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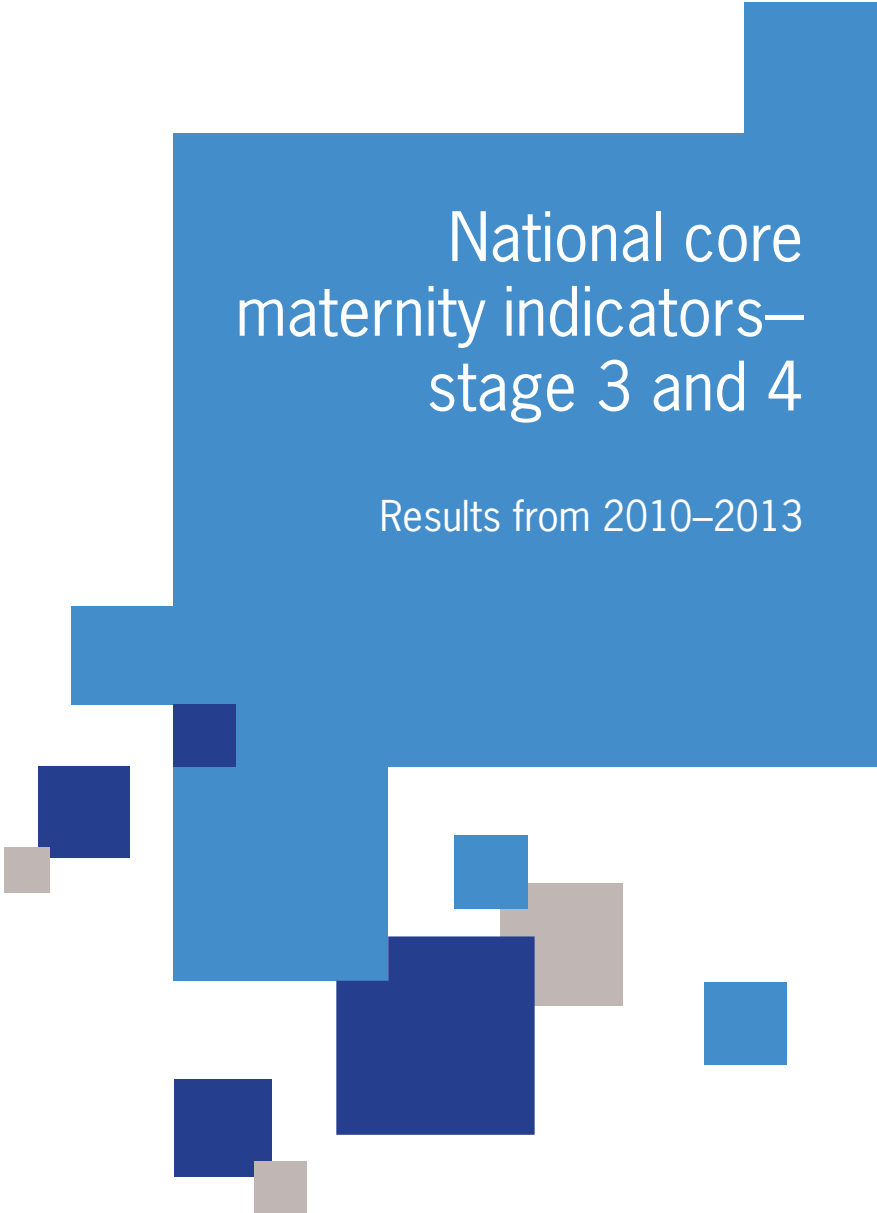
Australian Institute of  
Health and Welfare



# National core maternity indicators— stage 3 and 4

Results from 2010–2013





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Results from 2010–2013

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## Abbreviations

ACHS	Australian Council on Healthcare Standards
AIHW	Australian Institute of Health and Welfare
BFHI	Baby-Friendly Hospital Initiative
DoHWA	Department of Health, Western Australia
ECG	Expert Commentary Group
ICD-10-AM	International statistical classification of diseases and related health problems, 10th revision, Australian modification
KEMH	King Edward Memorial Hospital
METeOR	Metadata Online Registry (AIHW)
MSIJC	Maternity Services Inter-Jurisdictional Committee
NA	not applicable
NCMI	National Core Maternity Indicators
NHMD	National Hospital Morbidity Database
NICN	neonatal intensive care nursery
NICU	neonatal intensive care unit
NPDC	National Perinatal Data Collection
SCN	special care nursery
WHA	Women's Health Australasia
WHO	World Health Organization

## Symbol

— nil or rounded to zero

# Summary

The National Core Maternity Indicators (NCMIs) present information on measures of clinical activity and outcomes between 2004 and 2013. The purpose of the NCMIs is to monitor the safety and quality of maternity care to ensure that there is continual improvement in the quality of maternity services following the introduction of the National Maternity Services Plan (AHMC 2011). This report covers 10 indicators previously reported and 2 new indicators. Data are presented by jurisdiction, 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 disaggregations where relevant. From the 12 indicators, the following observations can be made.

## During the antenatal period:

- In 2013, fewer than 1 in 8 women (34,000 or 11.2%) smoked in the first 20 weeks of pregnancy, a decrease from 12.7% in 2011, and around one-quarter quit smoking after the first 20 weeks of pregnancy. However, around 26,000 (73.6%) women who previously reported smoking continued to smoke after the first 20 weeks of pregnancy, an increase from 2011. Most jurisdictions saw little change in smoking rates after the first 20 weeks of pregnancy.
- The proportion of women receiving antenatal care in the first trimester remained steady in the majority of jurisdictions between 2007 and 2013 with almost 128,000 women or less than two-thirds of women receiving antenatal care in their first trimester in 2013.

## During labour and birth:

- The proportion of first-time mothers for whom labour was induced increased by 5 percentage points from 31.1% in 2004 to 36.1% in 2013. This may reflect increasing maternal age and the pre-existing medical conditions that may have prevented the spontaneous onset of labour.
- From 2004 to 2013, the rate of unassisted vaginal births decreased while assisted vaginal births increased.
- In 2013, about one-fifth of women (almost 11,000 or 18.4%) received an episiotomy in an unassisted birth, an increase of 2.2 percentage points from 16.2% in 2004. In 2013, around two-thirds of women (around 21,000 or 69.6%) received an episiotomy in an assisted birth, an increase of 8.9 percentage points from 60.7% in 2004.
- The rate of caesarean sections in first-time mothers increased from 25.3% in 2004 to 27.5% in 2013 an increase of 2.2 percentage points, consistent with increasing trends observed in other developed countries.
- Despite the increasing caesarean rate in 2013, around 1 in 8 women (about 3,400 or 13.5%) had a second birth vaginally after having their first birth by caesarean section, an increase of 0.4 percentage points from 13.1% in 2007.

## Birth outcomes:

- In 2013, around 1.3% of babies (3,800) had an Apgar score of less than 7 at 5 minutes, an increase of 0.4 percentage points from 0.9% in 2004, which may be associated with maternal risk factors such as increasing maternal age and increasing maternal obesity.
- There was a decrease in the proportion of small babies born at or after term by 0.5 percentage points from 2.1 percentage points in 2004 to 1.6% in 2013.





# 1 Introduction

The third report on the National Core Maternity Indicators (NCMIs) presents data for 12 indicators with updated data for 2010–2013. The NCMIs are clinical indicators of maternity care. A clinical indicator is defined as a measure of the clinical management and outcome of care, and should be based on evidence that confirms the underlying causal relationship between a particular process or intervention and health outcome (WHA 2007).

The NCMIs are constructed from data items from the AIHW National Perinatal Data Collection (NPDC), a national population-based collection that provides information on the pregnancy and childbirth of mothers, and the characteristics and outcomes of their babies.

These indicators are reported with clinical commentary from an Expert Commentary Group (ECG) that provided guidance for the report.

## 1.1 Background

### 1.1.1 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, recommended that Australia establish an enquiry process with annual benchmarking and/or reporting of performance indicators for obstetric and gynaecological practice and outcomes (KEMH 2001). In 2002, Australian Health Ministers agreed to support a collaborative project coordinated by the 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 (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 (now the Maternity Services Inter-Jurisdictional Committee) noted to the Australian Health Ministers’ Advisory Council 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. Women’s Hospitals 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 continuity for CMIP from the Australian Commission on Safety and Quality in Health Care to the Maternity Services Inter-Jurisdictional Committee (MSIJC). The MSIJC’s role was to provide consistency on national maternity 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 MSIJC established an Expert Working Group in 2009 to reaffirm the core maternity indicators. A list of 20 National Core Maternity Indicators was proposed by the Expert Working Group early in 2010 and this formed the basis for the work undertaken by the AIHW (see Table 1.1).

The development of core maternity indicators aligns with the first recommendation of the National Review of Maternity Services undertaken by the Chief Nursing 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).

## 1.2 Overview of the NCMI project

### 1.2.1 The NCMI project

During Stage 1 of the project a report was produced on the 10 NCMI's using the AIHW NPDC with clinical commentary from an ECG (AIHW NPESU & AIHW 2013).

During Stage 2, the AIHW developed, defined and assessed the feasibility of reporting on a further 8 NCMI's. Another component of Stage 2 was the creation of an online module through which the data could be accessed and provided to external stakeholders. These 10 indicators were available in a contemporary, user-driven online data portal in 2013 <<http://www.aihw.gov.au/ncmi/>>.

In 2015, the AIHW undertook Stage 3 on the NCMI project which included data development for 2 indicators, finalising the scope for 1 indicator based on the recommendations of the Stage 2 project, redesigning of the online data portal and facilitating the revised data resupply from Victoria for 2009–2011. See further <<http://www.aihw.gov.au/ncmi/>>.

Stage 4 of the project included:

- an update of indicators 1–10 online from 2004 to 2009, to include 2010 to 2013 perinatal data (see Table 1.1)
- a build of indicator 13 *Third and fourth degree tears for (a) all first births and (b) all births* into the NCMI suite of indicators and reporting on this indicator, noting that a nationally standardised data item for this indicator has been included in the 2013–14 Perinatal NMDS
- a build of indicator 15 *Women having their second birth vaginally whose first birth was by caesarean section* in the NCMI suite of indicators and reporting, noting that a nationally standardised data item for this indicator has been included in the 2014–15 Perinatal NMDS.

Table 1.1 provides a summary of the progress on all NCMI indicators from Stage 1 to Stage 3.

**Table 1.1: Status of NCMI's since 2012**

Indicator	Undertaken during	Status	Next steps
<b>Antenatal care</b>			
Smoking in pregnancy for all women giving birth (NCMI 1)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
Antenatal care in first trimester for all women giving birth (NCMI 2)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
<b>Labour and birth</b>			
<b>Selected women</b>			
Induction of labour for selected women giving birth for the first time (NCMI 5)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
Caesarean section for selected women giving birth for the first time (NCMI 6)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
Normal (non-instrumental) vaginal birth for selected women giving birth for the first time (NCMI 7)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
Instrumental vaginal birth for selected women giving birth for the first time (NCMI 8)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
<b>All women</b>			
Episiotomy for women having their first baby and giving birth vaginally assisted and unassisted (NCMI 3a and 3b)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
General anaesthetic for women giving birth by caesarean section (NCMI 9)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
Women having their second birth vaginally whose first birth was by caesarean section (NCMI 15)	Stages 2 and 3	Development and agreement on definitions, and assessment of the feasibility of standardising existing data for national reporting	This indicator will be added to the online data portal, with data for 2007–13.
One-to-one care in labour (NCMI 17)	Stage 2	Scoping and developmental work required to agree definitions and identify potential data sources and reporting measures	MSIJC recommended that further development of this indicator not be progressed.
Caesarean sections <39 completed weeks (273 days) without obstetric/medical indication (NCMI 18)	Stages 2 and 3	Development and agreement on definitions, and assessment of the feasibility of standardising existing data for national reporting	A data item on <i>Main reason for caesarean section</i> was added to the Perinatal DSS 2014–15. It is unclear when the item will move from the Perinatal DSS to the Perinatal NMDS. Once data become available, this indicator will be added to the online data portal. See data specifications in Chapter 3.

*(continued)*

**Table 1.1 (continued): Status of NCMI since 2012**

Indicator	Undertaken during	Status	Next steps
<b>Birth outcomes</b>			
Apgar score of less than 7 at 5 minutes for births at or after term (NCMI 4)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
Small babies among births at or after 40 weeks gestation (NCMI 10)	Stage 1	Updated data to 2013 <sup>(a)</sup>	
Third and fourth degree tears for (a) all first births and (b) all births (NCMI 13)	Stage 2 and 3	Development and agreement on definitions, and assessment of the feasibility of standardising existing data for national reporting	This indicator will be added to the online data portal, with data for 2013.
High-risk women undergoing caesarean section who receive appropriate pharmacological thromboprophylaxis (NCMI 11)	Stage 2	Scoping and developmental work required to agree definitions and identify potential data sources and reporting measures	The ECG recommended in 2013 that further development of this indicator not be progressed. All jurisdictions agreed with this recommendation.
Babies born $\geq 37$ completed weeks gestation admitted to a neonatal intensive care nursery or special care nursery for reasons other than congenital anomaly (NCMI 12)	Stages 2 and 3	Development and agreement on definitions, and assessment of the feasibility of standardising existing data for national reporting	Further data development is required. See summary of data development work in Chapter 3.
Blood loss of (i) $>1,000$ mL and $<1,500$ mL and (ii) $\geq 1,500$ mL during first 24 hours after the birth of the baby (i.e. major primary PPH) for (a) vaginal births and (b) caesarean sections (NCMI 14)	Stage 2	Development and agreement on definitions, and assessment of the feasibility of standardising existing data for national reporting	This data item was added to the Perinatal DSS 2014–15. It is unclear when the item will move from the Perinatal DSS to the Perinatal NMDS. Once data become available, this indicator will be added to the online data portal.
Separation of baby from the mother after birth for additional care (NCMI 16)	Stage 2	Scoping and developmental work required to agree definitions and identify potential data sources and reporting measures	MSIJC recommended that further development of this indicator not be progressed.
Supporting breastfeeding (NCMI 19)		Referred for further work <sup>(b)</sup>	
Models of care (NCMI 20)		Referred for further work <sup>(c)</sup>	The AIHW is consulting with the NPDC with plans to progress 2 data items to the Perinatal DSS 2017–18.
Skin-to-skin contact between mother and baby after birth (NCMI 21)	Stages 2 and 3		Further data development is required. See data specifications in Chapter 3.

(a) NCMI data portal at <http://www.aihw.gov.au/ncmi/>.

(b) Work on this indicator was referred to the Child Health and Wellbeing Subcommittee.

(c) Work on this indicator will be covered by the National Maternity Data Development Project.

### 1.3 Structure of this report

This report builds on both the indicator reporting and indicator development work previously undertaken during Stages 1–3 of this project.

Chapter 2 provides updated data for the original 10 NCMI indicators from 2010 to 2013. It also reports data for the 2 newly agreed indicators, NCMI 13 *Third and fourth degree tears for (a) all first births and (b) all births* and NCMI 15 *Women having their second birth vaginally whose first birth was by caesarean section*.

Chapter 3 gives an overview of past and anticipated indicator development for the NCMI. It provides detailed specifications for the 2 newly agreed indicators, NCMI 13 and 15, as well as draft specifications for 2 additional indicators, NCMI 18: *Caesarean section <39 weeks (273 days) without obstetric/medical indication* and NCMI 21: *Skin-to-skin contact between mother and baby after birth*. Progress in reaching agreement on the specifications of NCMI 12: *Babies born >37 completed weeks gestation admitted to a neonatal intensive care nursery or special care nursery for reasons other than congenital anomaly* is also detailed.

Appendix A contains information on data quality.

Appendix B contains a list of links to individual indicator specifications on METeOR.



## 2 Performance against the indicators

### 2.1 Reporting updated data for indicators

This chapter presents information on the performance of key aspects of maternity care nationally. The NCMI were formulated to assist in improving the quality of maternity services in Australia by establishing baseline data for monitoring and evaluating practice change. Data for 12 national core maternity indicators are provided in this chapter. Since 3 indicators have 2 parts, there are a total of 15 measures. The NCMI include both process-of-care measures (antenatal care in the first trimester, induction of labour, caesarean section) and outcome measures (smoking in pregnancy, Apgar score of less than 7 at 5 minutes, third and fourth degree perineal tears). Together, these measures provide insight into all stages of pregnancy care, covering the antenatal period, labour and birth, and birth outcomes (Table 2.1). Information from all these sources should be used to assist in evaluating changes maternity care over time.

This report is for 2004 to 2013, and includes data for the vast majority of women who gave birth in Australia over that period. The 10 measures previously reported have been updated with 2010–2013 perinatal data, while the 2 new measures (third and fourth degree tears for (a) all vaginal first births, and (b) all vaginal births), and women having their second birth vaginally whose first birth was by caesarean section are reported for the first time. Data are reported for each measure for all periods with acceptable data quality permits.

The indicator specifications outlining the disaggregation and data items used for the NCMI have been recommended by National Health Information Standards and Statistics Committee (NHISSC) and endorsed by the National Health Information and Performance Principal Committee (NHPPC). The relevant disaggregations are reported for each indicator. For instance, the measure on small babies is disaggregated by the sex of the baby because female babies tend to be smaller than male babies. No other indicator is disaggregated by the sex of the baby. This report contains all of the disaggregations included in the endorsed set of specifications.

Data quality is examined more thoroughly in Appendix A.

Detailed data visual analytics and tables for each indicator will be updated online <<http://www.aihw.gov.au/ncmi>>. Specifications for the indicators are detailed in METeOR <<http://meteor.aihw.gov.au/content/index.phtml/itemId/613171>>. Links to individual indicator specifications can be found in Appendix B.

## Summary of the NCMI trends

Table 2.1. summarises the most recent data compared to its baseline figure for each indicator.

**Table 2.1: Trends for NCMI measures**

No.	Description	First data	Baseline proportion	Proportion in 2013	Numerator in 2013	Denominator in 2013
<b>A Antenatal period</b>						
A1a	Smoking in the first 20 weeks of pregnancy for all women giving birth	2011	12.7%	11.2%	34,056	304,777
A1b	Smoking after the first 20 weeks of pregnancy for all women who gave birth and reported smoking during pregnancy	2011	71.4%	73.6%	25,729	34,966
A2	Antenatal care in the first trimester for all women giving birth <sup>(a)</sup>	2007	64.2%	62.5%	127,572	203,955
<b>B Labour and birth</b>						
B1	Induction of labour for selected women giving birth for the first time	2004	31.1%	36.1%	32,818	90,960
B2	Unassisted (non-instrumental) vaginal birth for selected women giving birth for the first time	2004	51.9%	47.1%	42,868	90,960
B3	Assisted (instrumental) vaginal birth for selected women giving birth for the first time	2004	22.8%	25.3%	23,023	90,960
B4a	Episiotomy for women having their first baby and giving birth vaginally unassisted (non-instrumental)	2004	16.2%	18.4%	10,782	58,490
B4b	Episiotomy for women having their first baby and giving birth vaginally assisted (instrumental)	2004	60.7%	69.6%	20,739	29,808
B5	Caesarean section for selected women giving birth for the first time	2004	25.3%	27.5%	25,054	90,960
B6	Women having their second birth vaginally whose first birth was by caesarean section	2007	13.1%	13.6%	3,388	25,038
B7	General anaesthetic for women giving birth by caesarean section	2007	8.2%	6.4%	6,343	99,862
<b>C Birth outcomes</b>						
C1a	Third and fourth degree tears for all vaginal first births	2013	5.2%	5.2%	4,597	88,298
C1b	Third and fourth degree tears for all vaginal births	2013	3.0%	3.0%	6,074	204,860
C2	Apgar score of less than 7 at 5 minutes for births at or after term	2004	0.9%	1.3%	3,775	282,634
C3	Small babies among births at or after 40 weeks gestation	2004	2.1%	1.6%	1,805	112,908

(a) New South Wales data was excluded for the analysis of this indicator.

## Results

**Nationally**, 11.2% of women who gave birth in 2013 reported smoking tobacco in the first 20 weeks of pregnancy (Figure 2.1). In 2013 the proportion ranged from 6.1% in the Australian Capital Territory to 23.0% in the Northern Territory.

**Trend** showed a decrease in the proportion of women who smoked tobacco in the first 20 weeks of pregnancy, declining from 12.7% in 2011 to 11.2% in 2013.

**Remoteness** of the mother's area of residence was associated with differences in the proportion of women who smoked. The proportion ranged from 8.4% in *Major cities* to 36.8% in *Very remote areas*.

**Indigenous mothers** smoked during the first 20 weeks of pregnancy at a higher rate (46.1%) than non-Indigenous mothers (9.7%).

