National Institute for Health and Care Excellence

Draft for consultation

Caesarean birth

[A] Evidence review of the benefits and risks of planned caesarean birth

NICE guideline CG132 (update)

Evidence review

October 2020

Draft for Consultation

This evidence review was developed by the National Guideline Alliance which is a part of the Royal College of Obstetricians and Gynaecologists

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Benefits and risks of planned caesarean birth

Review question

What are the benefits and risks (short and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

Introduction

Planned caesarean birth (CB) is an alternative to planned vaginal birth (VB) for women with a number of conditions diagnosed antenatally, or on request for women with no specific medical indication. However, there can be risks associated with both modes of birth for both the woman and baby, and there is also the potential for the mode of birth to lead to longer-term risks for the woman and her child.

The aim of this question is to identify the short- and long-term benefits and risks of planned caesarean birth compared to planned vaginal birth to allow women to make an informed decision.

Summary of the protocol

See Table 1 for a summary of the Population, Intervention, Comparison and Outcome (PICO) characteristics of this review.

Table 1: Summary of the protocol (PICO table)

Population	Pregnant women giving birth near/ at term • Include: ○ singleton primiparous and multiparous women ○ no age restriction ○ lower segment transverse incision (not classical) • Exclude: ○ studies from low/middle income countries ○ studies with data which has not been adjusted for relevant confounders
Intervention	Short-term outcomes: Elective caesarean birth (planned mode of birth) Long-term outcomes: Elective caesarean birth (planned or actual mode of birth)
Comparison	Short-term outcomes: Planned vaginal birth Long-term outcomes: Planned vaginal birth or actual vaginal birth
Outcomes	**Maternal short-term (time period: up to 6 weeks)** • Bladder/bowel/ureteric injury • Major obstetric haemorrhage • Health-related quality of life (HRQOL) • Maternal death

	• ITU/HDU admission • Peri-partum hysterectomy • Thromboembolic disease **Maternal long-term (at any time after 6 weeks, unless otherwise specified)** <u>Outcomes in any future pregnancy</u> • Placenta accreta/morbidly adherent placenta/abnormally invasive placenta • Uterine rupture • Stillbirth <u>Other outcomes</u> • Urinary incontinence > 1 year postpartum • Faecal incontinence > 1 year postpartum • Postnatal depression (PND) • Post-traumatic stress disorder (PTSD) **Infant short-term (refers to early neonatal period – up to 7 days of life)** • Perinatal mortality: includes stillbirth and mortality during first 7 days of life • Admission to neonatal unit • Respiratory morbidity • Moderate or severe hypoxic ischaemic encephalopathy • Nerve injury (including brachial plexus injury, phrenic nerve injury or facial nerve injury) • Intracranial or extracranial haemorrhage • Infectious morbidity **Children long-term (refers to period between 7 days of life, until 18 years of age)** • Neonatal/infant/child mortality • Cerebral palsy • Moderate/severe neurodevelopmental delay • Obesity (childhood) • Asthma • Type 1 diabetes • Autism spectrum condition

HDU: high dependency unit; HRQoL: health-related quality of life; ITU: intensive treatment unit; PND: postnatal depression; PTSD: post-traumatic stress disorder

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual (2014). Please see the methods chapter for further details. Methods specific to this review question are described in the review protocol in appendix A.

Declarations of interest were recorded according to NICE's 2014 conflicts of interest policy until 31 March 2018. From 1 April 2018, declarations of interest were recorded according to NICE's 2018 conflicts of interest policy. Those interests declared until

April 2018 were reclassified according to NICE's 2018 conflicts of interest policy (see Register of Interests).

Clinical evidence

Clinical evidence was presented separately for short- and long-term outcomes because PICO criteria differed between these 2 outcome sets.

For short-term outcomes, analysis was "intention to treat"; women who planned for a vaginal birth (but ended up with either vaginal birth or an emergency caesarean birth) were compared to those who planned for a caesarean birth (but in a few cases may have had vaginal birth instead). This was to ensure that studies reflected the relevant risks during the antenatal period when a woman is planning mode of birth.

For long-term outcomes, as it was anticipated that data from studies reporting results by planned mode of birth would be sparse, the review also included studies reporting outcomes by actual mode of birth. For outcomes reported by actual mode of birth, the review prioritised studies that only included elective caesarean birth, and not those which were done as an emergency. Including emergency caesarean births is likely to bias outcomes against the caesarean birth arm because those women planning for vaginal births but requiring emergency caesarean would be analysed under this heading. Studies that did include emergency caesarean births were therefore only included when no other evidence was available and were downgraded for indirectness.

