



Chapter 3

Women's health and maternity

At a glance

This chapter examines variation in three women's healthcare interventions and two maternity care items. Analysis by Statistical Area Level 3 (SA3) showed marked rate differences across Australia in hysterectomy, endometrial ablation, cervical loop excision and cervical laser ablation, and third- and fourth-degree perineal tears.

Hysterectomy (surgical removal of the uterus – womb) and endometrial ablation (surgical removal of the inner lining of the uterus) are commonly used to treat heavy menstrual bleeding. The hysterectomy rate in Australia is one of the highest reported in the Organisation for Economic Co-operation and Development (OECD), and there is concern that hysterectomy may be overused to treat benign conditions.¹⁻³

This Atlas observed a seven-fold difference between the lowest and highest rates of hysterectomy and a 21-fold difference in rates of endometrial ablation. The finding extends understanding of variation from the first Atlas⁴, and confirms there is marked variation in use of each procedure across Australia. Higher rates of hysterectomy in some areas could be due, in part, to lower use of less invasive treatments for heavy menstrual bleeding. Although hysterectomy stops menstrual bleeding in all women, it is a major surgical procedure.⁵

Pharmaceutical treatment is recommended as the first-line treatment for heavy menstrual bleeding, and endometrial ablation as the first surgical option, if appropriate and the woman prefers it.⁵⁻⁷ Improving access to these effective treatments may help some women avoid the need for hysterectomy.⁸

This Atlas observed an 18-fold variation in rates of cervical loop excision or cervical laser ablation. Expanding availability of these precancer treatments in outpatient settings and ensuring use consistent with guidelines may reduce this variation.

In selected women aged 20–34 years, the Atlas observed a three-fold variation in caesarean section rates. Australia has a higher rate of caesarean section than the OECD reported average.⁹ Ensuring that young women with uncomplicated pregnancies have information and access to services that support their choices for first birth will help ensure the appropriate use of caesarean section.

In all women giving birth vaginally, the Atlas observed a 12-fold variation in rates of third- and fourth-degree perineal tears. Developing an agreed national standard of care to minimise the risk of perineal trauma in childbirth is a priority.



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Recommendations

Hysterectomy and endometrial ablation

- 3a. The Medicare Benefits Schedule (MBS) Review Taskforce to ensure that MBS item descriptors relating to treatments for heavy menstrual bleeding are aligned with the care described in the Heavy Menstrual Bleeding Clinical Care Standard.
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- 3b. State and territory health departments to ensure that women who have heavy menstrual bleeding have been offered clinically appropriate treatment options, as described in the Heavy Menstrual Bleeding Clinical Care Standard, before they are placed on a waiting list for hysterectomy.
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- 3c. Relevant professional colleges to include intrauterine device insertion within their advanced training programs. They should also review incentives for clinicians to participate in continuing professional development training programs on intrauterine device insertion, and access to such programs, to increase the number of clinicians skilled in insertion of the levonorgestrel intrauterine system.
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Cervical loop excision and cervical laser ablation

- 3d. State and territory health departments to implement outpatient models of care for cervical loop excision and cervical laser ablation to ensure that, if clinically appropriate, patients can be offered treatment in outpatient settings.
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Caesarean section

- 3e. The Commission to work with relevant colleges and specialist societies to develop decision support tools on birth options for pregnant women aged 34 years and under without complications for birth.
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- 3f. Maternity health services to ensure regular clinical review of perinatal data (National Core Maternity Indicators and additional data from perinatal datasets) by a multidisciplinary team that includes neonatologists.
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- 3g. The Australian Institute of Health and Welfare, in collaboration with data providers and other stakeholders, to investigate ways of improving reporting of caesarean section rates according to obstetric and neonatal risk factors, such as use of the Robson classification.
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- 3h. The Commission to refer the Atlas findings to the Community Care and Population Health Principal Committee of the Australian Health Ministers' Advisory Council for consideration in relation to the inclusion of caesarean section <39 weeks (273 days) without obstetric or medical indication as a National Core Maternity Indicator (as described in the AIHW report *National Core Maternity Indicators 2010–2013*, released in 2016).
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Third- and fourth-degree perineal tears

