for four Local Statistical Area Level 3 (SA3s) and the highest rates of smoking for three SA3s in a bar chart. There is also an interactive map of Australia enabling access to information for the 340 SA3s. Indicators can be selected using a drop down menu. The first indicator graphic shows the proportion of all women who gave birth who smoked in the first 20 weeks of pregnancy using a three year aggregate, 2017-2019. Overall for Australia, 9.3% of all women who gave birth smoked in the first 20 weeks of pregnancy in 2017-2019. The percentage of women who gave birth who smoked in the first 20 weeks of pregnancy in 2017-2019 across SA3s varied between 0.6% and 49.2%.

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

Notes:
Data excludes mothers whose smoking status was not stated.
Smoking during pregnancy is self-reported smoking of tobacco.
Due to differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
Data for Statistical Local Area Level 3 (SA3) of mother’s usual residence reported using a 3 year aggregate, 2017-2019.
N.P. not publishable — data was suppressed due to concerns about confidentiality or low reliability.

Source: AIHW analysis of NPDC data
http://www.aihw.gov.au

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Antenatal period indicators

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 2019.

Data for each indicator are presented by jurisdiction of birth, and at the national level by hospital annual number of births, hospital sector, and mother’s Indigenous status. Some indicators are presented by remoteness, disadvantage quintile and other data groupings where relevant.

During the antenatal period:

In 2019, fewer than 1 in 10 women (9.0%) smoked in the first 20 weeks of pregnancy, a decrease from 12.9% in 2011. However, three-quarters (75.1%) of women who previously reported smoking continued to smoke after the first 20 weeks of pregnancy.

The proportion of women receiving antenatal care in the first trimester (3 to 13 weeks of pregnancy) remained steady in the majority of jurisdictions between 2011 and 2019 with around three in four women (76.6%) receiving antenatal care in their first trimester in 2019.

## Antenatal period indicators by proportion for baseline year and 2019

<table>
<thead>
<tr>
<th>Measure</th>
<th>Baseline year</th>
<th>Baseline per cent (%)</th>
<th>Current year 2019 per cent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI01 Tobacco smoking in pregnancy</td>
<td>2011</td>
<td>12.9</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>70.8</td>
<td>75.1</td>
</tr>
<tr>
<td>PI02 Antenatal care</td>
<td>2011</td>
<td>65.7</td>
<td>76.6</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>37.5</td>
<td>55.7</td>
</tr>
</tbody>
</table>

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Antenatal period indicators

Smoking during pregnancy

Chart title: Smoking in the first 20 weeks of pregnancy for all women giving birth, by state/territory and all Australia, 2011 to 2019.

The chart shows the proportion (%) of all women who gave birth who smoked in the first 20 weeks of pregnancy from 2011 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion for all Australian mothers decreased from 12.9% in 2011 to 9.0% in 2019.

Another smoking indicator can be selected showing the proportion of all women who gave birth and reported smoking in the first 20 weeks of pregnancy who also reported smoking during pregnancy after twenty weeks. This proportion has increased from 2011 (70.8%) to 2019 (75.1%).

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 the Data tab.
For more information, refer to Specifications and notes for analysis in the technical notes.

References


Antenatal period indicators

Antenatal care in the first trimester

Chart title: Antenatal care in the first trimester for all women giving birth, by State/territory of birth and all Australia, 2011 to 2019.

This chart shows the proportion of women giving birth who received antenatal care in the first trimester (before 14 weeks gestation), by state/territory of birth, 2011 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion for all Australian mothers increased from 65.7% in 2011 to 76.6 in 2019.

Another smoking antenatal care indicator can be selected showing the proportion of women giving birth who had their first antenatal visit within the first 10 weeks of pregnancy. The proportion has increased from 37.5% in 2011 to 55.7% in 2019.

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 2021; 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 the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.

References
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 2019.

Data for each indicator are presented by jurisdiction of birth, and at the national level by hospital annual number of births, hospital sector, and mother’s Indigenous status. Some indicators are presented by remoteness of residence, disadvantage quintile and other data groupings where relevant.