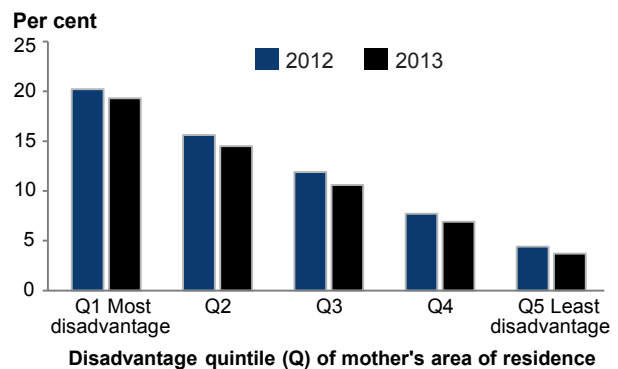
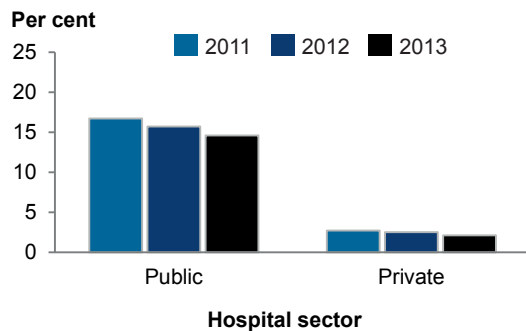
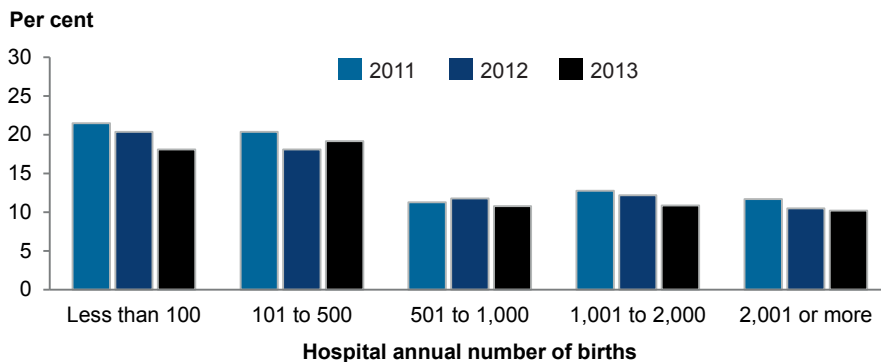
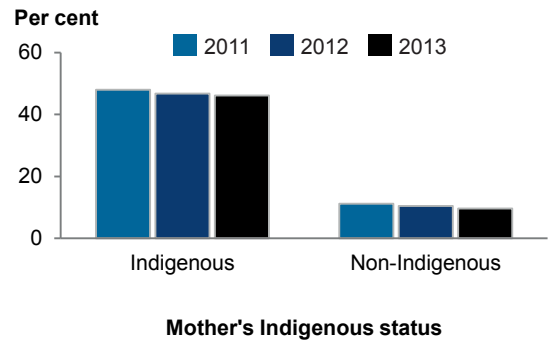
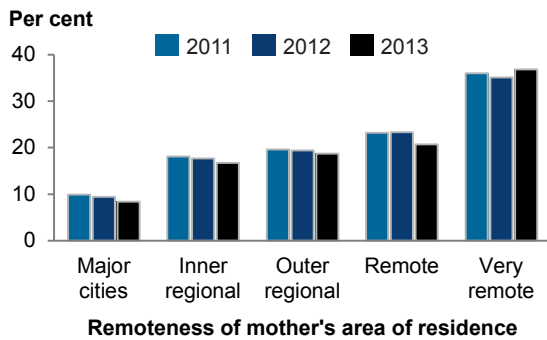
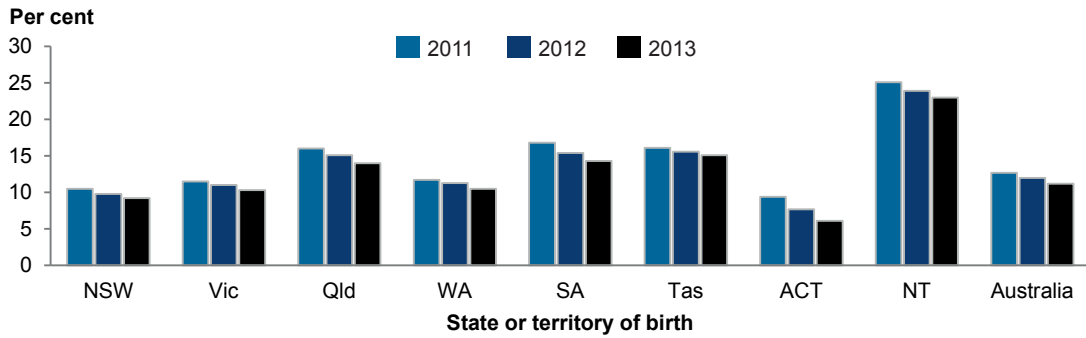
### Hospital characteristics

- A higher proportion of women who gave birth at smaller hospitals smoked during the first 20 weeks of pregnancy than women who gave birth at larger hospitals. The proportion ranged from 19.2% in hospitals with 101 to 500 births annually to 10.2% in hospitals with over 2,000 births annually.
- The proportion of women who smoked was higher in public (14.6%) than in private hospitals (2.1%).

**Socioeconomic status** of the mother's area of residence was associated with differences in the proportion of women who smoked, ranging from 3.7% in the areas with least disadvantage to 19.3% in areas with the most disadvantage.

## Clinical commentary

- Women who smoke tobacco during pregnancy are more likely to experience pre-term birth, placental complications and perinatal death of their baby. 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 gestation onwards. Late fetal growth restriction predisposes the baby to hypertension and diabetes in adulthood. Sudden infant death syndrome, childhood diabetes and childhood obesity have also been linked with exposure to tobacco during fetal development.
- Smoking during pregnancy is a modifiable behavioural risk factor for adverse outcomes in pregnancy. Cessation of smoking in the early part of pregnancy can reduce many of the risks that arise from tobacco smoking.
- There are clear associations between smoking in pregnancy, age of the mother, remoteness and disadvantage evident in the results presented. In 2013, 34% of teenage mothers reported smoking during pregnancy, compared with 8% of mothers aged 40 years and over (AIHW 2015). Sociodemographic profiles of women who give birth in public and private hospitals need to be taken into account when considering the higher rates of smoking in pregnancy for women giving birth in public hospitals.



**Notes**

1. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.
2. Socioeconomic status for 2012 onwards is assigned on the ABS 2011 Socio-Economic Indexes for Areas (SEIFA) Index of Relative Disadvantage (IRSD). Data for previous years will not be reported, due to the release of SEIFA IRSD 2011, which is based according to the new ABS remoteness structure (ASGS).

Source: AIHW National Perinatal Data Collection.

**Figure 2.1: Smoking in the first 20 weeks of pregnancy for all women giving birth, 2011–2013**

## A1b. Smoking after the first 20 weeks of pregnancy for all women who gave birth and reported smoking during pregnancy

## Results

**Nationally**, in 2013, 25,729 women smoked after the first 20 weeks of pregnancy (Figure 2.2). This equates to 73.6% of women who gave birth and reported smoking at any time during pregnancy and smoked after the first 20 weeks of pregnancy, with about 26% who ceased smoking. In 2013, the proportion of women who continued to smoke ranged from 58.2% in Victoria to 90.3% in Tasmania.

**Trend** showed an increase in the proportion of women who smoked tobacco after the first 20 weeks of pregnancy who smoked at any time during pregnancy, increasing from 71.4% in 2011 to 73.6% in 2013. This national trend may be due to the increasing proportions of pregnant women who continue to smoke after the first 20 weeks of pregnancy in Victoria (Vic DHHS 2015), Tasmania, and Western Australia. Across all years reported here, the proportion of pregnant women who continued to smoke in Victoria is much lower when compared to other jurisdictions. The apparent increase in Victoria in women smoking beyond 20 weeks' gestation might be related to improved ascertainment, as the data items for smoking have been introduced in Victoria over the last few years.

**Remoteness** of the mother's area of residence was associated with differences in the proportion of women who smoked after the first 20 weeks of pregnancy. The proportion ranged from 68.2% in *Major cities* to 85.8% in *Very remote areas*.

**Indigenous mothers** smoked after 20 weeks of pregnancy at a higher rate (86.2%) than non-Indigenous mothers (71.1%).

### Hospital characteristics

- There were differences in the proportion of women who smoked after 20 weeks of pregnancy in hospitals with a different number of births annually. The proportion ranged from 69.7% in hospitals with over 2,000 births annually to 80.4% in hospitals with 101–500 births.
- The proportion of women who smoked was higher in public hospitals (74.3%) than in private hospitals (61.0%).

**Socioeconomic status** of the mother's area of residence was associated with differences in the proportion of women who smoked, ranging from 62.2% in the areas with least disadvantage to 79.0% in areas of the most disadvantage.

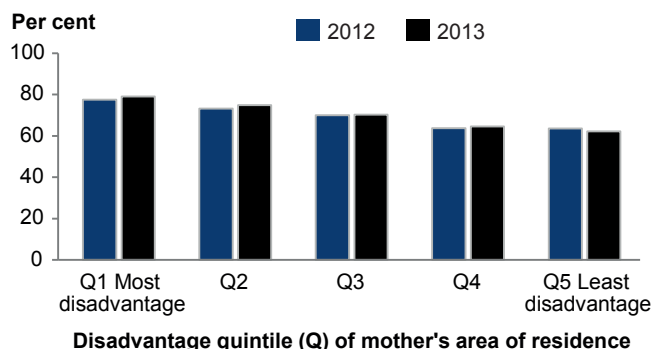
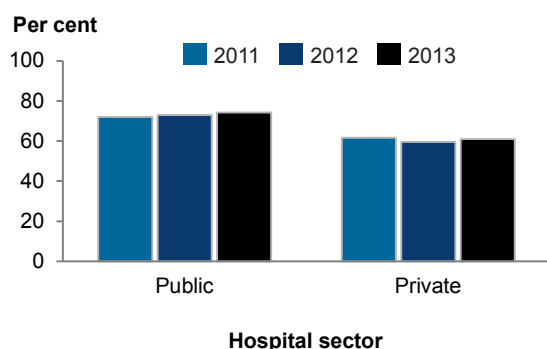
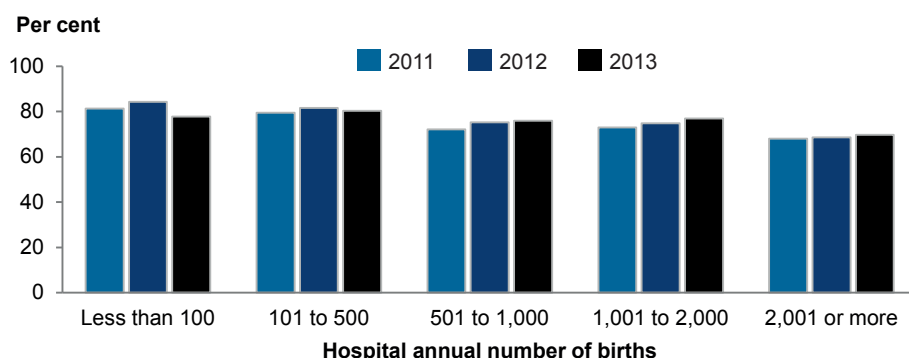
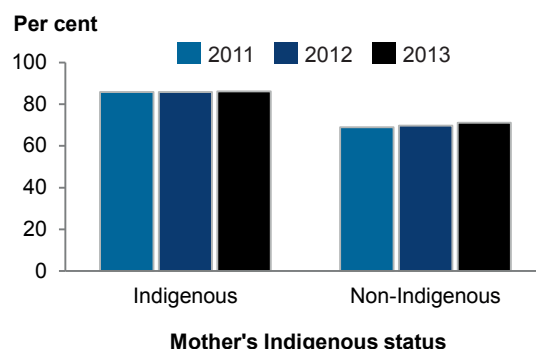
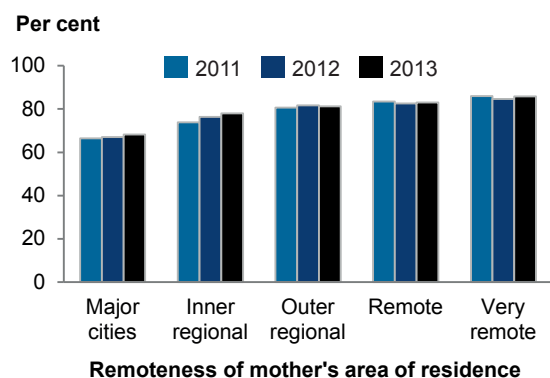
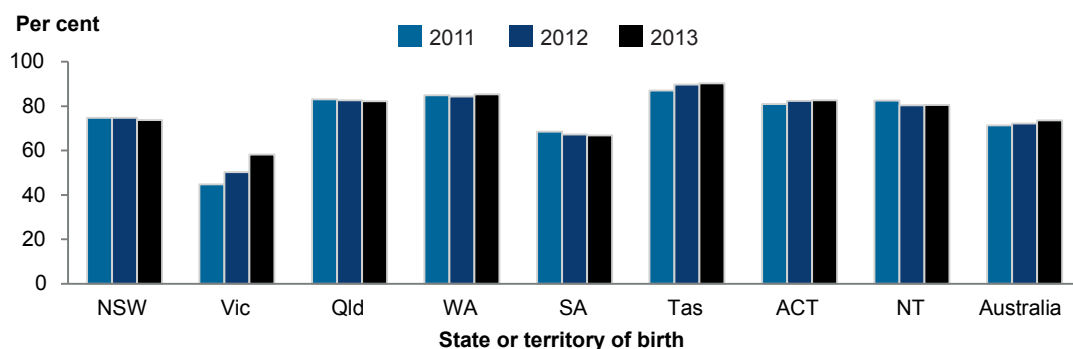
## Clinical commentary

The previous measure examines the proportion of pregnant women who smoked during the first 20 weeks of pregnancy, whereas this indicator looks at the proportion of those women who continued to smoke during the second 20 weeks of pregnancy.

Results for smoking at any time in pregnancy are available since 2004, providing a longer period over which to assess changes.

**Nationally**, 11.5% of women who gave birth in 2013 reported smoking tobacco.

**Trend** showed a decrease in the proportion of women who gave birth who reported smoking tobacco, declining from 17.4% in 2005 to 11.5% in 2013. The proportion declined in all jurisdictions, and ranged from 23.1% in the Northern Territory to 6.1% in the Australian Capital Territory.



**Notes**

1. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS Australian Statistical Geography Standard (ASGS) in 2011.
2. Socioeconomic status for 2012 onwards is assigned on the ABS 2011 Socio-Economic Indexes for Areas (SEIFA) Index of Relative Disadvantage (IRSD). Data for previous years will not be reported, due to the release of SEIFA IRSD 2011, which is based according to the new ABS remoteness structure (ASGS).

Source: AIHW National Perinatal Data Collection.

**Figure 2.2: Smoking after the first 20 weeks of pregnancy for all women who reported smoking at any time during their pregnancy, 2011–2013**

## Results

**Nationally** (excluding New South Wales), 62.5% of women giving birth received antenatal care in the first trimester (Figure 2.3). The proportion ranged from 40.8% in the Australian Capital Territory to 86.3% in Tasmania.

**Trend** showed a decrease nationally, from 62.9% in 2010 when all 8 jurisdictions reported for the first time to 62.5% in 2013. Increases in the proportion of pregnant women receiving antenatal care in the first trimester were observed in 4 jurisdictions from 2010 to 2013. Comparisons over time and between jurisdictions should be interpreted with extreme caution as there may be changes to the definition of antenatal care which may influence the interpretation of these results.

**Remoteness** of the mother's area of residence was associated with differences in the proportion of women who received antenatal care in the first trimester. The proportion (excluding New South Wales) ranged from 58.9% in *Inner regional* to 73.6% in *Outer regional* areas.

**Indigenous mothers** were less likely to receive antenatal care in the first trimester (53.3%) than non-Indigenous mothers (63.0%) (excluding New South Wales).

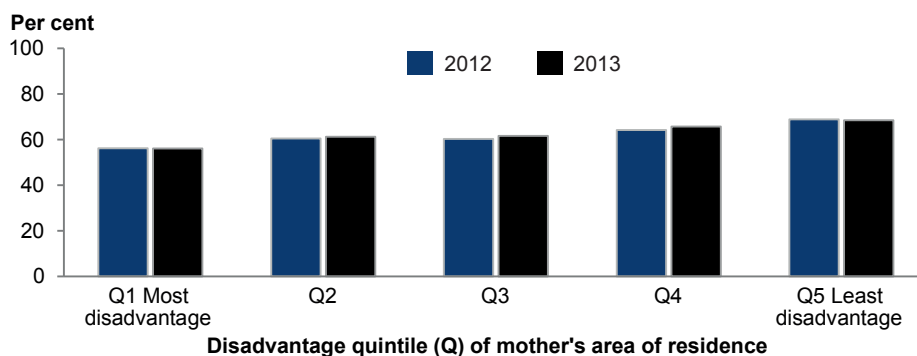
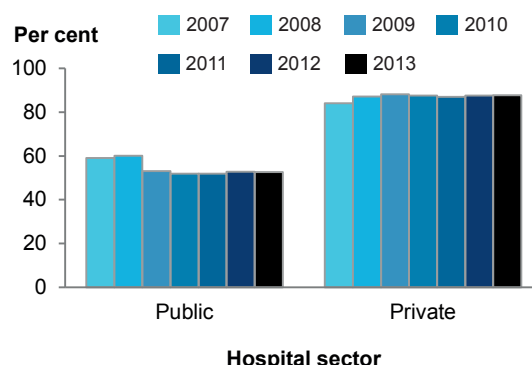
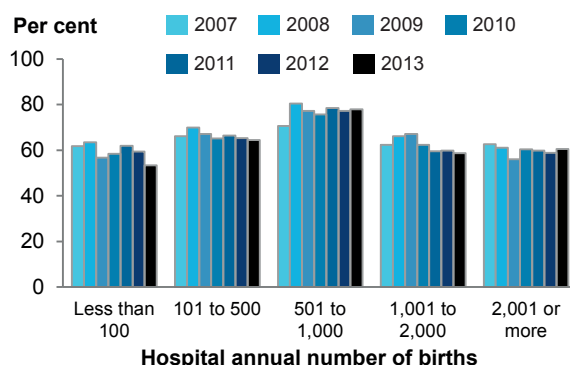
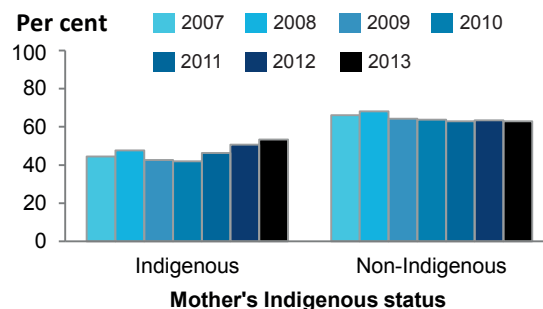
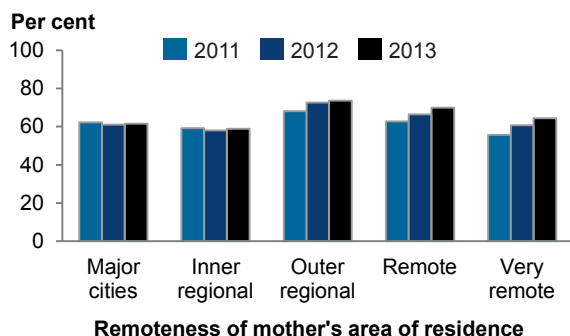
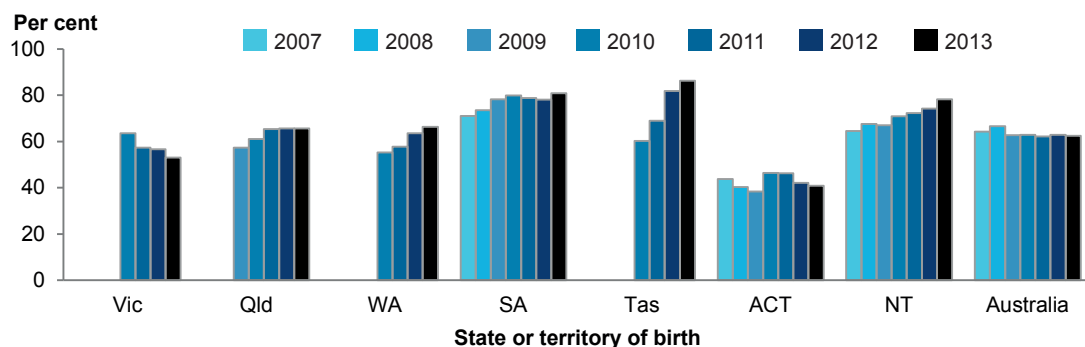
### Hospital characteristics

- The proportion (excluding New South Wales) of mothers who had antenatal care in the first trimester ranged from 53.4% at hospitals with less than 100 births annually to 78.0% at hospitals with 501 to 1,000 births annually.
- A higher proportion (excluding New South Wales) of women at private hospitals received antenatal care in the first trimester (87.7%) than those at public hospitals (52.6%).

**Socioeconomic status** of the mother's areas of residence was associated with differences in antenatal care with 56.1% in the most disadvantaged areas to 68.5% in the least disadvantaged areas (excluding New South Wales).