- 3i. Relevant medical and midwifery professional colleges to develop, agree on and disseminate an agreed model of care for the second stage of labour to minimise the risk of severe perineal trauma.
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- 3j. The Commission to work with Women's Healthcare Australasia, and relevant colleges and specialist societies to develop a clinical care standard on perineal care during vaginal birth, to improve national consistency of best practice for the prevention, recognition and management of severe perineal trauma.
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Background

This chapter examines variation in hospitalisations for:

- Hysterectomy
- Endometrial ablation
- Cervical loop excision or cervical laser ablation
- Caesarean section in selected women aged 20–34 years
- Third- and fourth-degree perineal tears.

Hysterectomy and endometrial ablation

Hysterectomy – surgical removal of the uterus – is used to treat a number of benign conditions, as well as gynaecological cancers. There has been concern since the 1970s and 1980s about rising rates of hysterectomy for benign conditions, such as menstrual bleeding disorders, and the considerable variability in rates across Australia¹⁰ and internationally.¹¹ This concern has led to ongoing examination of variation in hysterectomy rates by the OECD, and annual reporting of hysterectomy rates by the Australian Institute of Health and Welfare (AIHW).^{11,12} Although hysterectomy rates have fallen in Australia since the 1980s, Australian rates are markedly higher than those in comparable OECD countries, such as New Zealand and England.¹¹

Since the 1980s, the range of effective treatments for heavy menstrual bleeding has expanded. Endometrial ablation was introduced in the late 1980s. It is a less invasive surgical procedure for treating heavy menstrual bleeding than hysterectomy, and involves the removal of the inner lining of the uterus (endometrium) but not the uterus itself, using various surgical techniques. Published data on endometrial ablation rates in Australia are limited, and the impact of newer methods of endometrial ablation on overall endometrial ablation rates in Australia has not been examined.

Exploring variation in hysterectomy and endometrial ablation rates is a tool for investigating the appropriateness of care for heavy menstrual bleeding. Affecting 1 in 4 women, heavy menstrual bleeding can substantially interfere with a woman's social and physical wellbeing.¹³ Although hysterectomy will be the most appropriate clinical choice for some women, or may be their preference, it is important that all women with heavy menstrual bleeding have the choice of, and are fully informed about, all effective treatments suitable for them. These treatments may help them avoid the need for hysterectomy.⁸

Limited guidance is available in Australia on the management of heavy menstrual bleeding. Guidelines from the United Kingdom and Canada recommend pharmaceutical treatments, such as the levonorgestrel uterine system, as the first-line treatment once large fibroids and malignancies have been ruled out.^{5,7} Endometrial ablation is recommended for heavy menstrual bleeding that is having a severe impact on quality of life for women who no longer wish to conceive.⁵ Hysterectomy is recommended for heavy menstrual bleeding if less invasive options are unsatisfactory, inappropriate or not desired by the woman.^{5,7} Hysterectomy stops menstrual bleeding in all women and also permanently stops fertility. Although an effective treatment, it is associated with the risks of major surgery.⁵

Cervical loop excision and cervical laser ablation in cancer prevention

The current National Cervical Screening Program (NCSP), introduced in 1991, aims to prevent cervical cancer through routine screening of all women aged 20–69 years to detect and remove precancerous cells from the cervix (neck of the womb).¹⁴ Cervical loop excision and cervical laser ablation are the main procedures for removing cervical precancers detected by cervical screening or other examinations. These treatments, along with ongoing monitoring, prevent precancer from developing into cancer.