During labour and birth:

- The proportion of selected first-time mothers for whom labour was induced increased from 31.0% in 2004 to 46.8% in 2019.
- From 2004 to 2019, for selected women giving birth for the first time, the rate of non-instrumental vaginal births decreased (51.9% to 43.1%) while instrumental vaginal births increased (22.8% to 26.2%).
- The rate of caesarean sections in selected first-time mothers increased from 25.3% in 2004 to 30.7% in 2019.
- In 2019, nearly one quarter of women (23.2%) received an episiotomy in a non-instrumental vaginal birth, an increase from 16.2% in 2004.
- Four in five women (79.6%) received an episiotomy in an instrumental vaginal birth in 2019, an increase from 60.7% in 2004.
- In 2019, around 1 in 8 women (12.2%) had their second birth vaginally after having their first birth by caesarean section, a rate which has remained stable since 2007.
- Around 1 in 20 (5.5%) of women who had a caesarean section birth in 2019 had general anaesthetic, a decrease from 2007 (8.2%).

Labour and birth indicators by proportion for baseline year and 2019

<table>
<thead>
<tr>
<th>Measure</th>
<th>Baseline year</th>
<th>Baseline per cent (%)</th>
<th>Current year 2019 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selected Women</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI05 Induction of labour for selected women giving birth for the first time</td>
<td>2004</td>
<td>31.0</td>
<td>46.8</td>
</tr>
<tr>
<td>PI06 Caesarean section for selected women giving birth for the first time</td>
<td>2004</td>
<td>25.3</td>
<td>30.7</td>
</tr>
<tr>
<td>PI07 Non-instrumental vaginal birth for selected women giving birth for the first time</td>
<td>2004</td>
<td>51.9</td>
<td>43.1</td>
</tr>
<tr>
<td>PI08 Instrumental vaginal birth for selected women giving birth for the first time</td>
<td>2004</td>
<td>22.8</td>
<td>26.2</td>
</tr>
<tr>
<td><strong>All Women</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>PI03 Episiotomy for women having their first baby and giving birth vaginally a. without instruments to assist the birth</td>
<td>2004</td>
<td>16.2</td>
<td>23.2</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>60.7</td>
<td>79.6</td>
</tr>
<tr>
<td>PI09 General anaesthetic for women giving birth by caesarean section</td>
<td>2007</td>
<td>8.2</td>
<td>5.5</td>
</tr>
<tr>
<td>PI15 Women having their second birth vaginally whose first birth was by caesarean section</td>
<td>2007</td>
<td>13.3</td>
<td>12.2</td>
</tr>
</tbody>
</table>

Note: Selected women include those aged between 20 and 34 years, whose baby’s gestational age at birth was between 37 and 41 completed weeks, with a singleton baby in the vertex presentation.

Selected women

Selected women include those aged between 20 and 34 years, whose baby’s gestational age at birth was between 37 and 41 completed weeks, with 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. The proportion of selected women is approximately one-third (29.2%) of all women who gave birth in 2019.
Labour and birth indicators

Induction of labour

Chart title: Induction of labour for selected women giving birth for the first time, by State/territory of birth and all Australia, 2004 to 2019.

This chart shows the proportion of induced labour for selected women giving birth for the first time, by state/territory of birth, 2004 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion for selected women induced in giving birth for the first time increased from 31.0% in 2004 to 46.8% in 2019.

Selected women

Selected women include those aged between 20 and 34 years, whose baby's gestational age at birth was between 37 and 41 completed weeks, whose baby was a singleton and whose baby's presentation was vertex.

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. The proportion of selected women is approximately one-third (29.2%) of all women who gave birth in 2019.

Clinical commentary

Induction is an intervention to stimulate the onset of labour. 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 & Kenny 2013). These factors also assist in determining the method of induction, which can be surgical (including artificial rupture of membranes) or medical (including use of prostaglandins and/or oxytocin) (AHMAC 2012; 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).
Indicator specifications and data
Excel source data tables are available from the Data tab.
For more information refer to Specifications and notes for analysis in the technical notes.