## 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. Commencing regular antenatal care in the first trimester (before 14 weeks gestational age) is associated with better maternal health in pregnancy, fewer interventions in late pregnancy and positive child health outcomes. To be accessible, antenatal care needs to be equitable, affordable and available to all women.
- The higher proportion of women who gave birth in the private sector who received antenatal care in the first trimester may reflect the need to book into some private hospitals early, and be indicative of the more advantageous demographic profile of these women, compared with those who gave birth in public hospitals.
- In 2010 there was a national workshop with stakeholders from midwifery, obstetric, perinatal data managers and other interested parties to scope, develop and define data items for antenatal care visits. This consultation may have affected recording practices from 2010 onwards.
- New South Wales has been excluded from the national total due to a documented change in collection practice from 'Duration of pregnancy at first antenatal visit' to 'Duration of pregnancy at first comprehensive booking or assessment by clinician' (HealthStat NSW 2016). As the newer definition is more stringent than what would have been previously defined, the proportion of mothers who commenced pre-natal care in 2011 is lower than in previous years (HealthStat NSW 2016).



**Notes**

1. Australia total in this time series excludes data from New South Wales due to changes in recording practice. See the following link for details: [http://www.healthstats.nsw.gov.au/Indicator/mum\\_antegage/mum\\_antegage\\_lhn\\_snap](http://www.healthstats.nsw.gov.au/Indicator/mum_antegage/mum_antegage_lhn_snap).
  2. Caution should be used when interpreting these results. There was no standardised collection across jurisdictions for the data used to derive this indicator.
  3. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.
  4. Socioeconomic status for 2012 onwards is assigned on the ABS 2011 Socio-Economic Indexes for Areas (SEIFA) Index of Relative Disadvantage (IRSD). Data for previous years will not be reported, due to the release of SEIFA IRSD 2011, which is based according to the new ABS remoteness structure (ASGS).
  5. Data were unavailable for Victoria, Western Australia and Tasmania between 2007 and 2009, and Queensland between 2007 and 2008.
- Source: AIHW National Perinatal Data Collection.

**Figure 2.3: Antenatal care in the first trimester for all women giving birth, 2007–2013**

## Results

**Nationally**, labour was induced for 36.1% of selected women giving birth for the first time (Figure 2.4). The proportion ranged from 31.2% in Queensland to 43.1% in Tasmania. 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. The proportion of women who compose selected women is 29.8% of the number of women who gave birth in 2013.

**Trend** showed a steady increase in the proportion of women whose labour was induced, increasing from 31.1% in 2004 to 36.1% in 2013.

**Remoteness** of mother's usual residence was similar in most remoteness areas, and ranged from 34.9% in *Outer regional areas* to 37.7% in *Very remote areas*.

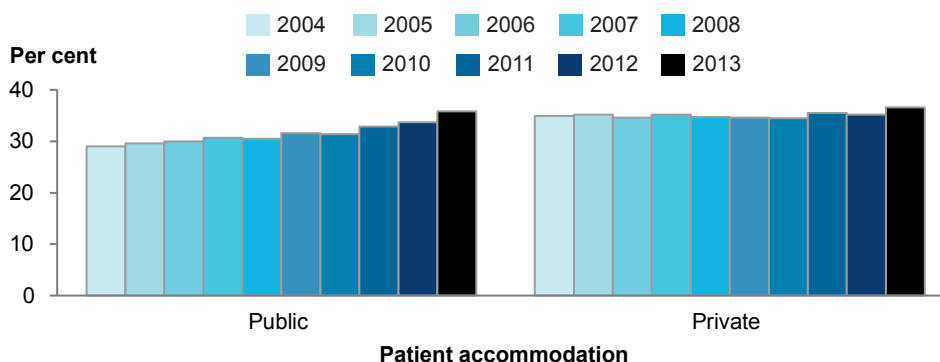
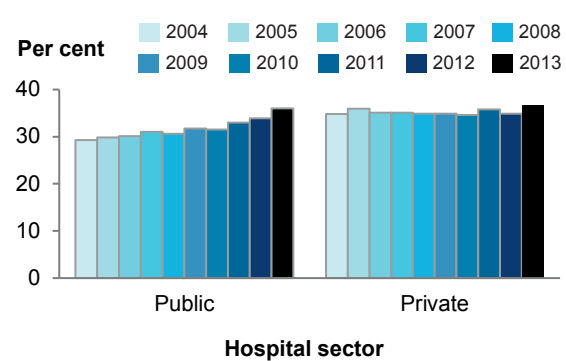
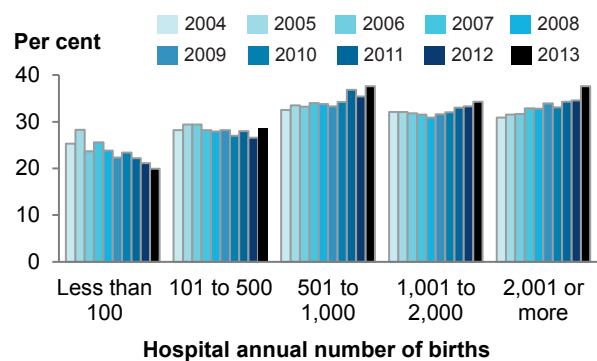
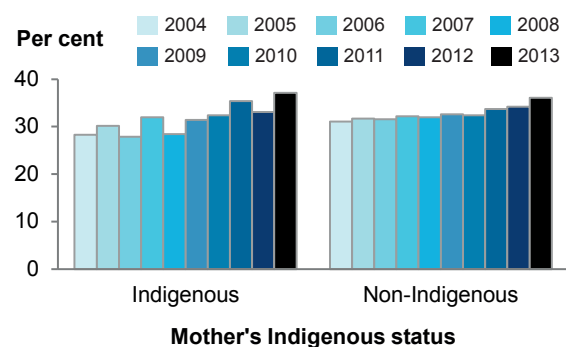
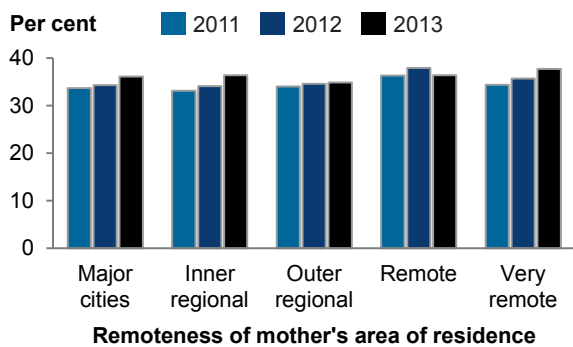
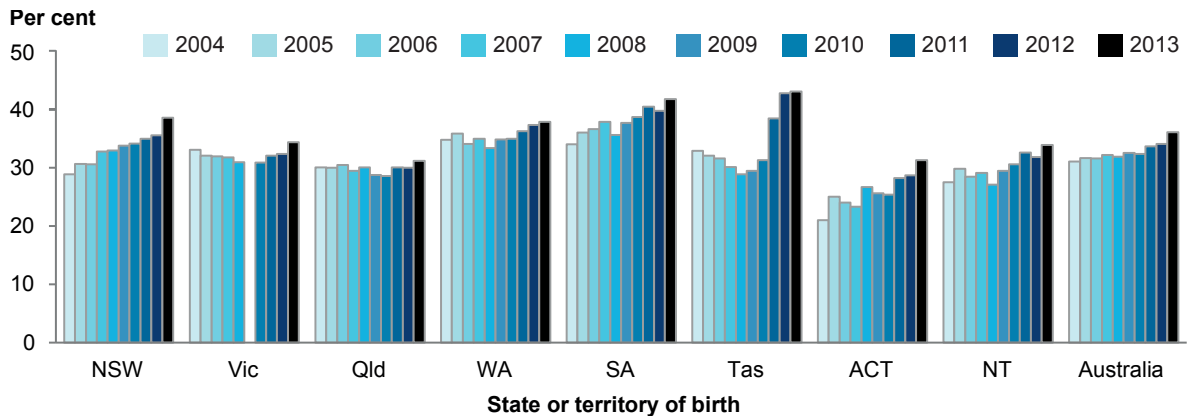
**Indigenous mothers** were slightly more likely to have labour induced (37.1%) than non-Indigenous mothers (36.1%) in 2013. In previous years, however, non-Indigenous mothers were more likely to have labour induced.

### Hospital characteristics

- The proportion of mothers who had labour induced was 36.0% at public hospitals and 36.7% at private hospitals. The proportion of women whose labour was induced increased at public hospitals, but was comparatively stable at private hospitals.
- The proportion of mothers who had labour induced ranged from 19.9% at hospitals with less than 100 births annually to 37.6% at hospitals with 501–1,000 births and those with over 2,000 births.

## Clinical commentary

- Induction of labour is an intervention to end the pregnancy before the spontaneous onset of labour that may be recommended for women with pre-eclampsia, diabetes mellitus, pregnancies complicated by restricted fetal growth and other medical conditions. There is debate about acceptable use of induction of labour at term for non-medical conditions. Induction of labour is associated with risk of fetal distress, uterine hyper-stimulation and postpartum haemorrhage and can be the start of a cascade of further medical interventions.
- The choice of larger hospitals, particularly those with tertiary-level facilities, for the care of more complex cases and transfers of women who develop complications during antenatal care to these hospitals may result in an increase of the case complexity and consequently the use of induction of labour in these hospitals.
- Differences in the rates of induction across the states and territories are not readily explained and may reflect differences in policy, clinical workforce and access to local care. The reason for increased rates of induction over time in public sector hospitals is not apparent.



**Notes**

1. Data for criteria to select women were not available from Victoria in 2009.
2. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.

Source: AIHW National Perinatal Data Collection.

**Figure 2.4: Induction of labour for selected women giving birth for the first time, 2004–2013**

## Results

**Nationally**, 47.1% of selected women giving birth for the first time had an unassisted (non-instrumental) vaginal birth (Figure 2.5). The proportion ranged from 41.2% in Western Australia to 53.0% in the Northern Territory. Selected women, amounting to 29.8% of the number of women who gave birth in 2013, 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.

**Trend** showed a decrease over time in the proportion of women giving birth for the first time who had an unassisted birth, from 51.9% in 2004 to 47.1% in 2013.

**Remoteness** of the mother's area of residence was associated with differences in the proportion of women giving birth for the first time who had an unassisted birth, which ranged from 45.9% in *Major cities* to 53.7% in *Remote areas*. *Inner regional* and *Very remote* areas showed the largest declines between 2011 and 2013.

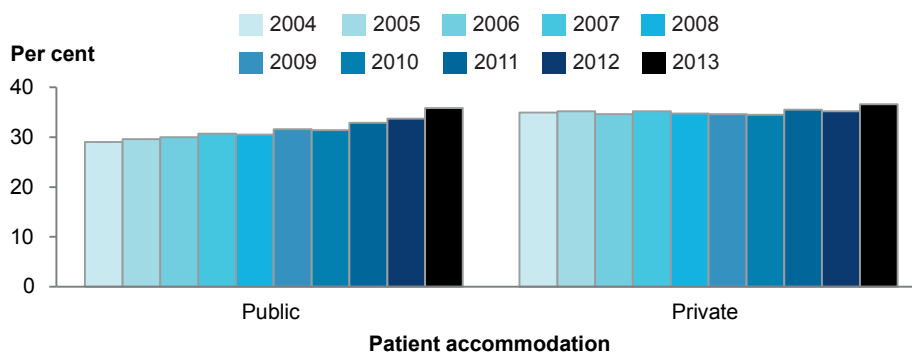
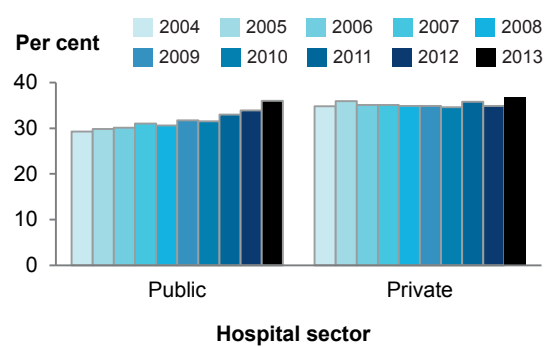
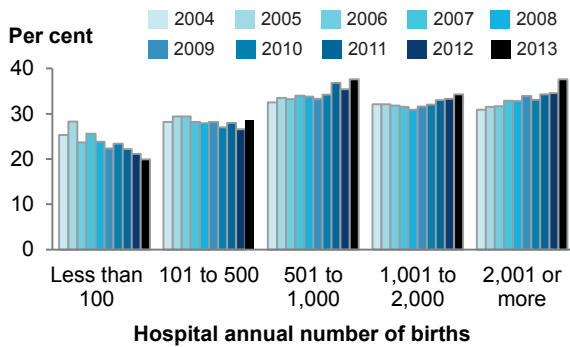
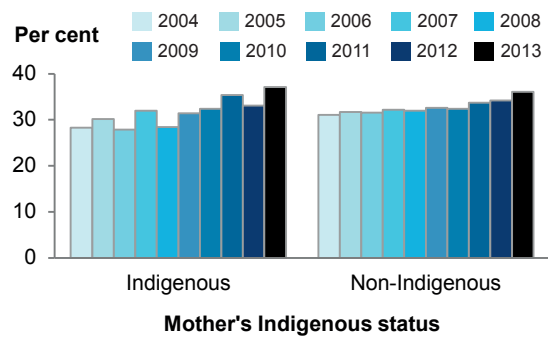
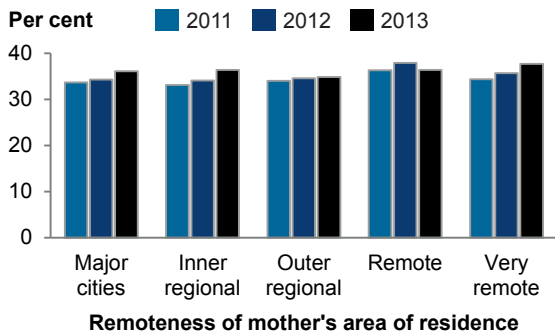
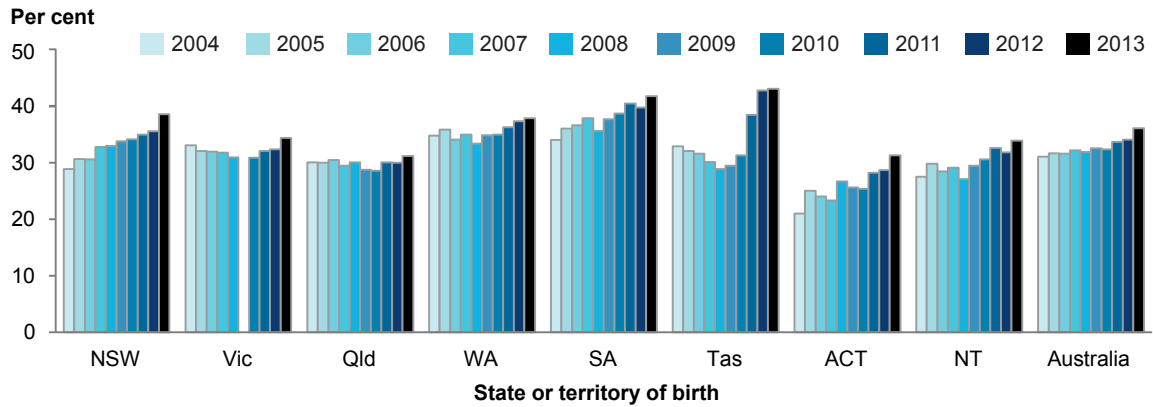
**Indigenous mothers** giving birth for the first time were more likely to have an unassisted birth (53.9%) than non-Indigenous mothers (47.0%).

## Hospital characteristics

- Hospitals with less than 100 births and 101–500 births annually had a higher proportion of women who had an unassisted birth (68.9% and 54.8%, respectively) than hospitals with more births.
- The proportion of mothers giving birth for the first time who had a non-instrumental birth in public hospitals (51.9%) was much higher than the proportion of women giving birth for the first time in private hospitals (34.5%).

## Clinical commentary

- The primary goal for all maternity carers is to preserve the physical and psychological health of the mother and the baby and ensure a safe birth. Unassisted vaginal birth is seen by many as the ideal standard as women tend to have fewer postnatal complications and are better able to undertake the care of their new babies.
- The younger age structure of selected women giving birth in public sector compared with private sector hospitals may contribute to the higher rates of unassisted birth for selected women in public hospitals compared with those giving birth in private hospitals.
- Smaller hospitals will not have access to the facilities needed for the care of more complex cases and will transfer the care of women who develop complications during pregnancy and in labour. Hospitals that have centres promoting unassisted and non-interventional births will attract women who also have this as their preference. This will result in relatively more unassisted births in these hospitals.



**Notes**

1. Data were unavailable for this indicator for Victoria in 2009.
2. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.

Source: AIHW National Perinatal Data Collection.

**Figure 2.5: Unassisted (non-instrumental) vaginal birth for selected women giving birth for the first time, 2004–2013**

## Results

**Nationally**, 25.3% of selected women giving birth for the first time had an assisted (instrumental) birth (Figure 2.6). The proportion was lowest in the Northern Territory (19.4%) in 2013. Selected women, amounting to 29.8% of the number of women who gave birth in 2013, 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.

**Trend** showed that the proportion of women giving birth for the first time who had an assisted birth increased from 22.8% in 2004 to 25.3% in 2013.

**Remoteness** of the mother's usual residence was associated with differences in the proportion of mothers giving birth for the first time who had an assisted birth. The proportion ranged from 19.4% in *Remote areas* to 26.1% in *Major cities*.

**Indigenous mothers** giving birth for the first time were less likely to have an assisted birth (18.4%) than non-Indigenous mothers (25.5%).

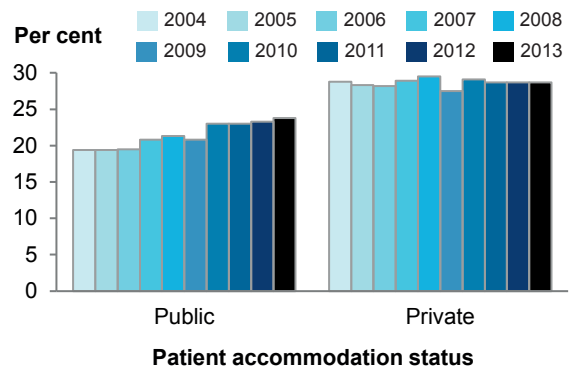
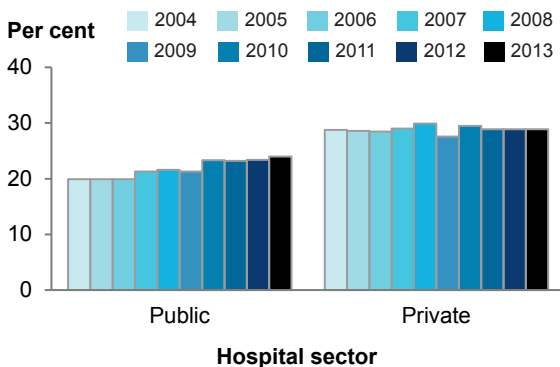
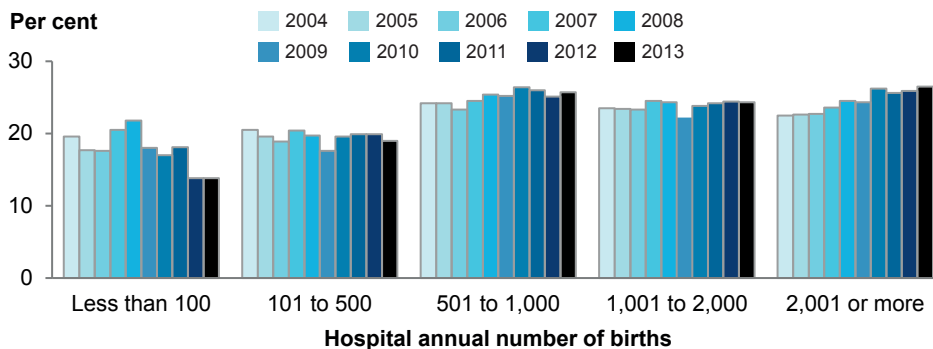
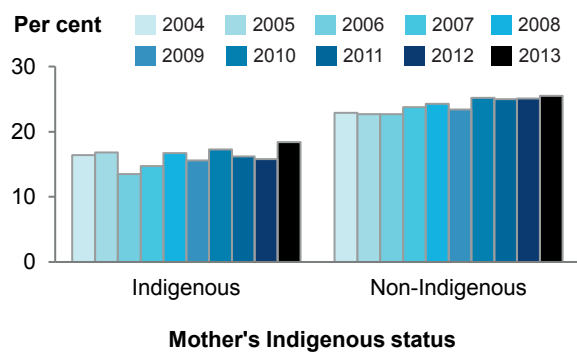
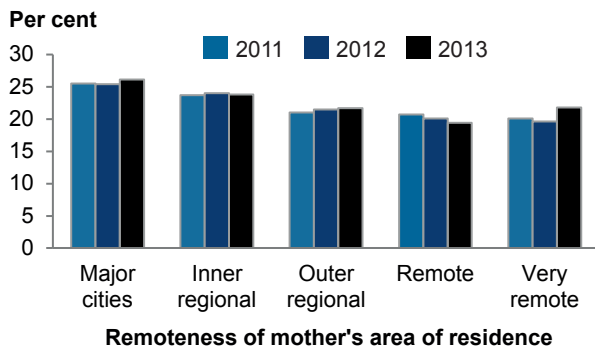
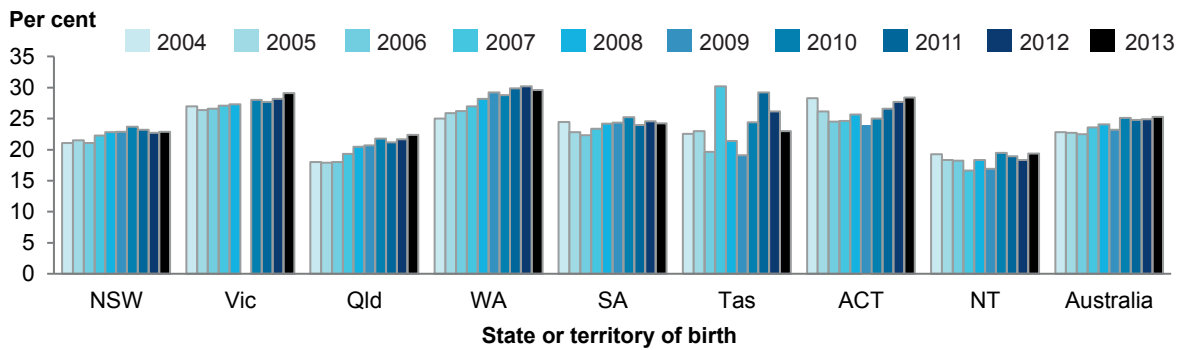
### Hospital characteristics

- At private hospitals, 28.9% of mothers giving birth for the first time had an assisted birth, compared with 24.0% at public hospitals.
- The proportion of mothers giving birth for the first time who had an assisted birth ranged from 13.8% at hospitals with 100 births or less annually to 26.5% at hospitals with over 2,000 births.