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Since the current NCSP was introduced, there has been a marked reduction in both the incidence of cervical cancer and mortality from the disease.¹⁴ Most cervical cell abnormalities detected by screening are low-grade abnormalities¹⁴ and do not require treatment.^{15,16} High-grade cervical abnormalities (or cervical precancers) confirmed by a further examination (colposcopy) and testing require treatment to prevent the development of cancer. The effective targeting of treatments to confirmed cervical precancers has no doubt contributed to the success of the NCSP, but there has been limited analysis of treatment rates at a national level.

Exploring variation in precancer treatment rates is a first step towards examining the appropriateness of management and adherence to guideline-recommended care. Appropriate use of these treatments is particularly important for young women who wish to conceive in the future because cervical loop excision and cervical laser ablation are associated with an increased risk of premature births.¹⁷ Although the national system of state-based Pap smear registers records results of cervical screening and provides a reminder function for follow-up of screen-detected abnormalities, it does not currently collect data on treatments received for cervical precancers.

Cervical loop excision and cervical laser ablation are the main treatments for cervical precancer, and can be performed in outpatient settings under a local anaesthetic.^{18,19} The Atlas has been limited to measuring the number of these procedures performed for admitted patients, including women admitted to hospitals or day surgery facilities. Therefore, some variation resulting from uncounted outpatient activity was expected.

A number of initiatives are under way and planned to improve the appropriateness of management for cervical precancers. The Colposcopy Quality Improvement Program (C-QulP), set up in 2009 by the Royal Australian and New Zealand College of Obstetricians and Gynaecologists, aims to improve the care of women who are referred for colposcopy and treatment of screen-detected abnormalities. The C-QulP offers all medical practitioners in Australia and New Zealand who are currently practising colposcopy the opportunity to be certified in this field, and for certification and recertification to be used as part of their college's continual professional development requirements.²⁰

From 1 December 2017, the National Cancer Screening Register will require colposcopists to send colposcopy data to the register. In return, they will receive aggregated reports about the tests and treatments they have administered as part of the NCSP.²¹

Renewed National Cervical Screening Program

The renewed NCSP, to be introduced on 1 December 2017, will offer screening to all women aged 25–74 years every five years using a primary human papillomavirus (HPV) test.²² This change has been made because a review of the evidence showed that an HPV test performed every five years was more effective than the program it will replace, was just as safe, and was estimated to result in a greater than 20% reduction in incidence of, and mortality from, cervical cancer in Australian women.^{23–25} Modelling suggests that there may be an overall increase in colposcopy following introduction of the renewed NCSP. There may also be a small decrease (5%) in treatments for HPV-vaccinated women and a small increase (6%) in treatments for HPV-unvaccinated women.²⁶

Caesarean section in selected women aged 20–34 years

A caesarean section is an operation in which a baby is born through an incision in the mother's abdomen and uterus.²⁷ Caesarean section can be lifesaving, but is associated with small risks of serious adverse effects for the mother and the baby, and for subsequent births.²⁸

Recent attention has focused on the potential effects of early planned caesarean section (<39 weeks) on neonatal respiratory function.^{29,30} This has led to recommendations for planned caesarean section at approximately 39 weeks gestation or later in uncomplicated singleton (one baby) pregnancies.^{28,31,32} Early planned caesarean section has also been associated with increased risk of childhood developmental delay³³ and attention-deficit/hyperactivity disorder (ADHD).³⁴

The rate of caesarean section in Australia has risen steadily since the early 1990s³⁵, a trend seen in nearly all comparable OECD countries.⁹ The increasing age of first-birth mothers is commonly put forward as a reason for this rise³⁶, with older mothers having increased risks of obstetric complications and adverse outcomes.³⁷ However, there are indications that the rate of caesarean section is increasing in younger women (aged 20–34 years)³⁸, and that this may not be due to medical reasons.^{39,40} Younger women are more likely to have a subsequent birth, and data show that, for most, the birth method chosen for the first birth will set the course for the future.⁴¹

These considerations have led to concern about the growing numbers of women at prime age for an uncomplicated vaginal birth (that is, 20–34 years) having their first baby by caesarean section for non-medical reasons.^{39,40} Exploring variation in caesarean section for first births in a subset of these women who, along with their babies, are potentially at low risk from vaginal birth is a logical first step in investigating the appropriate use of the procedure, and supporting women to make informed choices about their maternity care.