References


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Labour and birth indicators

Caesarean section

Chart title: Caesarean section for selected women giving birth for the first time, by State/territory of birth and all Australia, 2004 to 2019.

This chart shows the proportion of women receiving a Caesarean section for selected women giving birth for the first time, by state/territory of birth, 2004 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion for selected women giving birth for the first time receiving a Caesarean section increased from 25.3% in 2004 to 30.7% in 2019.

Selected women

Selected women include those aged between 20 and 34 years, whose baby’s gestational age at birth was between 37 and 41 completed weeks, with a singleton baby in the 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. The proportion of selected women is approximately one-third (29.2%) of all women who gave birth in 2019.

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 n.d.). A caesarean section may be planned (elective) if there is a reason that prevents the baby being born by a vaginal birth, 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 (Betran et al. 2016; Villar et al. 2007; Keag et al. 2018).

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 for a specific rate (WHO 2015). The caesarean section rate has increased internationally between 2000 and 2017 (OECD 2019). Australia’s caesarean section rate was higher than the OECD average over this time and ranked 27th out of 34 OECD countries in 2017, with a rate of 33.7 per 100 live births (ranked from lowest to highest) (OECD 2019). In 2019, 36.0% of all women giving birth in Australia had a caesarean section (AIHW...
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 (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 in Australia can be found in the Australia's mothers and babies report.

## Indicator specifications and data
Excel source data tables are available from the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.

### References


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Labour and birth indicators

Non-instrumental vaginal birth

Chart title: Non-instrumental vaginal birth for selected women giving birth for the first time, by State/territory of birth and all Australia, 2004 to 2019.

This chart shows the proportion of women having a non-instrumental vaginal birth for selected women giving birth for the first time, by state/territory of birth, 2004 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion for selected women having a non-instrumental vaginal birth for selected women giving birth for the first time decreased from 51.9% in 2004 to 43.1% in 2019.

Selected women

Selected women include those aged between 20 and 34 years, whose baby’s gestational age at birth was between 37 and 41 completed weeks, whose baby was a singleton and whose baby’s presentation was vertex.

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. The proportion of selected women is approximately one-third (29.2%) of all women who gave birth in 2019.

Clinical commentary

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 & Redshaw 2012).

Maternal risks associated with vaginal birth include perineal tears, damage to the pelvic floor, pelvic organ prolapse, and persistent perineal or vulvar pain (van Roosmalen & Meguid 2014). Potential neonatal risks related to vaginal births include shoulder dystocia, fetal distress and birth injuries (Hannah et al. 2000).

Indicator specifications and data

Excel source data tables are available from the Data tab.
References


Labour and birth indicators

Instrumental vaginal birth

Chart title: Assisted (Instrumental) vaginal birth for selected women giving birth for the first time, by State/territory of birth and all Australia, 2004 to 2019.

This chart shows the proportion of women having an assisted instrumental vaginal birth for selected women giving birth for the first time, by state/territory of birth, 2004 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion for selected women having an instrumental vaginal birth for selected women giving birth for the first time increased from 22.8% in 2004 to 26.2% in 2019.

Selected women

Selected women include those aged between 20 and 34 years, whose baby’s gestational age at birth was between 37 and 41 completed weeks, with a singleton baby in the 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. The proportion of selected women is approximately one-third (29.2%) of all women who gave birth in 2019.

Clinical commentary

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).

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 obstetric and women’s healthcare groups recommend that episiotomy is used selectively, rather than routinely, in association with vacuum and forceps assistance to minimise that risk (RANZCOG 2020; RCOG 2020; WHA 2017).
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 the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.

**References**


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Labour and birth indicators

Episiotomy

Chart title: Episiotomy for women having their first baby and giving birth vaginally assisted (instrumental), by State/territory of birth and all Australia, 2004 to 2019.