**Mothers in private accommodation** giving birth for the first time were more likely (28.7%) to have an assisted birth than those in public accommodation (23.8%).

## Clinical commentary

- Instruments such as vacuum or forceps can be used to assist a mother at the end of labour or expedite the birth if the baby is showing signs of distress. Instrument use is associated with both short-term and long-term complications for the mother and the baby, some of which can be serious. Judicious use of instruments is needed.
- The function of larger hospitals, particularly those with tertiary-level facilities in the public sector, which are predominantly located in major cities, includes the care of more complex cases and related transfers of women who develop complications during antenatal care and in labour. This will result in an increase of the case complexity and consequently the use of instruments for births in these hospitals.
- Assisted vaginal birth is progressively more common among older women. The higher rates of assisted vaginal birth among selected women who gave birth in the private sector may in part be due to their older ages compared with selected women who gave birth in public sector hospitals. The reasons for jurisdictional differences in the rates of assisted vaginal birth are not immediately apparent but may reflect differences in policy, clinical workforce and access to local care. The higher rates of assisted vaginal birth in hospitals with 501–1,000 births compared with other hospitals may reflect the larger proportion of private hospitals in this hospital size category. The practice is more common in private hospitals.
- The higher rates of non-Indigenous mothers having an assisted vaginal birth compared with Indigenous mothers may reflect the higher use of private hospitals/private accommodation by non-Indigenous mothers.



**Notes**

1. Data for Victoria were unavailable for this indicator in 2009.
2. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.

Source: AIHW National Perinatal Data Collection.

**Figure 2.6: Assisted vaginal birth for selected women giving birth for the first time, 2004–2013**

### B4a. Episiotomy for women having their first baby and giving birth vaginally unassisted (without use of instruments) to assist the birth

#### Results

**Nationally**, 18.4% of women having their first baby who gave birth vaginally without use of instruments to assist the birth had an episiotomy (Figure 2.7). An episiotomy is an incision made in the perineum (the tissue between the vaginal opening and the anus) during childbirth.

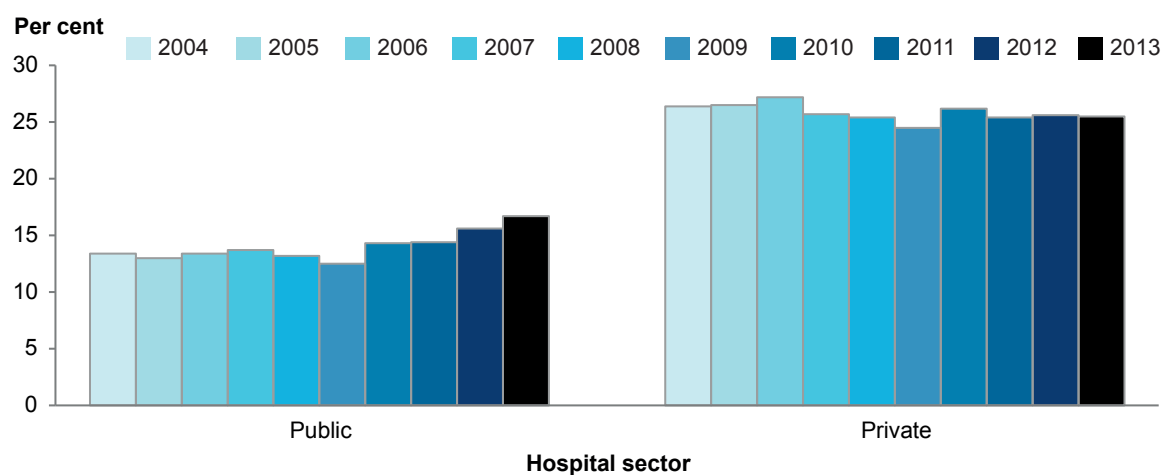
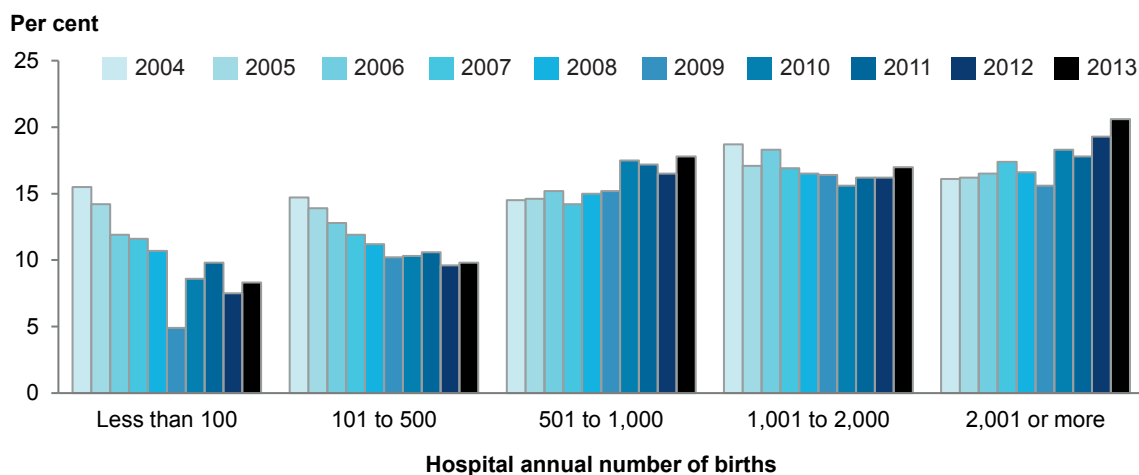
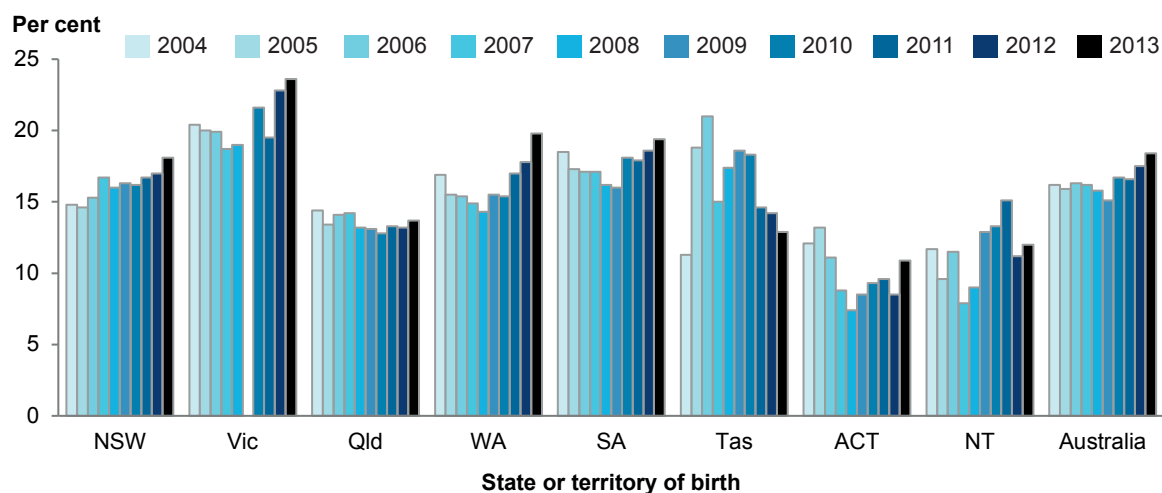
**Trend** showed an increase from 16.2% of women having their first baby vaginally without instruments who had an episiotomy in 2004 to 18.4% in 2013. The proportion increased by 3.3 percentage points between 2009 and 2013.

#### Hospital characteristics

- Women having their first baby vaginally without instruments were less likely to have an episiotomy at a hospital with 500 births or less annually than at a hospital with more births annually. The proportion ranged from 8.3% at hospitals with 100 or less births to 20.6% at hospitals with over 2,000 births.
- Women having their first baby vaginally without instruments were more likely to have an episiotomy in a private hospital (25.5%) than women in a public hospital (16.7%).

#### Clinical commentary

- Episiotomy can shorten the second stage of labour, is easier than a tear to repair but comes at the cost of more extensive trauma to the perineum than might otherwise have been experienced. Perineal trauma can result in discomfort and pain, bleeding, infection, urinary incontinence, interfere with breastfeeding and result in painful sexual intercourse.
- The most recent best evidence from meta-analysis of randomised controlled trials confirms that selective use of episiotomy is better practice than routine use of episiotomy. Routine episiotomy was associated with more vaginal and perineal trauma overall, particularly posterior perineal trauma, more suturing and more complications at 7 days. Restricted selective use of episiotomy may reduce the level of pain, urinary incontinence, painful sex or severe perineal trauma.
- There is no immediate explanation for the differences in the rates of episiotomy for women having a vaginal birth without instruments between jurisdictions or the higher rates among women who gave birth in a private hospital.



**Notes**

1. Data for Victoria were unavailable for this indicator in 2009.
2. Western Australia proportions for the data item used for this indicator did not include women who had episiotomy extending to third and fourth degree perineal tear for 2013. However, this does not apply for years 2007 to 2012.

Source: AIHW National Perinatal Data Collection.

**Figure 2.7: Episiotomy for women having their first baby and giving birth vaginally without the use of instruments to assist birth, 2004–2013**

## B4b. Episiotomy for women having their first baby and giving birth vaginally (assisted with the use of instruments)

### Results

**Nationally**, 69.6% of women having their first baby and giving birth vaginally with the use of instruments to assist birth (assisted birth) had an episiotomy (Figure 2.8). The proportion varied by jurisdiction in 2013, from 49.7% in the Australian Capital Territory to 77.8% in Victoria.

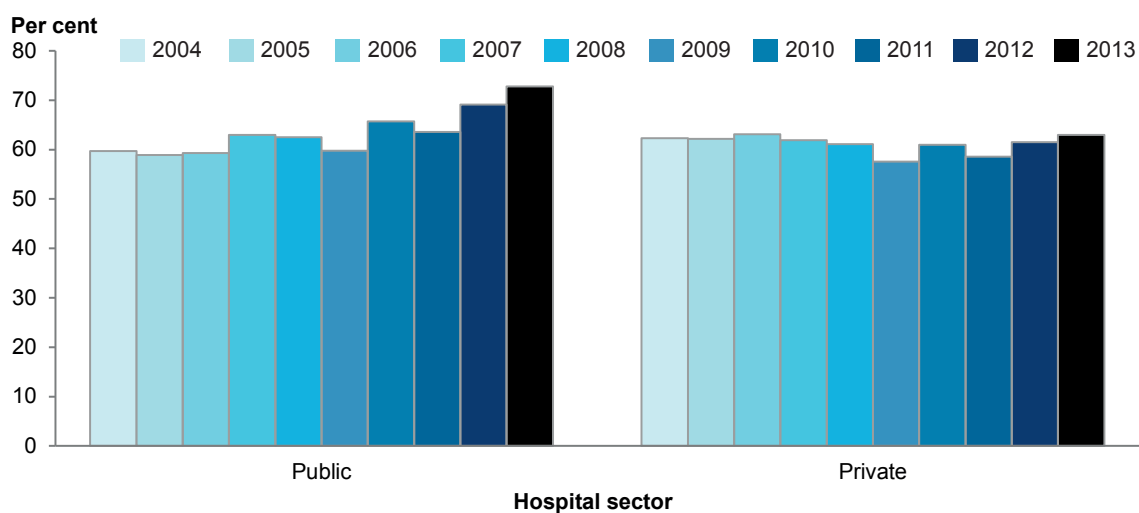
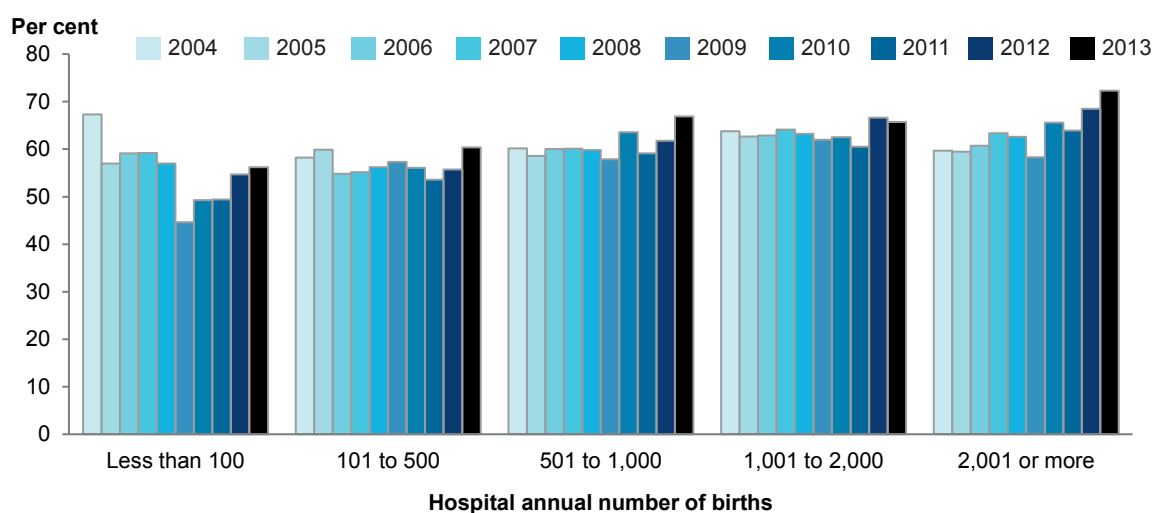
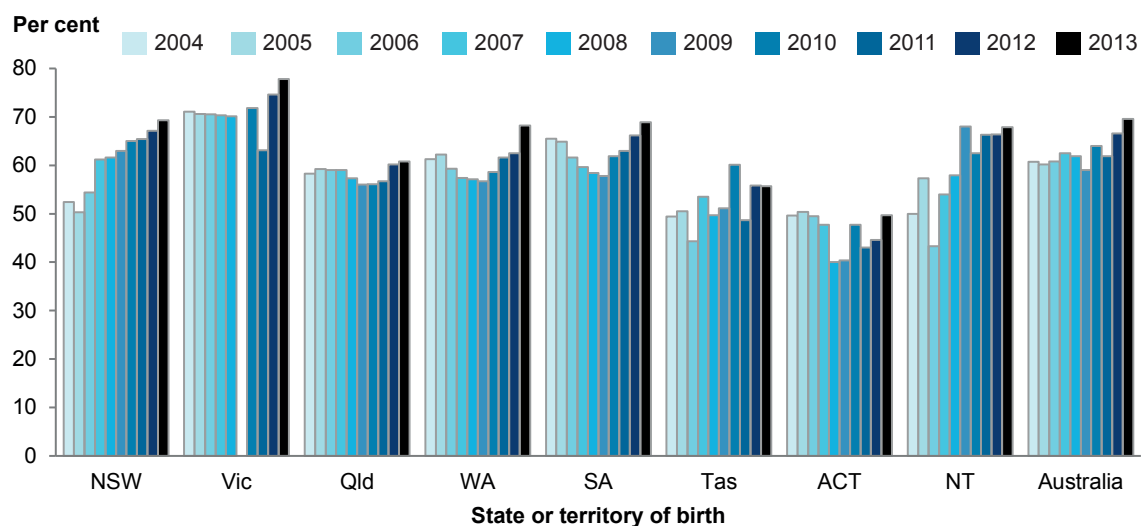
**Trend** showed an increase from 60.7% of women having their first baby instrumentally having an episiotomy in 2004 to 69.6% in 2013.

### Hospital characteristics

- The proportion of women having their first baby and giving birth vaginally with instruments who had an episiotomy tended to be higher at hospitals with more births. The proportion ranged from 56.2% at hospitals with 100 or less births annually to 72.3% at hospitals with over 2,000 births annually. In 2004, differences between hospitals with different numbers of births were less substantial. Over time, however, the proportion decreased at hospitals with 500 births or less, and those with 1,001–2,000 births. In contrast, the proportion increased at hospitals with 501–1,000 births and those with over 2,000 births annually.
- In 2013, private hospitals had a lower proportion of women having their first baby and giving birth vaginally with instruments who had an episiotomy (63.0%) than public hospitals (72.8%). Since 2004, the proportion in public hospitals has increased by 13 percentage points from 59.7% to 72.8% in 2013, whereas there has been little change (less than 1 percentage point) in this proportion in private hospitals since 2004.

### Clinical commentary

Clinical commentary is the same as for the previous measure: Episiotomy for women having their first baby and giving birth vaginally without use of instruments to assist the birth.



**Notes**

1. Data for Victoria were unavailable for this indicator in 2009.
2. Western Australia proportions for the data item used for this indicator did not include women who had episiotomy extending to third and fourth degree perineal tears for 2013. However, this does not apply for years 2007 to 2012.

Source: AIHW National Perinatal Data Collection.

**Figure 2.8: Episiotomy for women having their first baby and giving birth vaginally with the use of instruments to assist birth, 2004–2013**

## Results

**Nationally**, 27.5% of selected women giving birth for the first time had a caesarean section (Figure 2.9).

**Trend** showed an increase in the proportion of women giving birth for the first time who had a caesarean section, from 25.3% in 2004 to 27.5% in 2013. The increase was seen in most jurisdictions, but not Western Australia or South Australia where the proportion decreased.

**Remoteness** of mother's area of residence was associated with differences in the proportion of women giving birth for the first time who had a caesarean section, ranging from 26.1% in *Inner regional* areas to 28.6% in *Very remote* areas.

**Indigenous mothers** had similar rates of caesarean section for their first birth (27.6%) when compared with non-Indigenous mothers (27.5%). The proportion of Indigenous women giving birth for the first time who had a caesarean section increased from 23.4% in 2004 to 27.6% in 2013.