Selected women are those aged 20–34 years who gave birth for the first time to a single baby of gestational age at birth between 37 and 41 completed weeks, with vertex presentation (baby's head at the cervix).

Third- and fourth-degree perineal tears

Perineal tears are a common complication of vaginal birth. For most affected women, tears are minor.⁴¹ A small proportion of women experience severe tears, which, for some, can have lifelong consequences.⁴² Prevention, timely detection and appropriate repair of perineal tears are important to minimise the risk of these injuries and their complications, such as infection, blood loss, pain and incontinence.^{42,43}

In Australia and in comparable countries, the rate of third- and fourth-degree perineal tears has increased over the past two decades.^{44–48} The reasons for this rise are not fully understood, but improved recognition and reporting^{38,49}, as well as changes in risk factors and practices, may contribute.^{48,50}

Third- and fourth-degree perineal tears are recognised as a significant complication of maternity care, in Australia and internationally. In Australia, third- and fourth-degree perineal tears for all vaginal births and for all vaginal first births are National Core Maternity Indicators. The purpose of the National Core Maternity Indicators is to monitor safety and quality of maternity care to ensure that there is continual improvement in the quality of maternity services.

Exploring variation in third- and fourth-degree perineal tears is the first step in investigating potential causes, and improving the quality of prevention, detection and treatment of these injuries.

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About the data

For the women's health items (hysterectomy, endometrial ablation, and cervical loop excision or cervical laser ablation), data are sourced from the National Hospital Morbidity Database, and include both public and private hospitals. Rates are based on the number of hospitalisations per 100,000 women.

For the maternity items (caesarean section in selected women aged 20–34 years, and third- and fourth-degree perineal tears), data are sourced from the AIHW National Perinatal Data Collection, and include both public and private hospitals. Rates for each item are based on:

- The number of selected women who had a caesarean section per 1,000 selected women aged 20–34 years; selected women are women aged 20–34 years who met all of these criteria: gave birth for the first time, singleton pregnancy (carried one baby), baby's head positioned at the cervix, and baby of gestational age 37–41 completed weeks at birth
- The number of third- and fourth-degree perineal tears per 1,000 women who gave birth vaginally; data include instrument-assisted births, unassisted (non-instrumental) births and episiotomies.

For all items, the analysis and maps are based on the residential address of the patient and not the location of the hospital. Rates are age standardised to allow comparisons between populations with different age structures. Data quality issues – for example, the recognition of Aboriginal and Torres Strait Islander status in datasets – could influence the variation seen. For some indicators, data are aggregated over three years to provide sufficient numbers to support reporting at the local level.

Factors influencing population-based hospitalisation rates include incidence and prevalence of risk factors and disease, hospital admission practices, bed availability, and patient social factors such as the availability of carers, the availability of other treatment options, treatment compliance and travel distance.