This chart shows the proportion of women having their first baby with an episiotomy and giving birth vaginally (instrumental), by state/territory of birth, 2004 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion of women giving birth for the first time, vaginally assisted (with instruments) who had an episiotomy increased from 60.7% in 2004 to 79.6% in 2019.

The chart also includes an option to view data for the proportion of women giving birth for the first time, vaginally without the use of instruments who had an episiotomy. This has increased from 16.2% in 2004 to 23.2% in 2019.

Clinical Commentary

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). 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 use of episiotomy must be discussed prospectively with the woman (RCOG 2015).

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; RCOG 2015).

Indicator specifications and data

Excel source data tables are available from the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.

References

Labour and birth indicators

General anaesthetic for women giving birth by caesarean section

This chart shows the proportion of women having a general anaesthetic giving birth by caesarean section, by state/territory of birth, 2007 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion of women receiving a general anaesthetic giving birth by caesarean section for all Australia decreased from 8.2% in 2007 to 5.5% in 2019.

Clinical commentary

Regional anaesthesia (or epidural) is the most common method of providing anaesthesia for caesarean section (95%) (AIHW 2021). 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 & Mustafa 2009).

Indicator specifications and data

Excel source data tables are available from the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.

References


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Labour and birth indicators

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

Chart title: Women having their second birth vaginally whose first birth was by caesarean section, by State/territory of birth and all Australia, 2007 to 2019.

This chart shows the proportion of women having their second birth vaginally whose first birth was by caesarean section, by state/territory of birth, 2007 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion of women having their second birth vaginally whose first birth was by caesarean section for all Australia varied from 13.3% in 2007, peaking at 14.1% in 2010, dropping to 12.2% in 2017 and remaining steady at 12.2% in 2019.

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 86% of pregnant women with a history of caesarean section birth having a subsequent caesarean section, while the remainder have a vaginal birth (AIHW 2021).

Both RCS and VBAC are associated with benefits and harms. Risks of planned VBAC when compared with planned RCS include haemorrhage, need for blood transfusion, uterine rupture, and perinatal death (Guise et al. 2010). About 70% of women who had a previous caesarean section are good candidates for non-instrumental vaginal birth, with 70–87% who attempt succeeding (Frass & Harazi 2011; Potera 2010).

Indicator specifications and data

Excel source data tables are available from the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.

References


Birth outcome indicators

The National Core Maternity Indicators (NCMIs) associated with birth outcomes present information on measures of outcome between 2004 and 2019.

Data for each indicator are presented by jurisdiction of birth, and at the national level by hospital annual number of births, hospital sector, and mother’s Indigenous status. Some indicators are presented by remoteness, disadvantage quintile and other data groupings where relevant.

Birth outcomes:

- In 2019, 1.3% of babies had an Apgar score of less than 7 at 5 minutes, an increase from 0.9% in 2004.
- The proportion of small babies born at or after term decreased from 2.1% in 2004 to 1.2% in 2019.
- 1 in 20 (5.0%) vaginal first births resulted in the women experiencing a third or fourth degree perineal tear, a rate which has remained stable since 2013.

<table>
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<th>Baseline year</th>
<th>Baseline per cent (%)</th>
<th>Current year 2019 (%)</th>
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<td>0.9</td>
<td>1.3</td>
</tr>
<tr>
<td>PI10</td>
<td>2004</td>
<td>2.1</td>
<td>1.2</td>
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<td>PI13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. for all vaginal first births</td>
<td>2013</td>
<td>5.2</td>
<td>5.0</td>
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<tr>
<td>b. for all vaginal births</td>
<td>2013</td>
<td>3.0</td>
<td>2.9</td>
</tr>
</tbody>
</table>

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Birth outcome indicators

Apgar score of less than 7 at 5 minutes for birth at or after term

Title: Apgar score of less than 7 at 5 minutes for births at or after term, by State/territory of birth and all Australia, 2007 to 2019.