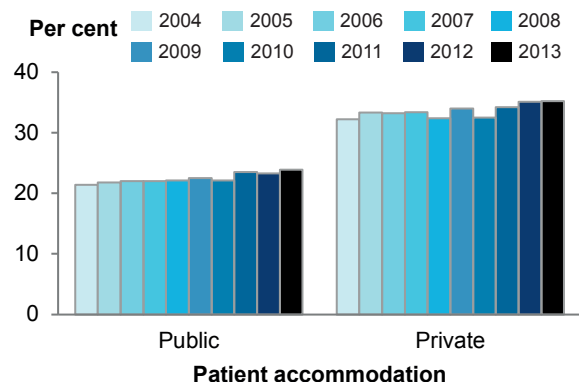
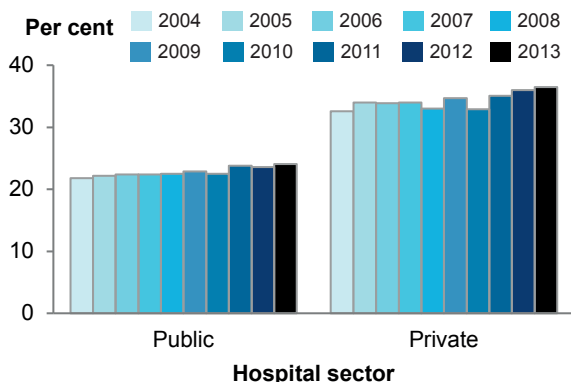
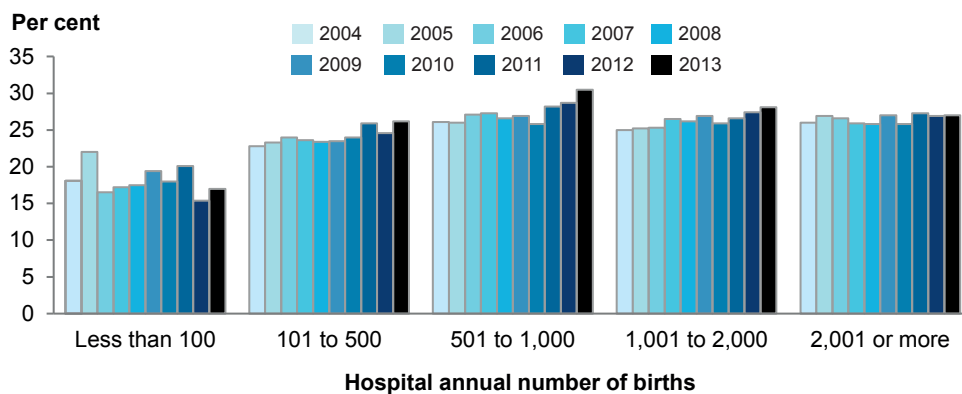
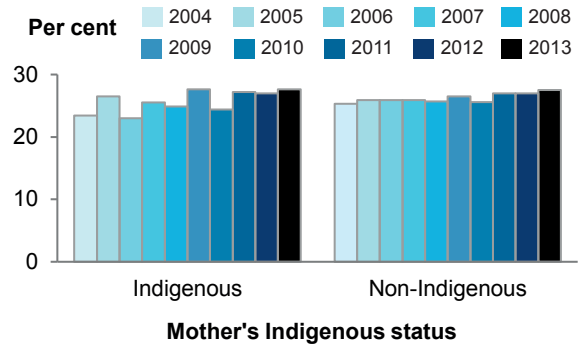
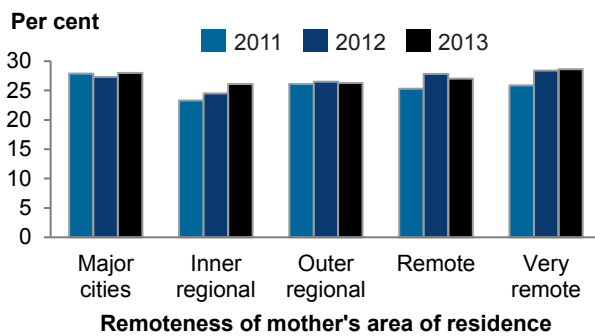
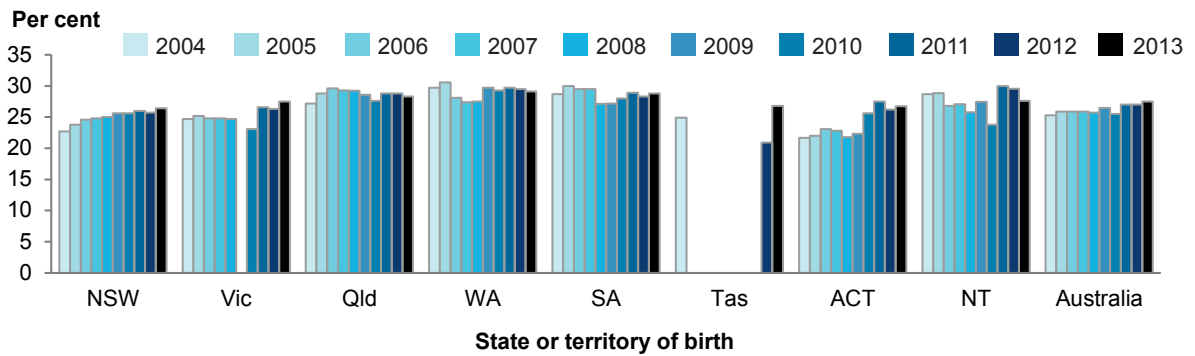
### Hospital characteristics

- The proportion of women who had a caesarean section for their first birth was lower in hospitals with fewer than 100 annual births (17.0%) and between 101 and 500 births (26.2%) than in larger hospitals with more than 500, more than 1,000, or more than 2,000 annual births (30.5%, 28.1% and 27.0%, respectively).
- Women in private hospitals were more likely to have a caesarean section for their first birth (36.5%) than women in public hospitals (24.1%).

**Mothers in private accommodation** were more likely to have a caesarean section for their first birth (35.2%) than mothers in public accommodation (23.9%).

## Clinical commentary

- Caesarean birth is safer now than in the past and serious complications are uncommon, particularly for healthy women. However, a small risk of serious morbidity and mortality for both the mother and the baby remains, and can complicate a subsequent pregnancy. Caesarean section is now one of the most common interventions in pregnancy.
- The choice of larger hospitals, particularly those with tertiary-level facilities in the public sector, for the care of more complex cases and transfers of women who develop complications during antenatal care and in labour is likely to result in an increase in the case complexity and consequently the use of caesarean section in these hospitals.
- Differences in the rates of caesarean birth across the states and territories are not readily explained and may reflect differences in policy, clinical workforce and access to local care.
- The population of women who give birth in the private sector differs from the public sector. Women giving birth in the private sector are older and less disadvantaged. Clinical workforce and policy differences may also affect rates of caesarean section in this selected population.
- The higher rates of caesarean birth in hospitals with 501–1,000 births compared with other hospitals may reflect transfers into tertiary-level care of higher risk cases.
- The World Health Organization recommends that caesarean delivery rates should not exceed 10 to 15% to optimise maternal and neonatal outcomes (WHO 2015). Caesarean delivery rate estimates were reported up to 32.2% within the United States in 2014 (CDC 2014), 17.9% in Canada (Molina et al. 2015; CIHI 2013), and 19% in Japan.



**Notes**

1. Data for Victoria were unavailable for this indicator in 2009 and for Tasmania between 2005 and 2011.
2. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.

Source: AIHW National Perinatal Data Collection.

**Figure 2.9: Caesarean section for selected women giving birth for the first time, 2004–2013**

## Results

**Nationally**, 13.6% of women whose first birth was by caesarean section had their second birth vaginally (Figure 2.10). The proportion ranged from 12.6% in Victoria to 17.6% in the Northern Territory, which had the highest proportion every year since 2009. Data for Western Australia were not available for 2013.

**Trend** has been comparatively stable since 2007, ranging from 13.1% of women whose first birth was by caesarean section having their second birth vaginally in 2007 to 14.0% in 2010, and 13.2% in 2012.

**Remoteness** of the mother's area of residence was associated with differences in the proportion of women whose first birth was by caesarean section who had their second birth vaginally, ranging from 12.6% in *Outer regional* areas to 15.7% in *Very remote* areas.

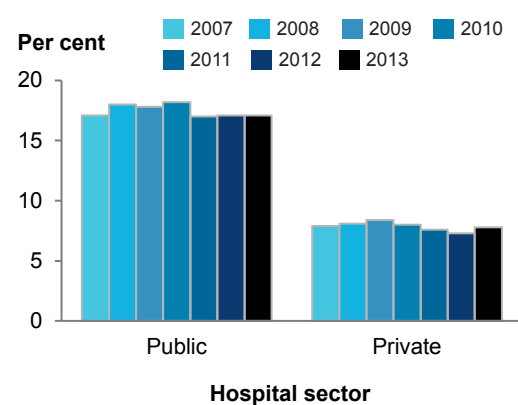
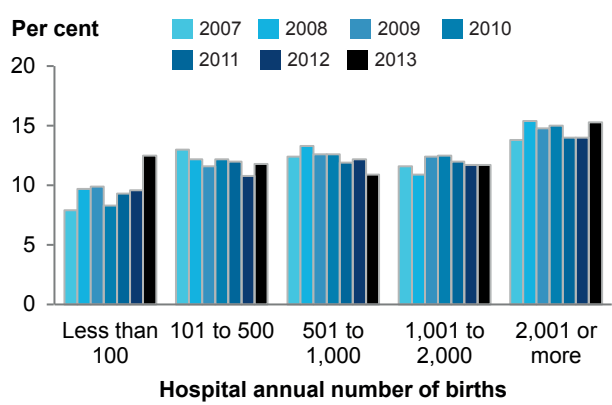
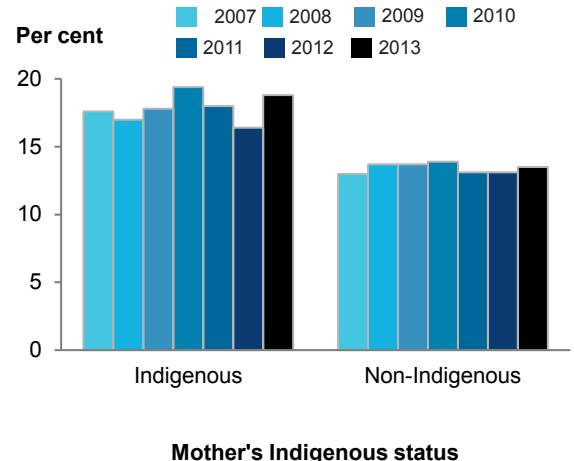
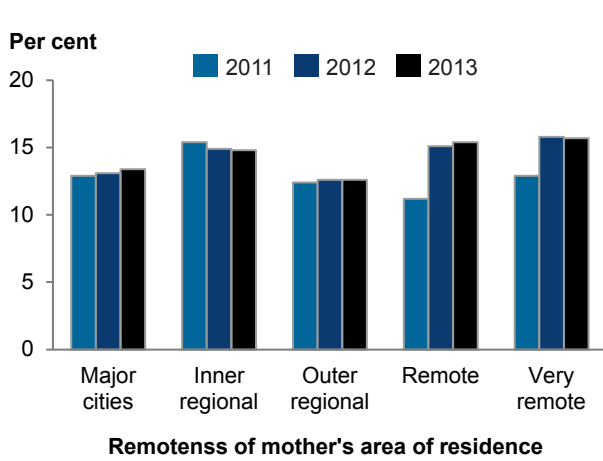
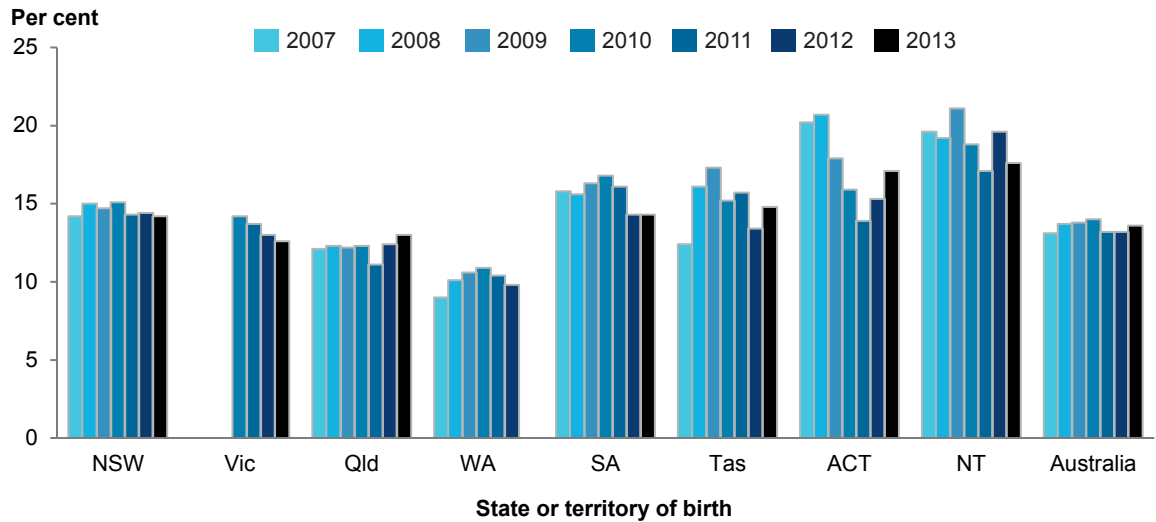
**Indigenous mothers** who had their first birth by caesarean section were more likely to have their second birth vaginally (18.8%) than non-Indigenous women (13.5%).

### Hospital characteristics

- Women whose first birth was by caesarean section were more likely to have their second birth vaginally at hospitals with over 2,000 births annually (15.3%) than at smaller hospitals.
- Women whose first birth was by caesarean section were more likely to have their second birth vaginally at public hospitals (17.1%) than at private hospitals (7.8%).

## Clinical commentary

- The caesarean section rate has increased internationally between 2000 and 2013, with Australia's rate higher than the OECD average over this time (OECD 2015).
- Caesarean birth in a first pregnancy makes a subsequent caesarean likely, and 85% of pregnant women with a history of caesarean birth have a further caesarean birth (AIHW 2015). For some eligible women who have had a previous caesarean, the choice for mode of birth in their next pregnancy is either a trial of vaginal birth after caesarean (VBAC) or an elective repeat caesarean (ERC).
- A systematic review and meta-analysis of the current literature demonstrates maternal mortality increased significantly with ERC compared with planned VBAC (1.34 versus 0.38 per 10,000) (Guise et al. 2010). In contrast, perinatal mortality was significantly increased with planned VBAC (13 per 10,000) compared with ERC (5 per 10,000) (Guise et al. 2010).
- Both ERC and VBAC are associated with benefits and harms. Risks of planned VBAC when compared with planned ERC include haemorrhage, need for blood transfusion, endometritis, uterine rupture, perinatal death, and hypoxic ischaemic encephalopathy (RCOG 2001; Dodd et al. 2004; Guise et al. 2003; Guise et al. 2010; RCOG 2007). Women planning ERC are at increased risk of surgical complications, placenta accreta (a potentially life-threatening obstetric condition where blood vessels and other parts of the placenta grow too deeply into the uterine wall) and risks of multiple caesareans (Guise et al. 2010; Dodd et al. 2007) and their infants are at risk of respiratory morbidity (Guise et al. 2003; Guise et al. 2010).
- About 70% of women who had a caesarean section are good candidates for unassisted delivery, with 70–87% who attempt a vaginal birth succeeding (Frass & Al-Herazi 2012; Potera 2010).



**Notes**

1. Data were not available for Victoria for 2007 to 2009 and Western Australia for 2013.
2. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.
3. Data from Western Australia were only available for six months in 2013, and so have been excluded from this analysis.

Source: AIHW National Perinatal Data Collection.

**Figure 2.10: Women having their second birth vaginally whose first birth was by caesarean section, 2007–2013**

## Results

**Nationally**, 6.4% of women who gave birth by caesarean section received a general anaesthetic (GA) (Figure 2.11). In 2013, the proportion ranged from 4.7% in Western Australia to 8.0% in New South Wales.

**Trend** showed a decrease in the proportion of women who received a GA for a caesarean section, from 8.2% in 2007 to 6.4% in 2013. Over this time, the proportion decreased across every jurisdiction except Western Australia, which already had the lowest proportion.

**Remoteness** of the mother's area of residence was associated with differences in the proportion of mothers who had a caesarean section who received a GA. The proportion ranged from 5.9% in *Major cities* to 8.2% in *Outer regional* areas. Between 2011 and 2013, the proportion decreased across every level of remoteness, however, it was lowest in *Major cities* for all 3 years.

**Indigenous mothers** who gave birth by caesarean section were more likely to have a GA (11.8%) than non-Indigenous mothers (6.2%).

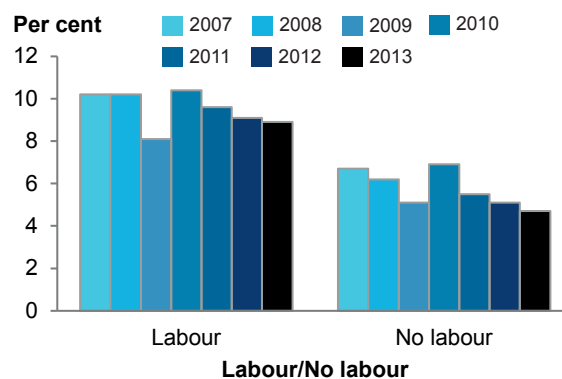
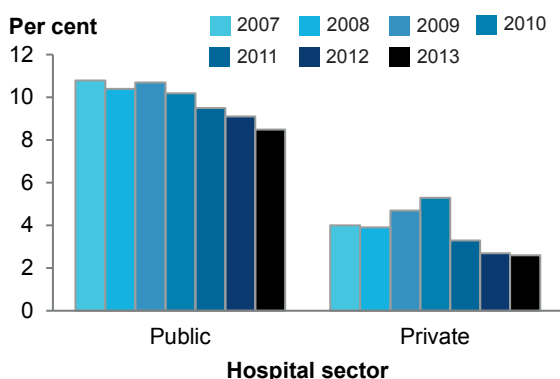
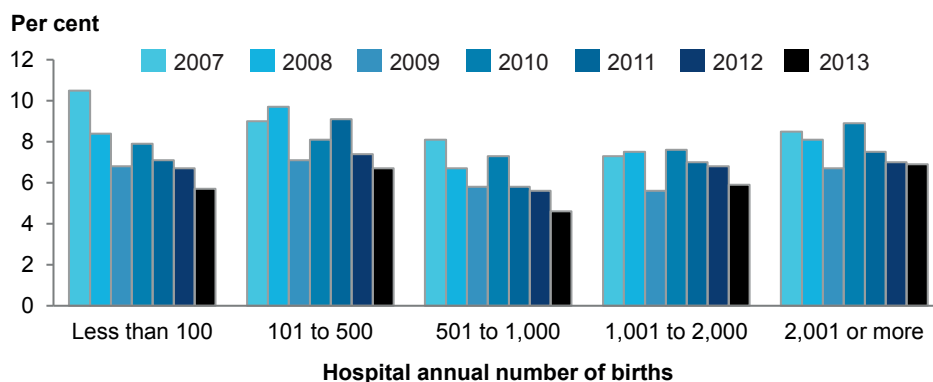
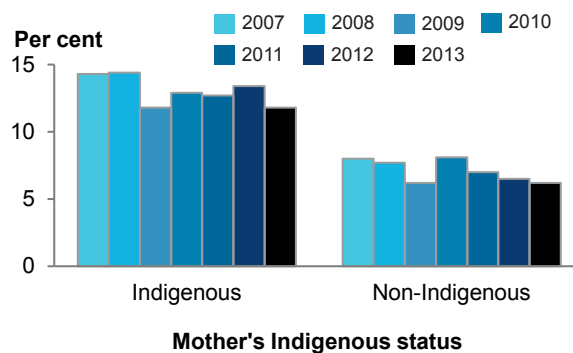
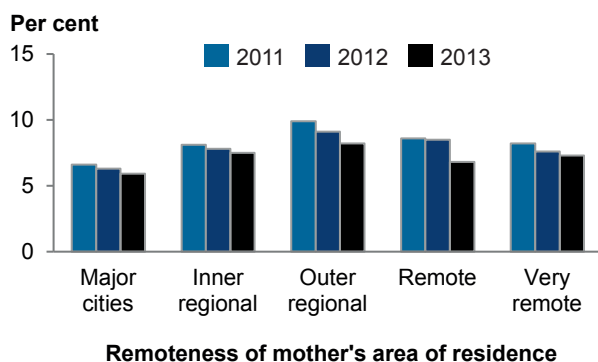
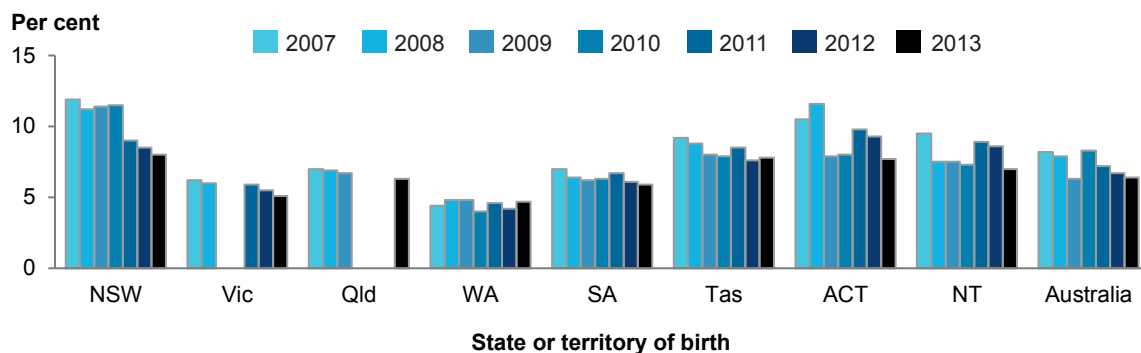
### Hospital characteristics

- The proportion of mothers who gave birth by a caesarean section who had a GA ranged from 4.6% in hospitals with 501–1,000 births annually to 6.9% at hospitals with over 2,000 births.
- The proportion of mothers who gave birth by caesarean section who had a GA was higher in public hospitals (8.5%) than in private hospitals (2.6%).