References

1. Spillsbury K, Semmens JB, Hammond I, Bolck A. Persistent high rates of hysterectomy in Western Australia: a population-based study of 83,000 procedures over 23 years. *BJOG* 2006;113(7):804–9.
2. Yusuf F, Leeder S, Wilson A. Recent estimates of the incidence of hysterectomy in New South Wales and trends over the past 30 years. *Aust N Z J Obstet Gynaecol* 2016;56(4):420–5.
3. Australian Commission on Safety and Quality in Health Care, Australian Institute of Health and Welfare. Exploring healthcare variation in Australia: analyses resulting from an OECD study. Sydney: ACSQHC; 2014.
4. Australian Commission on Safety and Quality in Health Care, National Health Performance Authority. Australian atlas of healthcare variation. Sydney: ACSQHC; 2015. Available from: <http://www.safetyandquality.gov.au/atlas>
5. National Collaborating Centre for Women's and Children's Health. Heavy menstrual bleeding. Clinical guideline. London: Royal College of Obstetricians and Gynaecologists; 2007.
6. Marret H, Fauconnier A, Chabbert-Buffet N, Cravello L, Golfier F, Gondry J, et al. Clinical practice guidelines on menorrhagia: management of abnormal uterine bleeding before menopause. *Eur J Obstet Gynecol Reprod Biol* 2010;152(2):133–7.
7. Society of Obstetricians and Gynaecologists of Canada. Abnormal uterine bleeding in pre-menopausal women. *J Obstet Gynaecol Can* 2013;35(5 eSuppl).
8. Kai J, Middleton L, Daniels J, Pattison H, Tryposkiadis K, Gupta J, et al. Usual medical treatments or levonorgestrel-IUS for women with heavy menstrual bleeding: long-term randomised pragmatic trial in primary care. *Br J Gen Pract* 2016;66(653):e861–e870.
9. Organisation for Economic Co-operation and Development. Health at a glance 2015: health care activities. Paris: OECD; 2015. Available from: <http://www.oecd.org/health/health-systems/health-at-a-glance-19991312.htm>
10. Yusuf F, Siedlecky S. Hysterectomy and endometrial ablation in New South Wales, 1981 to 1994–1995. *Aust N Z J Obstet Gynaecol* 1997;37(2):210–16.
11. McPherson K, Gon G, Scott S. International variations in a selected number of surgical procedures. Paris: Organisation for Economic Co-operation and Development; 2013. (OECD Health Working Papers, No. 61.2013.)
12. Australian Institute of Health and Welfare. Admitted patient care 2014–15: Australian hospital statistics. Canberra: AIHW; 2016. (Cat. no. HSE 172; Health Services Series No. 68.) Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129554729>
13. Royal College of Obstetricians and Gynaecologists. National heavy menstrual bleeding audit. London: RCOG; 2014.
14. Australian Institute of Health and Welfare. Cervical screening in Australia 2013–2014. Canberra: AIHW; 2016. (Cat. No. CAN 95; Cancer Series No. 97.) Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129554884>
15. National Health and Medical Research Council. Screening to prevent cervical cancer: guidelines for the management of asymptomatic women with screen detected abnormalities. Canberra: NHMRC; 2005. Available from: https://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/wh39_screening_to_prevent_cervical_cancer_150610.pdf
16. Bentley J, Society of Canadian Colposcopists. Colposcopic management of abnormal cervical cytology and histology. *J Obstet Gynaecol Can* 2012;34(12):1188–206.
17. Kyrgiou M, Athanasiou A, Paraskevaidi M, Mitra A, Kalliala I, Martin-Hirsch P, et al. Adverse obstetric outcomes after local treatment for cervical preinvasive and early invasive disease according to cone depth: systematic review and meta-analysis. *BMJ* 2016;354:i3633.
18. Cancer Council Australia. Understanding cervical cancer: a guide for women with cancer, their families and friends. Sydney: Cancer Council Australia; 2015. Available from: <http://www.cancercouncil.com.au/wp-content/uploads/2014/05/UC-Pub-Cervical-CAN706-NOV-2015.pdf>
19. Cancer Research UK. Cervical cancer: treating if you have abnormal cervical cells. London: Cancer Research UK; 2016 [cited 2016 Nov 10]. Available from: <http://www.cancerresearchuk.org/about-cancer/type/cervical-cancer/smears/treatment-if-you-have-abnormal-cervical-cells>
20. Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Colposcopy Quality Improvement Program (C-QulP). Melbourne: RANZCOG; 2011. Available from: <http://www.cquip.edu.au>