The main aim of this review was to provide information for women requesting a caesarean birth in the absence of a clinical indication. Therefore, studies including pregnant women with breech presentations, multi-fetal pregnancies, preterm births, babies who are small for gestational age, placenta praevia, and maternal infections have been excluded.

Included studies

Maternal and infant short-term outcomes:

Three cohort studies (Herdstad 2016, Lavecchia 2016, MacDorman 2008) and one case-control study (Karlstrom 2013) relevant for the maternal and infant short-term outcomes were included (N=8,493,744).

Participants consisted of women near/at term undergoing elective caesarean birth or planned vaginal birth, as defined by the studies. Because not all birth records document the intended mode of birth, this classification was approached in different ways by the included studies:

- Herdstad 2016 had records of those with planned vaginal birth. They established the elective caesarean birth group by excluding women with complications associated with elective caesarean birth. Results from this study have been downgraded for indirectness, as there was no information about the caesarean births being planned in advance; therefore, the results for the intervention group were reported according to actual mode of birth.
- Karlstrom 2013 included women undergoing caesarean birth without medical indication. The planned vaginal birth group consisted of women undergoing birth with spontaneous onset of labour and the intention of a vaginal birth. Results were reported by those who ended up having a vaginal birth and

those who had an emergency caesarean birth; therefore, these have been downgraded for indirectness as were reported by actual mode of birth.

- Lavecchia 2016 established planned vaginal births by excluding women with high-risk pregnancies and identifying those who had labour or induction of labour. Because there is no an International Classification of Diseases version 9 (ICD-9) code for elective primary caesarean birth, caesarean birth in the absence of labour was used as a surrogate intervention.
- MacDorman 2008 established elective caesarean birth by excluding those with caesarean birth with labour complications or procedures. Women in the planned vaginal birth group were those who had a vaginal birth and a caesarean birth with labour complications or procedures.

Evidence was identified for all short-term outcomes except for bladder/bowel/ureteric injury, maternal satisfaction, moderate or severe hypoxic ischaemic encephalopathy, nerve injury (including brachial plexus injury, phrenic nerve injury or facial nerve injury) and intracranial or extracranial haemorrhage.

Maternal and baby/child long-term outcomes

Fifteen cohort studies (Axelsson 2019, Black 2015, Clausen 2016, Curran 2015, Curran 2016, Franz 2009, Handa 2011, Hanrahan 2019, Khashan 2014, MacArthur 2011, Masukume 2019a, Masukume 2019b, Masukume 2018, Moshkovsky 2018, Yip 2017), 3 systematic reviews (Huang 2015, Keag 2018, Xu 2017), 1 cross-sectional (Bahtiyar 2006), and 1 case-control study (Petridou 1996) relevant for the maternal and baby/child long-term outcomes were included (N= 25,836,412). Participants consisted of women at/near term undergoing elective caesarean birth, with the exception of the studies reporting on risk in any future pregnancy, namely placenta accreta, uterine rupture and stillbirth for which, in the absence of studies reporting on elective caesarean birth only, studies including women who had any type of caesarean birth (emergency/elective) were included.

Evidence was identified for all long-term outcomes, except post-traumatic stress disorder (PTSD) in women.

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Excluded studies

Studies not included in this review, with reasons for their exclusion, are provided in appendix K.

Summary of clinical studies included in the evidence review

Summaries of the studies that were included in this review are presented in Table 2 and Table 3.

Table 2: Summary of included studies for short-term outcomes

Study	Participants	Intervention	Control	Outcomes	Comments
Herstad 2016 Population-based	N=6,672 women	Elective caesarean birth, n=373	Unassisted planned vaginal birth, n=6,299	• Major obstetric haemorrhage (defined as ≥1500 ml of visually estimated	• All women were ≥35 years old • Results were adjusted for