**Mothers who commenced labour** and gave birth by a caesarean section were more likely to have had a GA (8.9%) than mothers who did not commence labour (4.7%).

## Clinical commentary

- Regional anaesthesia, when compared with general anaesthesia, has a number of well-documented benefits for both the mother and the baby. However, general anaesthesia may still be required, particularly when it is requested by the mother, when there are pre-existing conditions which excluded the administration of regional anaesthesia or when limited time is available, as may occur when the medical condition of the mother or the baby requires immediate birth.
- The higher incidence of general anaesthesia in public versus private hospitals may reflect a lower rate of elective caesarean delivery (with planned regional anaesthesia) as well as less frequent use of regional analgesia for pain relief in labour in the public sector and differing medical and obstetric risk profiles between the sectors.
- Further information about the reasons for lower use of regional analgesia among Indigenous Australian women is needed. If no regional anaesthesia is used, or if regional anaesthesia is unavailable, then general anaesthesia will be more likely if a caesarean section is required.



**Notes**

1. Data were unavailable for this indicator for Victoria between 2009 and 2010, and for Queensland between 2010 and 2012.
2. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.

Source: AIHW National Perinatal Data Collection.

**Figure 2.11: General anaesthetic for women giving birth by caesarean section, 2007–2013**

## Results

**Nationally**, 5.2% of women giving birth for the first time who gave birth vaginally had a third or fourth degree perineal tear (Figure 2.12). The proportion of women giving birth for the first time who had a third or fourth degree perineal tear varied by jurisdiction, ranging from 4.2% in Western Australia to 8.7% in the Australian Capital Territory.

**Trend** data are not available.

**Remoteness** of the mother's area of residence was associated with differences in the proportion of women giving birth for the first time who had a third or fourth degree tear, ranging from 3.7% in *Remote areas* to 5.5% in *Major cities areas*.

**Indigenous mothers** giving birth for the first time were less likely to have a third or fourth degree tear (3.9%) than non-Indigenous mothers (5.3%).

### Hospital characteristics

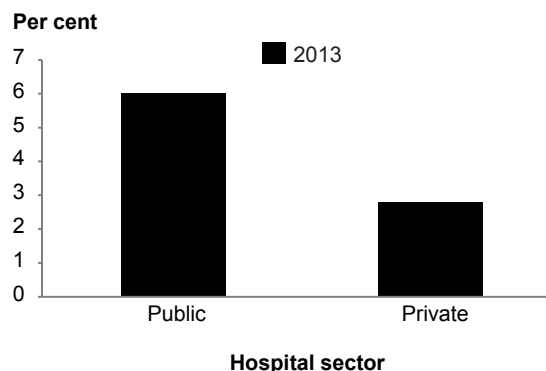
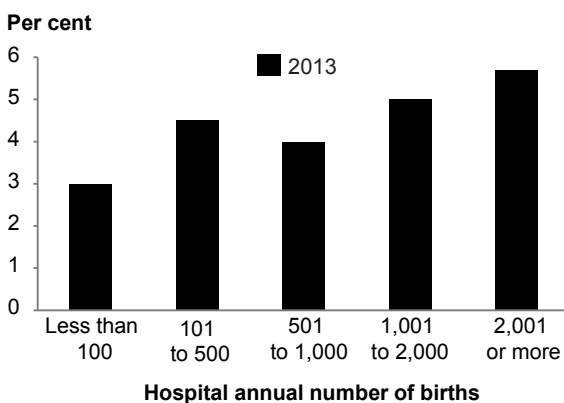
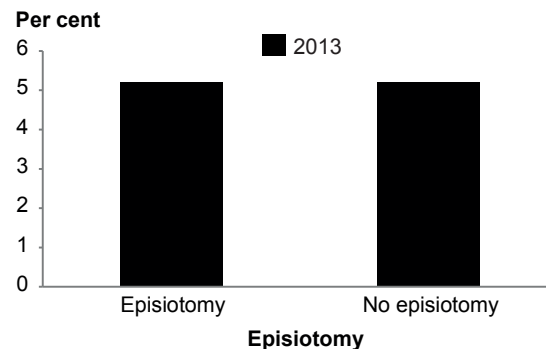
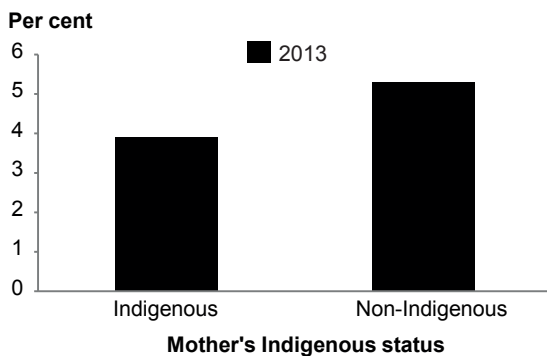
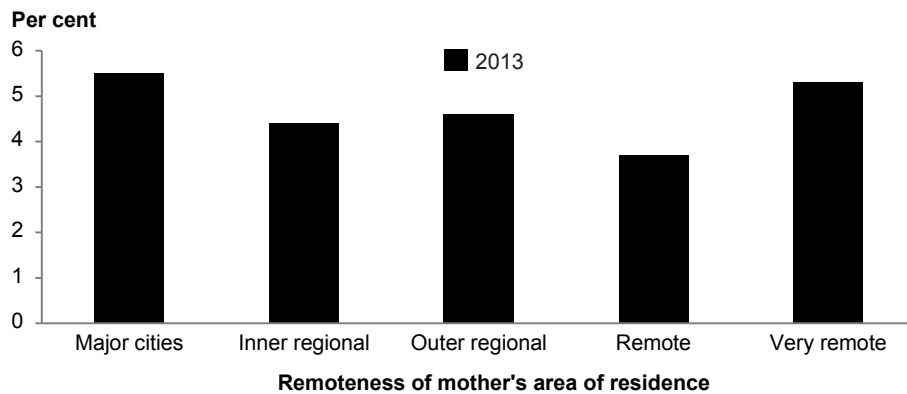
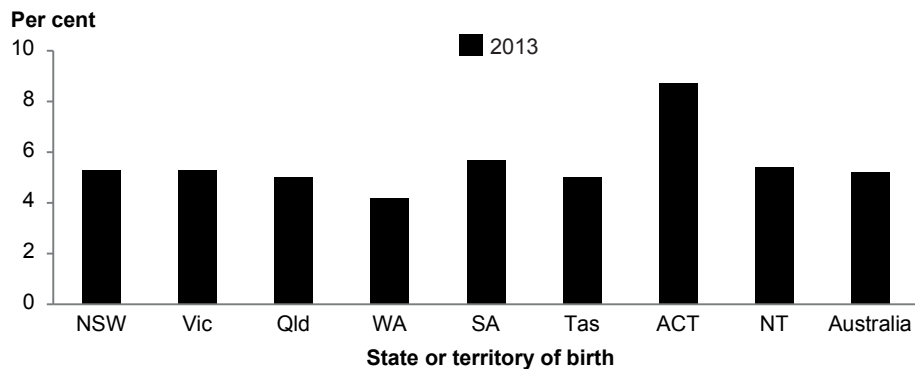
- The proportion of women giving birth for the first time who had a third or fourth degree perineal tear ranged from 3.0% in hospitals with less than 100 births annually to 5.7% at hospitals with 2,000 births or more.
- At private hospitals, 2.8% of women giving birth for the first time had a third or fourth degree tear, compared with 6.0% at public hospitals.

**Mothers with an episiotomy** had a 5.2% chance of having a third or fourth degree perineal tear while giving birth for the first time, which was the same as mothers who did not have an episiotomy.

**Mothers born in India and Vietnam** had rates of third or fourth degree perineal tears of 11.9% and 10.0% compared with Australian-born mothers (4.3%) (Figure 2.13).

## Clinical commentary

- Severe perineal trauma during childbirth is defined as a third-degree tear, which involves injury to the perineum involving the anal sphincter complex; or a fourth-degree tear, which involves injury to the perineum including the external and internal anal sphincter and rectal mucosa (RCOG 2015). Perineal tears are more common in women having their first vaginal birth.
- There is some evidence that the incidence of severe perineal trauma may be increasing in Australia (Ampt & Ford 2015) and internationally (Kettle & Tohill 2008), but it is unclear if this is due to better recognition and reporting or an actual rise.
- Severe perineal trauma is associated with maternal morbidity such as perineal pain, incontinence and difficult or painful sexual intercourse (Scheer et al. 2007; Samarasekera et al. 2008), and rarely, recto-vaginal fistula (Robson & Higgs 2011). The significant psychological effects of severe perineal trauma are under-researched (Priddis et al. 2013).
- Clinical commentary for third and fourth degree perineal tears is continued in the following measure: Third and fourth degree tears for all births.



**Notes**

1. The previous data item used for this indicator was part of the Perinatal NMDS, however 2007–2010 data is not comparable with 2013 data onwards. As a result, a new data item, that is part of the Perinatal Data Set Specifications, has been used for this analysis.
2. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.

Source: AIHW National Perinatal Data Collection.

**Figure 2.12: Third and fourth degree tears for all first births, 2013**



Source: AIHW National Perinatal Data Collection.

**Figure 2.13: Third and fourth degree tears for all first births, 2013, by mother's country of birth**

## Results

**Nationally**, 3.0% of all women who gave birth vaginally had a third or fourth degree perineal tear (Figure 2.14). The proportion of all women who had a third or fourth degree perineal tear ranged from 2.5% in Western Australia to 5.2% in the Australian Capital Territory.

**Trend** data are not available.

**Remoteness** was associated with differences in the proportion of women who had a third or fourth degree tear, ranging from 2.1% in *Remote areas* to 3.2% in *Major cities*.

**Indigenous mothers** were less likely to have a third or fourth degree tear (1.8%) than non-Indigenous mothers (3.0%).

**Mothers with an episiotomy** were more likely (4.6%) to have a third or fourth degree tear than mothers who did not have an episiotomy (2.6%).

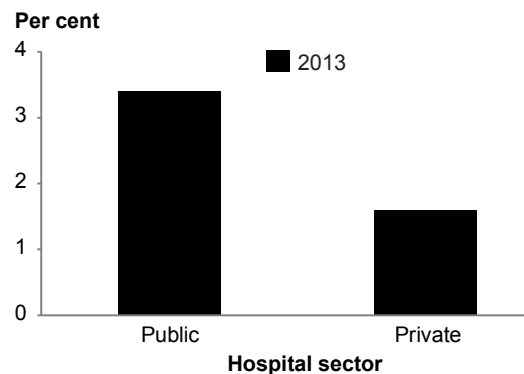
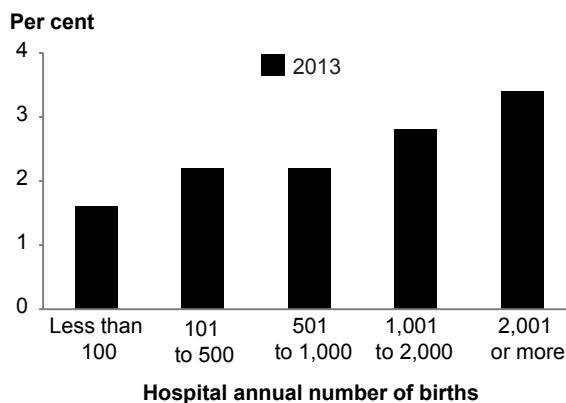
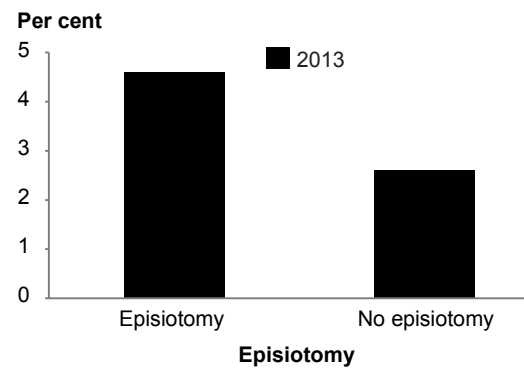
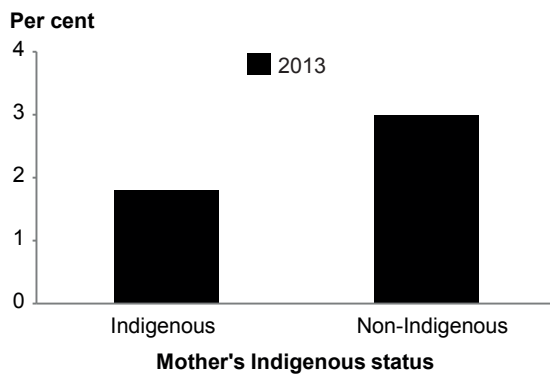
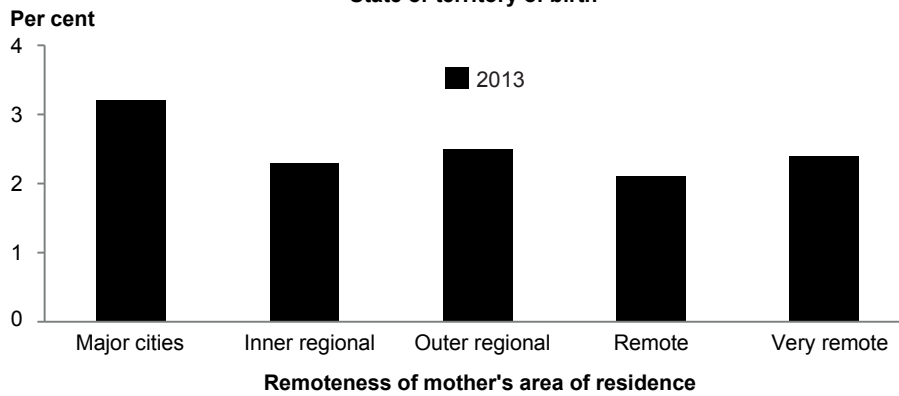
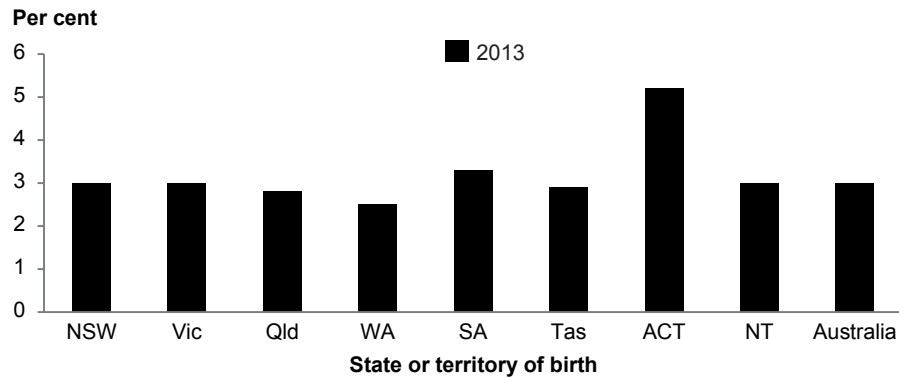
### Hospital characteristics

- The proportion of women who had a third or fourth degree tear was lower at smaller hospitals than larger hospitals, ranging from 1.6% at hospitals with less than 100 births annually to 3.4% at hospitals with more than 2,000 births.
- The proportion of women with a third or fourth degree tear was lower at private hospitals (1.6%) than at public hospitals (3.4%).

**Mothers born in India and Vietnam** had rates of third or fourth degree perineal tears of 8.9% and 5.9% compared with Australian-born mothers (2.4%) (Figure 2.15).

## Clinical commentary

- Clinical commentary for third and fourth degree perineal tears is continued from the previous measure: Third and fourth degree tears for all first vaginal births.
- 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, fetal weight, as well as previous experience of perineal trauma (Ampt & Ford 2015; Dahlen & Homer 2008; Kettle & Tohill 2008; Kudish et al. 2008). Intrapartum risk factors include fetal malpresentation (for example occipito-posterior position), episiotomy (especially midline), assisted (instrumental) birth, prolonged second stage of labour, birth position and shoulder dystocia (Eskandar & Shet 2009; Gottvall et al. 2007; Hartman et al. 2005; Kudish et al. 2008; O'Mahony et al. 2010).

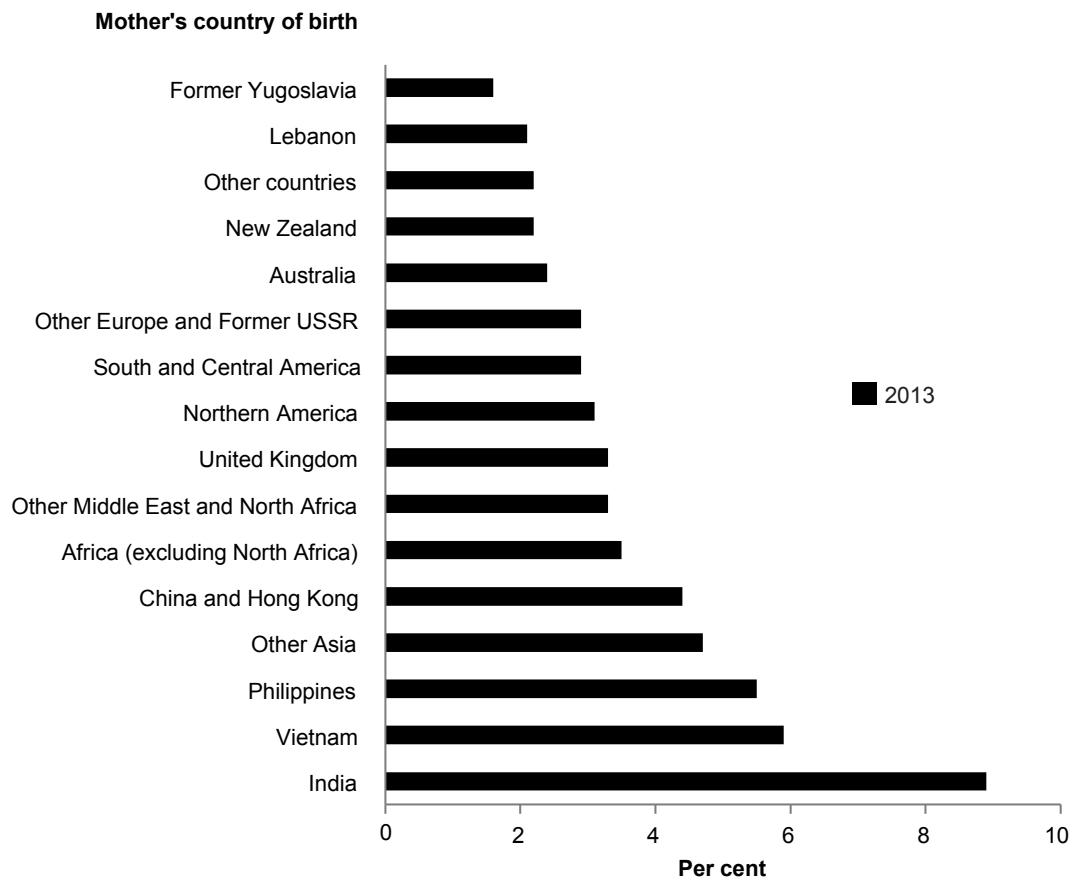


**Notes**

1. The previous data item used for this indicator was part of the Perinatal NMDS, however 2007–2010 data is not comparable with 2013 data onwards. As a result, a new data item, that is part of the Perinatal Data Set Specifications, has been used for this analysis.
2. Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.

Source: AIHW National Perinatal Data Collection.

**Figure 2.14: Third and fourth degree tears for all births, 2013**



Source: AIHW National Perinatal Data Collection.

**Figure 2.15: Third and fourth degree tears for all births, 2013, by mother's country of birth**

## Results

**Nationally**, 1.3% of babies born at or after term had a poor Apgar score (less than 7 at 5 minutes) (Figure 2.16).

**Trend** showed an increase in the proportion of babies born at or after term who had a poor Apgar score, increasing from 0.9% in 2004 to 1.3% in 2013. This general upward trend was seen in all jurisdictions except the Northern Territory. A poor Apgar score is comparatively rare, with the proportion of babies in 2013 with an Apgar score of less than or equal to 2 at 5 minutes equal to 0.08%. A higher proportion of babies born in the Northern Territory had a poor Apgar score than in most other jurisdictions over the last several years.

**Indigenous mothers** (1.6%) had a higher proportion of babies with poor Apgar scores than non-Indigenous mothers (1.3%).

**Babies of mothers who started labour** had a 1.4% chance of having a poor Apgar score, compared with 0.9% of babies born to mothers who had no labour.