This chart shows the proportion of babies with an Apgar score of less than 7 at 5 minutes for births at or after term, by state/territory of birth, 2007 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. 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 an increasing trend from 0.9% in 2004 to 2006, peaking at 1.4% in 2016, with rates of 1.3% in 2017, 2018 and 2019.

Clinical commentary

Apgar scores are clinical indicators of a baby’s condition shortly after birth. The 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 (AIHW 2021).

An Apgar score of 7 or more at 5 minutes after birth indicates the baby is adapting well to the environment, while a score of less than 7 indicates complications for the baby (AIHW 2021). Between 2004 and 2019 there has been a noticeable increase in the incidence of babies born at or after term with an Apgar score less than 7 at 5 minutes. The cause of this change is not clear.

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). 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 the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.

References


Birth outcome indicators

Small babies among births at or after 40 weeks of gestation

Chart title: Small babies among births at or after 40 weeks gestation, by State/territory of birth and all Australia, 2004 to 2019.

This chart shows the proportion of small babies among births at or after 40 weeks gestation, by state/territory of birth, 2004 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion of small babies among births at or after 40 weeks gestation, for all Australia, showed a decreasing trend from 2.1% (2004) to 1.2% in 2019.

Clinical commentary

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).

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 likely to have been affected by intrauterine growth restriction (IUGR) (AIHW 2020). Poor fetal growth is associated with increased risks of fetal death and compromise in labour. Late fetal growth restriction may predispose the baby to hypertension and diabetes in adulthood (Draper et al. 2017; 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 the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.
References


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Birth outcome indicators

Third and fourth degree tears

Chart title: Third and fourth degree tears for all vaginal first births, by State/territory of birth and all Australia, 2013 to 2019.

This chart shows the proportion of third and fourth degree tears in mothers for all vaginal first births, by state/territory of birth, 2013 to 2019. Data can be viewed for each state/territory of birth, and for all Australia. The proportion of third and fourth degree tears for all vaginal first births, for all Australia, showed little change with 5.2% in 2013 to 5.0% in 2019. The chart also includes an option to display 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 steady with 3.0% in 2013 and 2.9% in 2019.

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, internal and epithelium of the anal sphincter (RCOG 2015). Severe trauma to the perineum can occur spontaneously or as a result of 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). 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).

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 & 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 the Data tab.

For more information refer to Specifications and notes for analysis in the technical notes.


Technical notes

Data source and quality

State and territory health departments are thanked for their contribution to the National Perinatal Data Collection and their review of information. The authors also gratefully acknowledge the clinical advice and input of the expert reviewers:

- Professor Michael Humphrey AM, Perinatal Adviser to AIHW, Chair National Maternal and Perinatal Mortality Advisory Group, Adjunct Professor, James Cook University
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The AIHW acknowledges funding provided by the Australian Government Department of Health as part of the National Maternity Data Development Project (NMDDP).

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. With the exception of two indicators (Apgar score and small babies at term), the indicator definitions rely to some 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 NCMIs 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 2. When a jurisdictions 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 effect other disaggregation. For instance, a jurisdiction like the Northern Territory has a relatively high proportion of mothers who live in Very remote areas and who are Indigenous. Subtotals for mothers who live in Very remote areas and Indigenous mothers 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 NCMIs 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 2: Jurisdictions for which perinatal data were not available for reporting the NCMIs, 2004–2019
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<td>Victoria 2009</td>
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<td>Caesarean section for selected women giving birth for the first time</td>
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<td>Instrumental vaginal birth for selected women giving birth for the first time</td>
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<td>General anaesthetic for women giving birth by caesarean section</td>
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Technical notes
Specifications and notes for analysis
Note: For reporting purposes, the terms 'females' and 'women' are used interchangeably.