Study	Participants	Intervention	Control	Outcomes	Comments
retrospective registry study Norway				blood loss within 24 hours postpartum) • Intensive treatment unit admission • Admission to neonatal unit • Respiratory morbidity (defined as "transitory tachypnea", "respiratory distress", "meconium aspiration", "use of respirator", and "continuous positive airway pressure") • Infectious morbidity	year of birth, hospital size, gestational age and maternal age
Karlstrom 2013 Retrospective case-control registry study Sweden	N=18,813 women	Elective caesarean birth, n=5,877	Unassisted planned vaginal birth, n=12,936	• Bleeding complications (definition was not reported) • Respiratory distress syndrome • Infectious morbidity	• Results were adjusted for age, parity, country of birth, BMI, infertility, and length of pregnancy
Lavecchia 2016 Population-based retrospective registry study Canada	N= 442,067 women	Elective caesarean birth, n=35,170	Planned vaginal birth, n=406,897	• Postpartum haemorrhage (definition not reported) • Maternal death • Peri-partum hysterectomy • Thromboembolic disease	• All women were ≥35 years old • Results were adjusted for: age, race, income, hospital type, hospital location, and type of insurance
MacDorman 2008 Retrospective cohort study US	N= 7,409,247	Elective caesarean birth, n= 271,179	Planned vaginal birth, n=7,138,068	• Neonatal mortality	• Results were adjusted for: maternal age, race/ ethnicity, education, parity, smoking, infant birthweight and gestational age

1 *BMI: body mass index*

Table 3: Summary of included studies for long-term outcomes

Study	Participants	Intervention	Control	Outcomes	Comments
Axelsson 2019 Population-based prospective cohort study Denmark	N=616,977 children and young people	Elective caesarean birth, n=63,240	Vaginal birth, n= 553,737	• Autism spectrum condition	• Unclear whether all children included were born at term • Results were adjusted for: childhood antibiotic use; birth mode; maternal age at birth; parental age difference; parental education; maternal marital status; maternal smoking; infant sex; 5-minute Apgar score; use of CPAP or a ventilator; asphyxia; parental epilepsy; pre-eclampsia or hypertension; gestational diabetes; parity; maternal antibiotic use during pregnancy; maternal infections during pregnancy; paternal psychiatric history
Bahtiyar 2006 Cross-sectional US	N=9,287,701 women	Previous caesarean birth, n per group was not reported	Previous vaginal birth, n per group was not reported	• Subsequent stillbirth in a term pregnancy	• Any type of caesarean birth (emergency and elective) was included • Interpregnancy intervals were not reported • Results were adjusted for: maternal age, race, underlying medical conditions, and fetal congenital abnormalities

Study	Participants	Intervention	Control	Outcomes	Comments
Black 2015 Population-based retrospective data-linkage study UK	N=265,272 children for the outcomes type 1 diabetes and mortality and N= 51,568 chidren and young people for the outcome obesity	Planned caesarean birth, n= 12,355 for the infant mortality and type 1 diabetes outcomes and n=2,682 for the obesity outcome	Vaginal birth, n= 252,917 for the infant mortality and type 1 diabetes outcomes and n= 48,886 for the obesity outcome	• Infant mortality (up to 1 year of age) • Obesity at age 5 • Type 1 diabetes up to 21 years old	• Only primiparous women were included • Results were adjusted for: maternal age, maternal Carstais decile, maternal smoking status, estimated gestational age at birth, off-spring birth weight, offspring sex, year of birth, and breastfeeding status at 6 weeks • The outcome childhood type 1 diabetes was additionally adjusted for maternal type 1 diabetes • The outcome obesity at age 5 was additionally adjusted for maternal BMI
Clausen 2016 Population-based retrospective cohort study Denmark	N=1,620,401 children and young people	Elective caesarean birth, n= 122,789	Vaginal birth, n= 1,497,612	• Type 1 diabetes up to age 15	• Results were adjusted for: year of birth, maternal and paternal age at childbirth, maternal and paternal educational level, maternal and paternal type 1 diabetes diagnosed before childbirth
Curran 2015 Population-based retrospective cohort study Sweden	N= 2,325,453 children and young people	Elective caesarean birth, n=164,305	Unassisted vaginal birth, n=2,161,148	• Autism spectrum condition	• Results were adjusted for: year of birth, infant sex, maternal age, gestational age, 5 minute APGAR score, maternal and paternal country

Study	Participants	Intervention	Control	Outcomes	Comments
					of birth, small for gestational age, large for gestational age, first born, family income, maternal and paternal depression, bipolar disorder, and non-affective disorder
Curran 2016 Retrospective cohort study UK	N=7,367 children and young people	Elective caesarean birth, n=1,050	Unassisted vaginal birth, n= 6,317	• Autism spectrum condition	• 7% of children were born between 24 and 36 weeks GA; the total % of those giving birth before 34 weeks GA was not reported • Results were adjusted for: small for gestational age, gestational age, maternal high blood pressure/pre-eclampsia, maternal smoking during pregnancy, being the first born child, bleeding or threatened miscarriage during pregnancy, and infant age when he/she came home from the hospital, poverty, ethnicity, maternal age, maternal education, urbanicity, single parent household at time of first survey, paternal age, and paternal education,