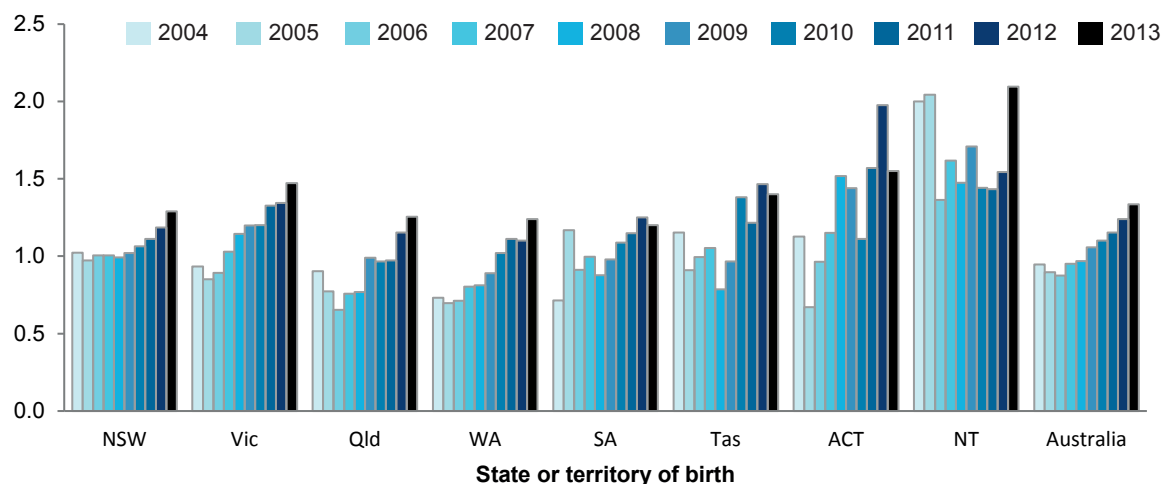
### Hospital characteristics

- The proportion of babies with a poor Apgar score was lower at hospitals with less than 100 births annually (0.9%) than at larger hospitals.
- A higher proportion of babies born in public hospitals had a poor Apgar score (1.6%), compared with babies born in private hospitals (0.7%). The proportion of babies with poor Apgar scores increased over time in public hospitals but was comparatively stable in private hospitals.

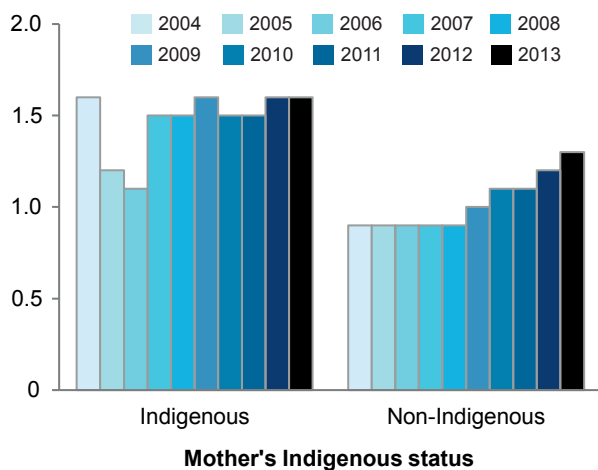
## Clinical commentary

- The Apgar score is a composite measure of the baby's skin colour, spontaneous and reflex activity, pulse rate and respiration at specific times after birth. The Apgar score at 5 minutes after birth indicates how well the baby is adapting to the environment and should be 7 or more if the baby is adapting well.
- Apgar scores at 5 minutes of less than 7 are not specific to any condition and may reflect congenital abnormality, prematurity, perinatal infection, effects of drugs given to the mother for pain relief or anaesthesia, ineffective resuscitation or prolonged hypoxia before birth.
- Higher rates of Apgar scores of less than 7 at 5 minutes may be confounded by other maternal risk factors such as increasing maternal age and obesity.
- Higher rates of Apgar scores of less than 7 at 5 minutes among babies born at or after term in births that follow labour are expected as a result of more varied and overall increased case complexity in this group compared with births with no labour.
- Increased case complexity, higher rates of maternal morbidity, especially diabetes, and maternal smoking during pregnancy, which negatively impacts fetal growth, will contribute to the higher rates of low Apgar scores observed for the babies of Indigenous mothers.
- Case complexity is increased among public hospitals and larger hospitals as a result of transfers into tertiary-level care of higher risk cases. The Australian Capital Territory birth population is disproportionately affected by such transfers of women from surrounding areas in New South Wales.

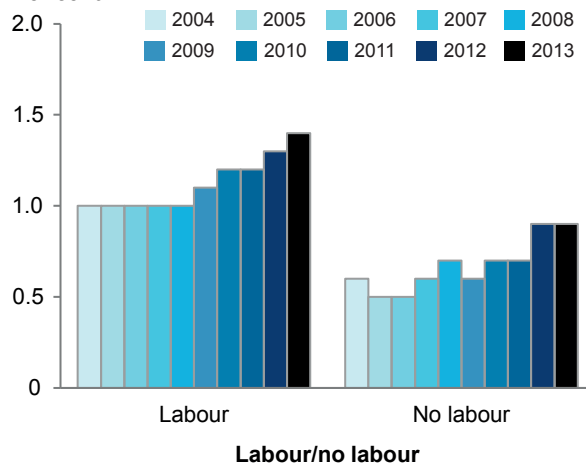
Per cent



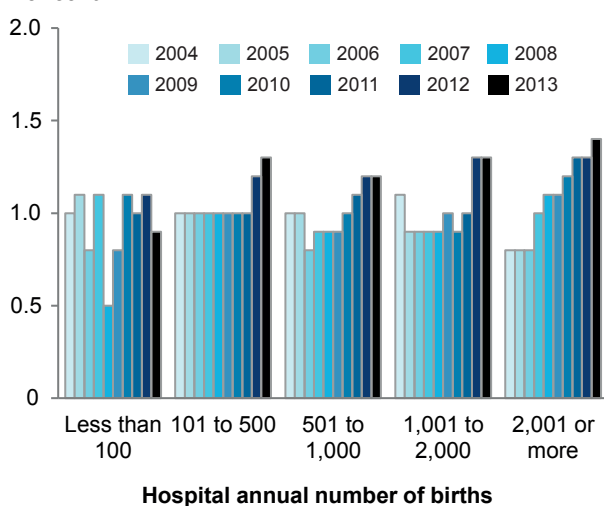
Per cent



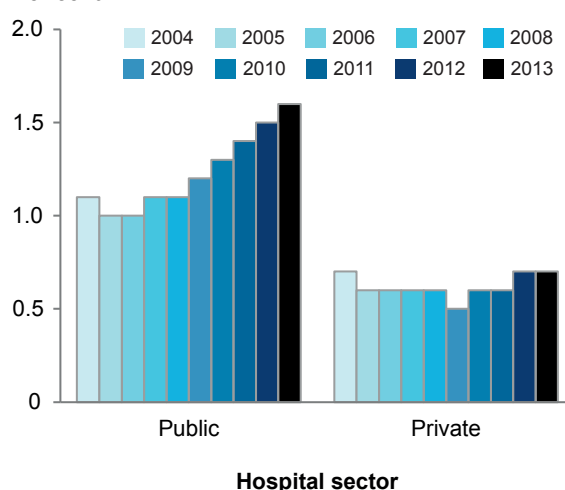
Per cent



Per cent



Per cent



Source: AIHW National Perinatal Data Collection.

**Figure 2.16: Apgar score of less than 7 at 5 minutes for births at or after term, 2004–2013**

## Results

**Nationally**, 1.6% of babies born at or after 40 weeks gestation were small babies (weighing less than 2,750 grams) (Figure 2.17).

**Trend** showed a decrease in the proportion of babies born at or after 40 weeks gestation who were small, from 2.1% in 2004 to 1.6% in 2012 and 2013.

**Remoteness** of mother's areas of residence was associated with differences in the proportion of babies born at or after 40 weeks who were small, ranging from 1.5% in *Inner regional* areas to 2.7% in *Very remote* areas.

**Indigenous mothers** had a higher proportion of babies who were small (3.1%) than non-Indigenous mothers (1.5%). A downward trend is evident in the proportion of small babies born to Indigenous mothers despite the volatility in rates that reflects the small numbers in this population. The decline from 5.7% in 2004 to 3.1% in 2013 compares with a decline from 2.0% in 2004 to 1.5% in 2013 among babies born to non-Indigenous mothers.

### Hospital characteristics

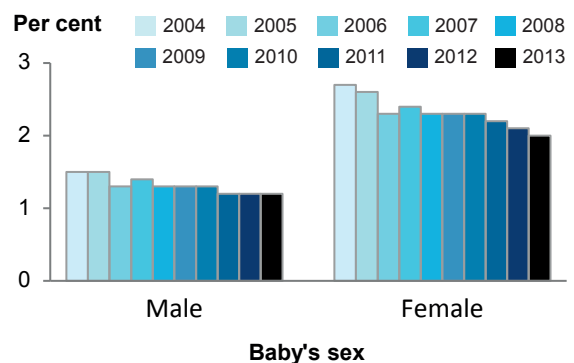
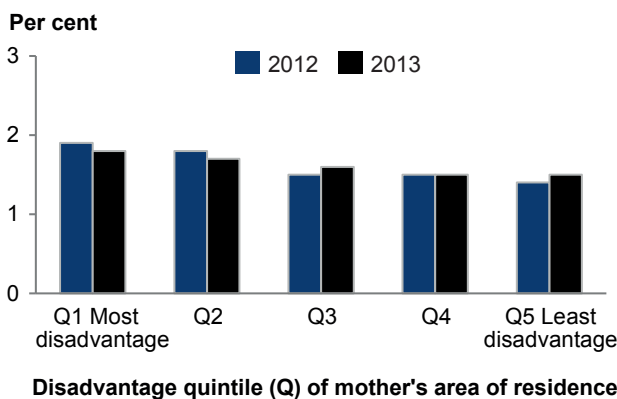
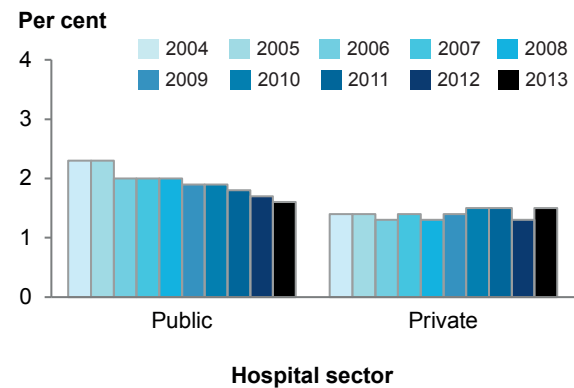
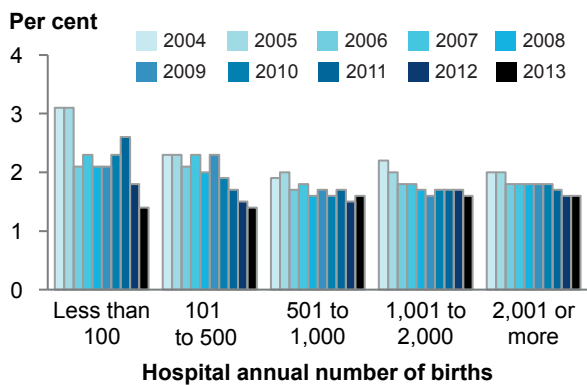
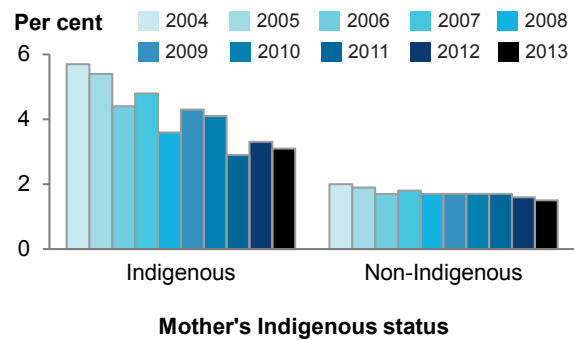
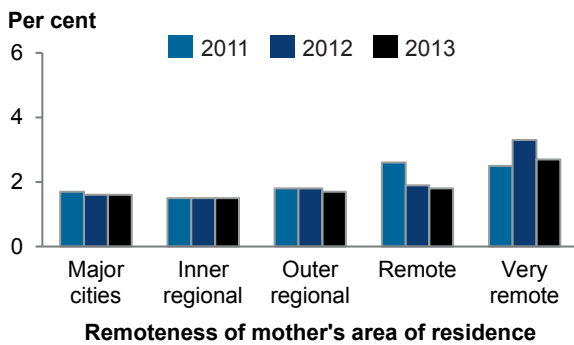
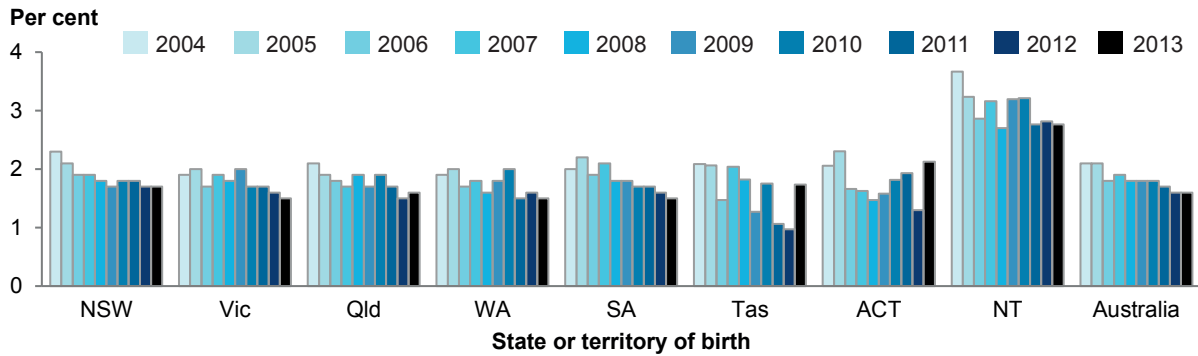
- The proportion of small babies was 1.4% at hospitals with less than 500 births annually and 1.6% at hospitals with more than 500 births annually. The proportion of small babies declined in all hospital groups. The largest decline was in hospitals with fewer than 100 annual births.
- The proportion of small babies was 1.6% at public hospitals and 1.5% at private hospitals.

**Male babies** were less likely to be born small (1.2%) than female babies (2.0%).

Socioeconomic status was associated with small differences in the proportion of babies who were born small, ranging from 1.5% in the least disadvantaged quintile to 1.8% in the most disadvantaged quintile.

## Clinical commentary

- Birthweight 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. Babies born at or after 40 completed weeks of gestational age (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 intrauterine growth restriction (IUGR). 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. A component of antenatal care in late pregnancy is monitoring fetal growth. Labour can be induced when a pregnancy is complicated by established intrauterine growth restriction (IUGR).
- Further investigation is needed to better understand the drivers behind the overall lowering of the annual rates of very small babies born to Indigenous mothers at or after term over this period.
- 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.



Note: Remoteness for 2011 onwards is assigned using the ABS Australian Statistical Geography Standard (ASGS) remoteness structure applied to Statistical Local Area (SLA) of mother's area of usual residence. Data for previous years will not be reported, due to a change in remoteness structure from ABS Australian Standard Geographical Classification (ASGC) to ABS ASGS in 2011.

Source: AIHW National Perinatal Data Collection.

**Figure 2.17: Small babies among births at or after 40 weeks gestation, 2004–2013**



### 3 Development of indicators

In 2009, the EWG proposed a set of 20 NCMI. Currently data for only 10 of these have been published. Expanding the list of NCMI for which data can be reported is important, as it will enable a more complete understanding of maternity care in Australia. For this reason, in 2013 the MSIJC engaged AIHW to:

- develop definitions and criteria and assess the feasibility of existing data to support national reporting for indicators 12–15
- explore the plausibility of developing and reporting on indicators 11, 16, 17 and 18 as part of the framework for improving maternity care.

Progress against these goals through mid-2014 is detailed in the *National core maternity indicators—Stage 2 report: 2007–2011* (AIHW 2014). This report also proposed an additional NCMI (21): Skin-to-skin contact after birth. This chapter presents information on data development work since the publication of the 2014 report. It also contains new specifications for NCMI 13 and 15 and draft specifications for NCMI 18 and 21. The status of all of the NCMI is shown in Table 3.1.

**Table 3.1: NCMI status**

Indicator	Indicator specifications approved by NHIPPC	Status as at June 2016
1. Smoking in pregnancy for all women giving birth	Yes	Published <sup>(a)</sup>
2. Antenatal care in the first trimester for all women giving birth	Yes	Published <sup>(a)</sup>
3. Episiotomy for women having their first baby and giving birth vaginally	Yes	Published <sup>(a)</sup>
4. Apgar score of less than 7 at 5 minutes for births at term	Yes	Published <sup>(a)</sup>
5. Induction of labour for selected women giving birth for the first time	Yes	Published <sup>(a)</sup>
6. Caesarean section for selected women giving birth for the first time	Yes	Published <sup>(a)</sup>
7. Unassisted (non-instrumental) vaginal birth for selected women giving birth for the first time	Yes	Published <sup>(a)</sup>
8. Assisted vaginal birth for selected women giving birth for the first time	Yes	Published <sup>(a)</sup>
9. General anaesthetic for women giving birth by caesarean section	Yes	Published <sup>(a)</sup>
10. Small babies among births at or after 40 weeks gestation	Yes	Published <sup>(a)</sup>
11. High-risk women undergoing caesarean section who receive appropriate pharmacological thromboprophylaxis	No	Not to be reported <sup>(b)</sup>
12. Babies born $\geq 37$ completed weeks gestation admitted to a neonatal intensive care nursery or special care nursery for reasons other than congenital anomaly	No	Further development in 2015–16
13. Third and fourth degree tears for (a) all first births and (b) all births	Yes	Published <sup>(a)</sup>
14. Blood loss of (i) $>1,000$ mL and $<1,500$ mL and (ii) $\geq 1,500$ mL during first 24 hours after the birth of the baby (i.e. primary PPH) for (a) vaginal births and (b) caesarean sections	No	Further development required <sup>(c)</sup>
15. Women having their second birth vaginally whose first birth was by caesarean section	Yes	Published <sup>(a)</sup>
16. Separation of baby from the mother after birth for additional care	No	Not to be reported <sup>(d)</sup>
17. One-to-one care in labour	No	Not to be reported <sup>(d)</sup>
18. Caesarean sections at less than 39 completed weeks gestation (273 days) without obstetric/medical indication	No	First reporting in 2018–19
19. Supporting breastfeeding	No	Referred for further work elsewhere <sup>(e)</sup>
20. Models of care	No	Referred for further work elsewhere <sup>(f)</sup>
21. Skin-to-skin contact after birth	No	Further development in 2015–16

(a) Indicator published in this report and online at the NCMI data portal at <http://www.aihw.gov.au/ncmi/>.

(b) The AIHW ECG recommended in 2013 that further development of NCMI 11 not be progressed. All jurisdictions agreed with this recommendation. This related to significant data quality issues.

(c) The data item underlying this indicator began to be reported voluntarily in 2014. National data is anticipated by 2018–19, prior to which indicator specifications will be sent to NHISSC for approval.

(d) MSIJC recommended that further development of this indicator not be progressed for NCMI 16 and 17.

(e) Work on this indicator was referred to the Child Health and Wellbeing Subcommittee.

(f) Work on this indicator will be covered by the National Maternity Data Development Project.

### 3.1 Specifications approved by NHIPPC and published: NCMI 13 and 15

In late 2015, the National Health Information Standards and Statistics Committee (NHISSC) recommended the approval of specifications for 2 new indicators: NCMI 13: *Third and fourth degree tears for (a) all vaginal first births and (b) all vaginal births* and NCMI 15: *Women having their second birth vaginally whose first birth was by caesarean section* (tables 3.2 and 3.3). Following endorsement by the NHIPPC, they were added to the existing set of 10 NCMI for reporting using the NPDC and have been included in this report. The specifications for these indicators are presented here, and can also be found on METeOR as indicated in Appendix B.