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</tr>
<tr>
<td>PI 06–Caesarean section for selected females giving birth for the first time</td>
<td>747739</td>
</tr>
<tr>
<td>PI 07–Non-instrumental vaginal birth for selected females giving birth for the first time</td>
<td>747909</td>
</tr>
<tr>
<td>PI 08–Instrumental vaginal birth for selected females giving birth for the first time</td>
<td>747911</td>
</tr>
<tr>
<td>All Women</td>
<td></td>
</tr>
<tr>
<td>PI 03–Episiotomy for females giving birth for the first time and giving birth vaginally</td>
<td>747727</td>
</tr>
<tr>
<td>PI 09–General anaesthetic for females giving birth by caesarean section</td>
<td>748047</td>
</tr>
<tr>
<td>PI 15–Females having their second birth vaginally whose first birth was by caesarean section</td>
<td>748053</td>
</tr>
<tr>
<td>Birth outcome indicators</td>
<td></td>
</tr>
<tr>
<td>PI 04–Apgar score of less than 7 at 5 minutes for births at or after term</td>
<td>747730</td>
</tr>
<tr>
<td>PI 10–Small babies among births at or after 40 weeks gestation</td>
<td>748049</td>
</tr>
<tr>
<td>PI 13–Third and fourth degree tears for vaginal births</td>
<td>748051</td>
</tr>
</tbody>
</table>

Tobacco smoking during pregnancy
- The smoking indicator has been calculated differently for this report than in reporting of the National Core Maternity Indicators released prior to 2020. This 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 and reported smoking tobacco 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 for this report than in reporting of the National Core Maternity Indicators released prior to 2021. This 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 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’ indicator has been updated in 2021 to only include women whose second birth was a singleton birth. This methodology aligns with the indicator specification (METeOR 748053). Data for all years has been updated and may differ slightly from reporting of the National Core Maternity Indicators published prior to 2021.

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 local area (SA3) of mother’s usual residence

and at the national level by:

- hospital annual number of births
- hospital sector
- mother’s Indigenous status

Some indicators are disaggregated by other data groupings where relevant.

Notes for each sub-population analysis are as follows:

State and territory of birth
Births in ‘Other territories’ are included within their closest state.

Mother’s Indigenous status
- Excludes mothers for whom Indigenous status is missing or not stated.
- Data has been directly age standardised using the June 2001 Australian female estimated resident population aged 15-44 years.

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

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 Areas 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 and/or territory (including ‘Other territories’).
- Results for PHN are available from 2012 onwards.

Statistical local area (SA3) of mother’s usual residence
- Between 2012 and 2016, SA3 derived from Statistical Area Level 2 (SA2) of the ABS 2011 Australian Statistical Geography Standard (ASGS) (or Statistical Local Area for jurisdictions for which SA2 was not available). From 2017, SA3 derived from SA2 of the ABS 2016 ASGS. For 2015, data from the ACT were based on the postcode of usual residence.
- Includes records where mother’s usual residence is an Australian state and/or territory (including ‘Other territories’).
- Results for SA3 of mother’s usual residence reported using a 3 year aggregate, 2017-2019. The 2017-2019 SA3 calculation has been reported to 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.

Remoteness of mother’s area of residence
- Remoteness assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Areas Level 2 (SA2) of mother’s area of 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 SEIFA IRSD 2016 scores applied to Statistical Areas Level 2 (SA2) of mother’s area of 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. This effectively removes the influence of the age structure on the summary rate. The report states where age-standardised rates have been used.

All age-standardised rates in this report have used the June 2001 Australian female estimated resident population aged 15-44 years as the standard population.

For more information on methods used to report NPDC data refer to: Australia's mothers and babies - Methods.
Technical notes

Glossary
See the Mothers and babies glossary for definitions.
Related material

Resources

Australia’s mothers and babies 2018—in brief
Resource
View

Australia’s mothers and babies
Resource
View

National Core Maternity Indicators stage 3 and 4 results from 2010-2013
Resource
View

National Core Maternity Indicators—stage 2 report: 2007-2011
Resource
View

National Core Maternity Indicators 2018: Summary Report
Resource
View

Foundations for enhanced maternity data collection and reporting in Australia: National maternity data development project - Stage 1
Resource
View

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