21. Hammond I. Cervical Quality Improvement Program (C-QulP) & the renewed National Cervical Screening Program. Melbourne: Royal Australian and New Zealand College of Obstetricians and Gynaecologists; 2017 [cited 2017 Mar 15]. Available from: [https://www.ranzcog.edu.au/news/Cervical-Quality-Improvement-Program-\(C-QulP\)-and](https://www.ranzcog.edu.au/news/Cervical-Quality-Improvement-Program-(C-QulP)-and)
22. National Cervical Screening Program. Future changes to cervical screening. Canberra: NCSP; 2017 [cited 2017 Mar 15]. Available from: <http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/future-changes-cervical>
23. Lew JB, Simms K, Smith M, Kang YK, Xu X, Caruana M, et al. National Cervical Screening Program renewal: effectiveness modelling and economic evaluation in the Australian setting. Canberra: MSAC; 2013. (Application No. 1276; assessment report.) Available from: [http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/E6A211A6FFC29E2CCA257CED007FB678/\\$File/Renewal%20Economic%20Evaluation.pdf](http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/E6A211A6FFC29E2CCA257CED007FB678/$File/Renewal%20Economic%20Evaluation.pdf)
24. Medical Services Advisory Committee. National Cervical Screening Program renewal: executive summary – report. Canberra: MSAC; 2014. (Application No. 1276; assessment report.) Available from: [http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/E6A211A6FFC29E2CCA257CED007FB678/\\$File/Executive%20Summary%20notated%202013.6.14.pdf](http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/E6A211A6FFC29E2CCA257CED007FB678/$File/Executive%20Summary%20notated%202013.6.14.pdf)
25. Medical Services Advisory Committee. MSAC outcomes: Application No. 1276 – renewal of the National Cervical Screening Program, MSAC 61st meeting, 3–4 April 2014, public summary document. Canberra: Australian Government; 2014. Available from: [http://www.msac.gov.au/internet/msac/publishing.nsf/Content/D924E2F768B13C4BCA25801000123B9E/\\$File/1276%20-%20Final%20MSAC%20PSD%20-%20NCSP%20Renewal.pdf](http://www.msac.gov.au/internet/msac/publishing.nsf/Content/D924E2F768B13C4BCA25801000123B9E/$File/1276%20-%20Final%20MSAC%20PSD%20-%20NCSP%20Renewal.pdf)
26. Lew J-B, Simms K, Smith MA, Hall M, Kang Y-J, Xu XM, et al. Primary HPV testing versus cytology-based cervical screening in women in Australia vaccinated for HPV and unvaccinated: effectiveness and economic assessment for the National Cervical Screening Program. *Lancet Public Health* 2017;2(2):e96–e106.
27. Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Caesarean section. Patient information pamphlet. East Melbourne: RANZCOG; 2016 [cited 2016 Nov 28]. Available from: https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Patient%20Information/Caesarean-section-pamphlet.pdf?ext=.pdf
28. National Institute for Health and Care Excellence. Caesarean section. Clinical guideline 132. London: NICE; 2011. Available from: <https://www.nice.org.uk/guidance/cg132>
29. Doan E, Gibbons K, Tudehope D. The timing of elective caesarean deliveries and early neonatal outcomes in singleton infants born 37–41 weeks' gestation. *Aust N Z J Obstet Gynaecol* 2014;54(4):340–7.
30. Tita AT, Landon MB, Spong CY, Lai Y, Leveno KJ, Varner MW, et al. Timing of elective repeat cesarean delivery at term and neonatal outcomes. *N Engl J Med* 2009;360(2):111–20.
31. Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Timing of elective caesarean section at term. East Melbourne: RANZCOG; 2014. Available from: [https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Timing-of-elective-caesarean-section-\(C-Obs-23\)-Review-November-2014.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Timing-of-elective-caesarean-section-(C-Obs-23)-Review-November-2014.pdf?ext=.pdf)
32. American College of Obstetricians and Gynecologists. ACOG committee opinion no. 561: nonmedically indicated early-term deliveries. *Obstet Gynecol* 2013;121(4):911–15.
33. Bentley JP, Roberts CL, Bowen JR, Martin AJ, Morris JM, Nassar N. Planned birth before 39 weeks and child development: a population-based study. *Pediatrics* 2016;138(6).
34. Lindstrom K, Lindblad F, Hjern A. Preterm birth and attention-deficit/hyperactivity disorder in schoolchildren. *Pediatrics* 2011;127(5):858–65.
35. Australian Institute of Health and Welfare. Australia's health 2014: caesarean section snapshot. Australia's health series no. 14. Cat. no. AUS 178. Canberra: AIHW; 2014. Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129547757>
36. Robson SJ, de Costa CM. Thirty years of the World Health Organization's target caesarean section rate: time to move on. *Med J Aust* 2017;206(4):181–5.