**Table 3.2: Indicator 13**

<b>13. Third and fourth degree tears for (a) all vaginal first births and (b) all vaginal births</b>	
<b>Indicator details</b>	
Description	The proportion of women who have a third or fourth degree perineal laceration after giving birth vaginally for (a) all first births and (b) all births.
Purpose	Third and fourth degree perineal lacerations cause significant ongoing maternal morbidity. This is an outcome indicator that measures their occurrence.
Numerator	(a) The number of women who had a third or fourth degree perineal laceration after giving birth for the first time and who had a vaginal birth.  (b) The number of women who had a third or fourth degree perineal laceration after giving birth vaginally.
Denominator	(a) The number of women who gave birth for the first time and who had a vaginal birth.  (b) The number of women who gave birth vaginally.
Computation/Presentation	Numerator/denominator x 100
Presentation	Percentage
Notes and exceptions	<p>A birth is defined as the event in which a baby comes out of the uterus after a pregnancy of at least 20 weeks gestation or weighing 400 grams or more.</p> <p>Births included are vaginal births, including non-instrumental and instrumental births. A non-instrumental vaginal birth is one in which the baby is born through the vagina without the assistance of instruments. An instrumental birth is a procedure that uses instruments (forceps or vacuum extraction) to assist the baby to come out through the vagina.</p> <p>Births excluded are caesarean sections.</p> <p>Postpartum perineal status is defined as:</p> <p>1st degree laceration/vaginal graze (Code 2)—Graze, laceration, rupture or tear of the perineal skin during delivery that may be considered to be slight or that involves one or more of the following structures: fourchette, labia, periurethral tissue (excluding involvement of urethra), vagina, low vulva.</p> <p>2nd degree laceration (Code 3)—Perineal laceration, rupture or tear as in Code 2 occurring during delivery, also involving: pelvic floor, perineal muscles, vaginal muscles.</p> <p>Excludes laceration involving the anal sphincter.</p> <p>3rd degree laceration (Code 4)—Perineal laceration, rupture or tear as in Code 3 occurring during delivery, also involving: anal sphincter (excluding involvement of anal or rectal mucosa), rectovaginal septum, sphincter not otherwise specified (NOS).</p> <p>Excludes laceration involving the anal or rectal mucosa.</p> <p>4th degree laceration (Code 7)—Perineal laceration, rupture or tear as in Code 4 occurring during delivery, also involving: anal mucosa, rectal mucosa.</p>

**Table 3.2 (continued): Indicator 13**

<b>Data collection details</b>	
Data source	National Perinatal Data Collection
Data source type	Perinatal NMDS
Data item—indicator	Parity Method of birth Postpartum perineal status
Data items—disaggregation factors	Year of birth State or territory of birth Hospital annual number of births Hospital sector Remoteness category (from mother's area of usual residence) Indigenous status of mother With and without episiotomy Mother's country of birth
Frequency of data source collection(s)	Annual
<b>Additional details</b>	
Comments	

**Table 3.3: Indicator 15**

<b>15. Women having their second birth vaginally whose first birth was by caesarean section</b>	
<b>Indicator details</b>	
Description	The proportion of women having their second birth vaginally whose first birth was by caesarean section.
Purpose	The indicator is used to benchmark practice for vaginal birth following caesarean section.
Numerator	The number of women having their second birth vaginally whose first birth was by caesarean section.
Denominator	The number of women having their second birth whose first birth was by caesarean section.
Computation/Presentation	Numerator/denominator x 100
Presentation	Percentage
Notes and exceptions	<p>A birth is defined as the event in which a baby comes out of the uterus after a pregnancy of at least 20 weeks gestation or weighing 400 grams or more.</p> <p>Women included are those who are having a singleton for their second birth and whose first birth was by caesarean section.</p> <p>Women excluded are those whose second birth is a multiple birth, those who are not having their second birth, and those who are having their second birth and whose first birth was a vaginal delivery.</p>
<b>Data collection details</b>	
Data source	National Perinatal Data Collection
Data source type	Perinatal NMDS
Data item—indicator	Parity Method of birth Caesarean section at most recent previous birth
Data items—disaggregation factors	Year of birth State or territory of birth Hospital annual number of births Hospital sector Remoteness category (from mother's area of usual residence) Indigenous status of mother
Frequency of data source collection(s)	Annual
<b>Additional details</b>	
Comments	

## 3.2 Specifications developed but pending endorsement by NHPPC: NCMI 18 and 21

Specifications have been developed for NCMI 18: Caesarean section <39 weeks (273 days) without obstetric/medical indication and NCMI 21: Skin-to-skin contact between mother and baby after birth (tables 3.4 and 3.5). These specifications received support from the ECG. The specifications will next be referred to the National Perinatal Data Development Committee. They have not yet been tabled for NHSSC assessment and NHPPC endorsement.

### 3.2.1 Indicator 18: *Caesarean section <39 weeks (273 days) without obstetric/medical indication*

This indicator examines caesarean sections before 39 weeks that occur without medical/obstetric indication. At the time the *National core maternity indicators—Stage 2 report: 2007–2011* was published, there was a lack of consensus on what indications for caesarean section constituted ‘without medical/obstetric indication’.

ECG members discussed the list of reasons for caesarean sections where there was no labour that should be included in the scope of NCMI 18. They agreed that 3 codes be used in addition to 30 *Maternal choice in the absence of any obstetric, medical, surgical, psychological indications* for caesarean sections ‘without medical/obstetric indication’ where this occurred in the absence of labour and at less than 39 completed weeks. The 3 codes are: 21 *Previous caesarean section*, 22 *Previous severe perineal trauma* and 23 *Previous shoulder dystocia*.

The data element *Birth event—main indication for caesarean section, code N[N]* has been included into Perinatal Data Set Specifications (DSS) in 2015–16. This will permit NCMI 18 to be reported in 2018.

The following technical specifications for NCMI 18 have been approved by the ECG members following consultations.

**Table 3.4: Indicator 18**

<b>18. Caesarean section &lt;39 weeks (273 days) without obstetric/medical indication</b>	
<b>Indicator details</b>	
Description	The proportion of women who gave birth by caesarean section at less than 39 completed weeks (273 days) gestation without adequate obstetric/medical indication.
Purpose	Neonatal respiratory morbidity can be reduced by minimising early delivery. This indicator is used to benchmark practice.
Numerator	The number of women who gave birth by caesarean section at less than 39 completed weeks (273 days) gestation without adequate obstetric/medical indication and where there was no labour.
Denominator	The number of women who gave birth by caesarean section at less than 39 completed weeks (273 days) gestation and where there was no labour.
Computation/Presentation	Numerator/denominator x 100
Presentation	Percentage
Notes and exceptions	<p>A birth is defined as the event in which a baby comes out of the uterus after a pregnancy of least 20 weeks gestation or weighing 400 grams or more.</p> <p>Births included are caesarean deliveries (where there was no labour) at &lt;39 completed weeks (273 days).</p> <p>'Without adequate obstetric/medical indication' includes the following reasons for caesarean section:</p> <ul style="list-style-type: none"> <li>• previous caesarean section</li> <li>• previous severe perineal trauma</li> <li>• previous shoulder dystocia</li> <li>• maternal choice in the absence of any obstetric, medical, surgical, psychological indications.</li> </ul> <p>Births excluded are:</p> <ul style="list-style-type: none"> <li>• caesarean deliveries at or after 39 completed weeks (273 days) gestation</li> <li>• where there was labour</li> <li>• all vaginal deliveries</li> <li>• those delivered pre-term by caesarean section (where there was no labour) with obstetric/medical indication (all reasons for caesarean section other than those listed previously).</li> </ul>
<b>Data collection details</b>	
Data source	National Perinatal Data Collection
Data source type	Perinatal NMDS and Perinatal DSS 2014–15 and 15–16 (for main indication for caesarean section data item)
Data item—indicator	Gestational age Method of birth Onset of labour Main indication for caesarean section
Data items—disaggregation factors	Year of birth State or territory of birth Hospital annual number of births Hospital sector Remoteness category (from mother's area of usual residence) Disadvantage quintile (from mother's area of usual residence) Indigenous status of mother Patient-elected accommodation status
Frequency of data source collection(s)	Annual
<b>Additional details</b>	
Comments	

### 3.2.2 Indicator 21: Skin-to-skin contact between mother and baby after birth

At the time the *National core maternity indicators—Stage 2 report: 2007–2011* was published, it was recommended that this indicator be further developed using the WHO/UNICEF Baby-Friendly Hospital Initiative (BFHI) definition. It was also noted that currently only 1 jurisdiction currently collects data on skin-to-skin contact.

ECG members discussed the BFHI definition of skin-to-skin contact, which is immediately after birth (measured as within 5 minutes) and continuing uninterrupted for at least 1 hour until breastfeeding is initiated. Other measures of skin-to-skin contact (key measure for *Maternity—towards normal birth in NSW* and NHS data item *Skin-to-skin contact within 1 hour of birth*) record whether the contact occurred within 1 hour of birth and members discussed what an appropriate measure for NCMI 21 would be. Members agreed that the duration of skin-to-skin contact was the important aspect to measure for NCMI 21, rather than how quickly the contact was initiated.

Members requested that additional guidance be included in NCMI 21 regarding a definition of ‘uninterrupted’ and how measures can be taken for the baby while still in skin-to-skin contact, based on the BFHI. This is now included in the draft specifications.

As data are collected by only 1 jurisdiction at present, it is not clear when or if data collection and reporting will become possible for this indicator. Further work is required to develop a new data item with jurisdictions to collect data for this indicator measure.

The following technical specifications for NCMI 21 have been approved by the ECG members following consultations.

**Table 3.5: Indicator 21**

<b>21. Skin-to-skin contact between mother and baby after birth</b>	
<b>Indicator details</b>	
Description	The proportion of babies placed in skin-to-skin contact with the mother for at least 1 hour after birth.
Purpose	Placing the baby in skin-to-skin contact with the mother after birth promotes mother–baby attachment and breastfeeding. This indicator is used to benchmark practice.
Numerator	The number of babies placed in skin-to-skin contact with the mother for at least 1 hour after birth.
Denominator	The number of live babies born.
Computation/Presentation	Numerator/denominator x 100
Presentation	Percentage
Notes and exceptions	<p>A birth is defined as the event in which a baby comes out of the uterus after a pregnancy of at least 20 weeks gestation or weighing 400 grams or more. If the baby is alive, the birth is a live birth. If the baby is not alive, the birth is a stillbirth.</p> <p>For stable babies, it is advisable that skin-to-skin contact between mother and baby occurs within 5 minutes following the birth event. After a caesarean birth, skin-to-skin contact should be initiated in theatre. If this is not possible for medical reasons, skin-to-skin contact should be initiated within 10 minutes of arriving in recovery, unless medically contraindicated. In the case of general anaesthesia, skin-to-skin contact should be initiated within 10 minutes of the mother being able to respond to her baby.</p> <p>For babies who are not stable immediately after birth, skin-to-skin contact for at least 1 hour should occur once they are stable.</p> <p>Most examinations can be done while the baby remains in skin-to-skin contact with the mother. Weighing and bathing can be delayed until after skin-to-skin contact has occurred.</p> <p>Skin-to-skin contact should be uninterrupted without separation of mother and baby for at least 1 hour, unless there are medically justifiable reasons.</p> <p>Births excluded are stillbirths.</p>
<b>Data collection details</b>	
Data source	National Perinatal Data Collection
Data source type	Perinatal NMDS and voluntarily-supplied items
Data item—indicator	Birth status.
	Data item to be developed.
Data items—disaggregation factors	Year of birth
	State or territory of birth
	Hospital annual number of births
	Hospital sector
	Remoteness category (from mother’s area of usual residence)
	Disadvantage quintile (from mother’s area of usual residence)
	Indigenous status of mother
Frequency of data source collection(s)	Annual
<b>Additional details</b>	
Comments	Source of definition: Baby-Friendly Hospital Initiative (BFHI) (WHO/UNICEF 2009)

### 3.3 Specifications undergoing further refinement: NCMI 12

Draft specifications for NCMI 12: *Babies born >37 completed weeks gestation admitted to a neonatal intensive care nursery or special care nursery for reasons other than congenital anomaly* have not yet been supported by the ECG.

At the time the *National core maternity indicators—Stage 2 report: 2007–2011* was published, the ECG agreed that the purpose of the indicator was to provide a measure of intrapartum morbidity. It was noted that the Australian Council on Healthcare Standards (ACHS) already had an indicator for ‘All admissions of a term baby to special care nursery (SCN) or neonatal intensive care nursery (NICN)’. A technical specification that incorporated this indicator was developed. This was used to compare the frequency of reasons for admission in the NHMD and the NPDC. There were inconsistencies between the two, and further investigation revealed problems with data quality. Neither data collection was assessed as being of sufficient quality to permit reporting of this indicator. The report recommended that cross checks continue to be performed between the NHMD and the NPDC data to monitor consistency between the 2 collections.

Since that report, the ECG discussed this indicator at 2 meetings. Members agreed that data collected using the ACHS indicator definition was difficult to interpret and did not provide meaningful information on intrapartum morbidity. Therefore, ECG members did not support using the ACHS indicator definition for NCMI 12 and recommended that more granular information on reason for admission to an SCN or NICN be used for NCMI 12.

At the suggestion of the ECG, the AIHW conducted analysis comparing the top 20 ICD-10-AM codes in the Queensland Perinatal Data Collection (2014) and NHMD (2013–14) for term babies admitted to SCN or NICN in Queensland. Similar analysis was undertaken for Victoria using the 2013 Victorian Perinatal Data Collection and the 2012–13 NHMD. Members noted the substantial difference between the state perinatal collections and the NHMD, and suggested that this might be due to inconsistencies in coding.

Members explored grouping reasons for admission to NICN/SCN, for example into respiratory distress and infectious agents. It was suggested that the Neonatal Intensive Care Units’ (NICUS) Data Collection module in NSW captures reasons for admission using tabs and drop down lists. These groupings include immature lung, pneumonia, transient tachypnoea, etc. There is a high level of consistency in the way clinicians code using the NICUS; however, the clinical coders do not have access to the NICUS modules. The ECG is attempting to determine whether the group can access the top 20 reasons for admission based on the NICUS module data. This would help to narrow down the potential list of reasons for admissions.

ECG members noted that if the purpose of the indicator is to identify and reduce babies’ separation from mothers, it might be feasible to use the ACHS indicator definition. This would be imperfect as it would include separations that were clinically necessary, but still provide some indication of the extent of separations of mothers and babies.

## Appendix A: Data quality

The NPDC includes data collected for the Perinatal NMDS, which uses agreed standards for data collection and regular reviews of compliance across all jurisdictions. Changes to all NMDSs are applied on a financial year basis from 1 July each year. Data collection practices can vary for the additional data, which are provided on a voluntary basis. With the exception of indicators 4 and 10, the indicator values rely to some extent on non-NMDS data items. They may therefore be affected by differences in collection practices. A link to more information about data quality for the National Perinatal Data Collection is available here: <http://meteor.aihw.gov.au/content/index.phtml/itemId/624809>.

Some data quality issues are specific to the NCMI's 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 each indicator is provided in tables A1 and A2. When a jurisdiction is missing, this can affect the national result. The effect is increased by a large population in the jurisdiction and when the jurisdictional result is very different than the national result. It can also affect other disaggregations when data for a jurisdiction are missing. 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 it from supplying data except what was in the NMDS. As already discussed, most of the NCMI's are calculated using data outside of the NMDS, meaning that some NCMI's could not be calculated for Victoria for these years. When Victoria supplied the 2009–2010 data to the NPDC in 2011–2012, respectively, this followed the implementation of the electronic transfer of data (ETOD) system for the VPDC (from manual collection of paper-based forms). Delays to the ETOD meant that Victoria supplied AIHW with 'provisional data'.

The legislation subsequently changed to permit Victoria to provide the NPDC with a broader range of data. In 2015, they resupplied data for 2010. This included updates to previously supplied data for that year with enhanced data quality following completion of the ETOD. They also resupplied data for 2011 using data from the VPDC to the NPDC so that data items about Victorian perinatal deaths are consistent with the corresponding national Baby and Mother data sets. 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 places.

**Table A1: Years for which perinatal data were not available for the 2 newly reported NCMI's, 2007–2013**

Indicator	2007	2008	2009	2010	2011	2012	2013
13 Third and fourth degree tears for (a) all first births and (b) for all births	–	–	–	–	–	–	Nil
15 Women having their second birth vaginally whose first birth was by caesarean section	Nil	Nil	Vic	Nil	Nil	Nil	Nil

**Table A2: Jurisdictions for which perinatal data were not available for the 10 previously reported NCMIs, 2004–2013**

Indicator	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1 (a) Smoking in the first 20 weeks of pregnancy for all women giving birth, and (b) smoking after the first 20 weeks of pregnancy for all women who gave birth and report smoking during pregnancy	–	–	–	–	–	–	Nil	Nil	Nil	Nil
2 Antenatal care in the first trimester for all women giving birth	–	–	–	NSW, SA, NT	NSW, SA, NT	NSW, SA, NT, 6 months of data from Qld	Nil	Nil	Nil	Nil
3 Episiotomy for women having their first baby and giving birth vaginally (a) without instruments and (b) with instruments	–	–	–	–	–	Vic	Nil	Nil	Nil	Nil
4 Apgar score of less than 7 at 5 minutes for births at or after term	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
5 Induction of labour for selected women giving birth for the first time	Tas	Tas	Tas	Tas	Tas	Vic, Tas	Nil	Nil	Nil	Nil
6 Caesarean section for selected women giving birth for the first time	Tas	Tas	Tas	Tas	Tas	Vic, Tas	Tas	Tas	Nil	Nil
7 Unassisted (non-instrumental) vaginal birth for selected women giving birth for the first time	Tas	Tas	Tas	Tas	Tas	Vic, Tas	Nil	Nil	Nil	Nil
8 Assisted (instrumental) vaginal birth for selected women giving birth for the first time	Tas	Tas	Tas	Tas	Tas	Vic, Tas	Nil	Nil	Nil	Nil
9 General anaesthetic for women giving birth by caesarean section	–	–	–	Nil	Nil	Vic	Nil	Nil	Nil	Nil
10 Small babies among births at or after 40 weeks gestation	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

## Appendix B: Links to individual indicators in METeOR

Table B1 shows links to individual indicator specifications on METeOR.

**Table B1: Links to individual indicator specifications on METeOR**

Indicator	Link to specifications on METeOR
Smoking in the first 20 weeks of pregnancy for all women giving birth	METeOR ID613173
Smoking after the first 20 weeks of pregnancy for all women who gave birth and reported smoking during pregnancy	METeOR ID613173
Antenatal care in the first trimester for all women giving birth	METeOR ID613175
Induction of labour for selected women giving birth for the first time	METeOR ID613182
Unassisted (non-instrumental) vaginal birth for selected women giving birth for the first time	METeOR ID613186
Assisted (instrumental) vaginal birth for selected women giving birth for the first time	METeOR ID613188
Episiotomy for women having their first baby and giving birth vaginally without instruments	METeOR ID613177
Episiotomy for women having their first baby and giving birth vaginally with instruments	METeOR ID613177
Caesarean section for selected women giving birth for the first time	METeOR ID613184
Women having their second birth vaginally whose first birth was by caesarean section	METeOR ID613197
General anaesthetic for women giving birth by caesarean section	METeOR ID613190
Third and fourth degree tears for all vaginal first births	METeOR ID613194
Third and fourth degree tears for all vaginal births	METeOR ID613194
Apgar score of less than 7 at 5 minutes for births at or after term	METeOR ID613180
Small babies among births at or after 40 weeks gestation	METeOR ID613192
Third and fourth degree tears for (a) all vaginal first births and (b) all vaginal births	METeOR ID613194
Women having their second birth vaginally whose first birth was by caesarean section	METeOR ID613197

# Glossary

**Antenatal:** The period covering conception up to the time of birth. Synonymous with prenatal.

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

**Birth:** An event in which a baby comes out of the uterus after a pregnancy of at least 20 weeks gestation or weighing 400 grams or more.

**Birthweight:** The first weight of the baby (stillborn or liveborn) obtained after birth (usually measured to the nearest 5 grams and obtained within 1 hour of birth).

**Caesarean section:** An operative procedure to remove the baby through a cut through the woman's abdomen and uterus.

**Congenital:** A condition that is recognised at birth, or that is believed to have been present since birth, including conditions that are inherited or caused by environmental factors.

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

**Episiotomy:** An incision of the perineum and vagina to enlarge the vulvar orifice.

**Fourth degree laceration:** Perineal laceration, rupture or tear as in third degree laceration occurring during delivery also involving anal mucosa or rectal mucosa.

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

**High blood pressure/hypertension:** The definition of high blood pressure (also known as hypertension) can vary, but a well-accepted one is from the World Health Organization: a systolic blood pressure of 140 mmHg or more or a diastolic blood pressure of 90 mmHg or more, or [the person is] receiving medication for high blood pressure.

**Indigenous:** A person of Aboriginal and/or Torres Strait Islander descent who identified as an Aboriginal and/or Torres Strait Islander.

**Induction of labour:** Labour started by artificial means.

**Intrauterine growth restrictions:** A fetus whose estimated weight is below the 10th percentile for its gestational age.

**Labour:** The physiological process by which a vaginal birth occurs that commences at the onset of regular uterine contractions that act to produce progressive cervical dilatation, and is distinct from spurious labour or pre-labour rupture of membranes.

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

**Low birthweight:** Weight of a baby at birth that is less than 2,750 grams.

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

**Non-Indigenous:** People who have indicated that they are not of Aboriginal or Torres Strait Islander descent.

**Perinatal:** Pertaining to, or occurring in, the period shortly before or after birth (usually up to 28 days after).

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

**Pre-term birth:** Birth from 20 weeks and before 37 weeks gestational age.

**Term:** Pregnancy duration between 37 and 41 weeks of gestational age.

**Third degree laceration:** Perineal laceration, rupture or tear as in second degree laceration occurring during delivery also involving anal floor, rectovaginal septum, or sphincter not otherwise specified.

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## Related publications

AIHW (Australian Institute of Health and Welfare) 2013. Foundations for enhanced maternity data collection and reporting in Australia: National maternity data development project Stage 1. PER 60. Canberra: AIHW.

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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.

National Core Maternity Indicators (NCMIs) are designed to assist in improving the quality of maternity services in Australia by establishing baseline data for monitoring and evaluating practice change. This report covers the period from 2004 to 2013, and includes data for the vast majority of women who gave birth in Australia over that period. The 10 measures previously reported have been updated with 2010–2013 perinatal data, while 2 new measures are reported for the first time.