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References continued

37. Wills R, Johnston T. Morbidity and mortality associated with older maternal age at birth. Brisbane: Queensland Health – Health Statistics Unit; 2013. Available from: https://www.health.qld.gov.au/__data/assets/pdf_file/0028/361486/statbite56.pdf
38. Australian Institute of Health and Welfare. National core maternity indicators – stage 3 and 4: results from 2010–2013. Canberra: AIHW; 2016. Cat. no. PER 84. Available from: <http://www.aihw.gov.au/publication-detail/?id=60129555634>
39. O'Leary CM, de Klerk N, Keogh J, Pennell C, de Groot J, York L, et al. Trends in mode of delivery during 1984–2003: can they be explained by pregnancy and delivery complications? *BJOG* 2007;114(7):855–64.
40. Dahlen HG, Tracy S, Tracy M, Bisits A, Brown C, Thornton C. Rates of obstetric intervention among low-risk women giving birth in private and public hospitals in NSW: a population-based descriptive study. *BMJ Open* 2012;2(5).
41. Australian Institute of Health and Welfare. Australia's mothers and babies 2014: in brief. Perinatal statistics series no. 32. Cat no. PER 87. Canberra: AIHW; 2016. Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129557657>
42. Royal College of Obstetricians and Gynaecologists. The management of third- and fourth-degree perineal tears. Green-top guideline No. 29. London: RCOG; 2015. Available from: <https://www.rcog.org.uk/globalassets/documents/guidelines/gtg-29.pdf>
43. National Institute for Health and Care Excellence. Intrapartum care for healthy women and babies. Clinical Guideline 190 (last updated February 2017). London: NICE; 2014. Available from: <https://www.nice.org.uk/guidance/cg190/chapter/Recommendations#second-stage-of-labour>
44. Laine K, Gissler M, Pirhonen J. Changing incidence of anal sphincter tears in four Nordic countries through the last decades. *Eur J Obstet Gynecol Reprod Biol* 2009;146(1):71–5.
45. Gurol-Urganci I, Cromwell DA, Edozien LC, Mahmood TA, Adams EJ, Richmond DH, et al. Third- and fourth-degree perineal tears among primiparous women in England between 2000 and 2012: time trends and risk factors. *BJOG* 2013;120(12):1516–25.
46. Ismail SI, Puyk B. The rise of obstetric anal sphincter injuries (OASIS): 11-year trend analysis using Patient Episode Database for Wales (PEDW) data. *J Obstet Gynaecol* 2014;34(6):495–8.
47. Jango H, Langhoff-Roos J, Rosthoj S, Sakse A. Modifiable risk factors of obstetric anal sphincter injury in primiparous women: a population-based cohort study. *Am J Obstet Gynecol* 2014;210(1):59 e1–e6.
48. Dahlen H, Priddis H, Schmied V, Sneddon A, Kettle C, Brown C, et al. Trends and risk factors for severe perineal trauma during childbirth in New South Wales between 2000 and 2008: a population-based data study. *BMJ Open* 2013;3(5).
49. Baghurst PA. The case for retaining severe perineal tears as an indicator of the quality of obstetric care. *Aust N Z J Obstet Gynaecol* 2013;53(1):3–8.
50. Ampt AJ, Ford JB, Roberts CL, Morris JM. Trends in obstetric anal sphincter injuries and associated risk factors for vaginal singleton term births in New South Wales 2001–2009. *Aust N Z J Obstet Gynaecol* 2013;53(1):9–16.