Study	Participants	Intervention	Control	Outcomes	Comments
					maternal depression, maternal BMI, whether the pregnancy was a surprise, and maternal irritable bowel syndrome
Franz 2009 Retrospective cohort study Germany	N= 629,815 women	Previous caesarean birth, n= 94,538	Previous vaginal birth, n=535,277	• Stillbirth in a second pregnancy	• Any type of caesarean birth (emergency and elective) was included • Interpregnancy intervals were not reported • Study included women from 23 weeks GA. Total number of pre-term births was not reported • Results were adjusted for: diabetes mellitus, smoking, advanced maternal age, previous premature stillbirth, previous small for gestational age birth, previous neonatal death and previous stillbirth
Handa 2011 Prospective cohort study US	N=643 women	Elective caesarean birth, n=192	Unassisted vaginal birth, n=325, assisted vaginal birth, n=126	• Stress urinary incontinence symptoms 5 to 10 years after birth • Anal incontinence symptoms 5 to 10 years after birth	• Results were adjusted for: African American ethnicity, maternal age >35 years old, obesity, and multiparity
Hanrahan 2019 Prospective cohort study	N=6,866 children and young people	Planned caesarean birth, n=846	Unassisted vaginal birth, n=6,020	• Persistent verbal delay	• 10.4% of births were pre-term • Results were adjusted for: gender,

Study	Participants	Intervention	Control	Outcomes	Comments
UK					ethnicity, number of siblings, maternal age, maternal pre-pregnancy body mass index, maternal highest educational attainment, paternal highest educational attainment, maternal smoking during pregnancy, pre-eclampsia, index of multiple deprivation quintile
Huang 2015 Systematic review and meta-analysis China	K=8, N=2,782,769 children and young people	Planned caesarean birth, n per group was not reported	Vaginal birth, n per group was not reported	• Asthma	• The study does not report the confounders it adjusted for
Keag 2018 Systematic review and meta-analysis UK	K=9, N=1,318,640 women	Previous caesarean birth, n per group was not reported	Previous vaginal birth, n per group was not reported	• Placenta accreta in any future pregnancy • Uterine rupture in any future pregnancy • Stillbirth in any future pregnancy	• Any type of caesarean birth (emergency and elective) was included • Interpregnancy intervals were not reported • For all included studies, there were pre-term births in the first pregnancy (% was not reported) • Results were adjusted for different confounders, mainly maternal age, parity, BMI, and maternal complications in a previous pregnancy, such as hypertension, pre-term birth or diabetes

Study	Participants	Intervention	Control	Outcomes	Comments
Khashan 2014 Population-based retrospective cohort study Sweden	N= 2,253,979 children and young people	Elective caesarean birth, n= 159,498	Vaginal birth, n=2,094,481	• Type 1 diabetes before age 15	• Results were adjusted for: small for gestational age, large for gestational age, gestational age, birth order, pre-eclampsia, infant sex, maternal age, BMI, pre-pregnancy diabetes, maternal education level, and gestational diabetes
MacArthur 2011 Retrospective cohort study UK and New Zealand	N=1,976 women	Elective caesarean birth, n=124	Unassisted vaginal birth, n=1,852	• Urinary incontinence 12 years after birth • Faecal incontinence 12 years after birth	• Unclear whether all children included were born at term • Results were adjusted for: parity, body mass index and age at first birth
Masukume 2019a Prospective cohort study New Zealand	N=5,059 children	Planned caesarean birth, n=618	Unassisted vaginal birth, n=4,441	• Childhood obesity	• Unclear whether all children included were born at term • Results were adjusted for: maternal age, education, marital status, infant sex, maternal smoking during pregnancy, pre-pregnancy BMI, gestational age at birth, birth weight, parity and diabetes mellitus
Masukume 2019b Prospective cohort study Ireland	N= 626 children	Elective caesarean birth, n=156	Unassisted vaginal birth, n=470	• Childhood overweight or obesity	• Results were adjusted for: maternal age, education, ethnicity, marital status, infant sex, maternal smoking during pregnancy, maternal BMI at

Study	Participants	Intervention	Control	Outcomes	Comments
					the first antenatal visit, gestational age at birth, birth weight and pre-eclampsia
Masukume 2018 Retrospective cohort study Ireland	N=7,981 children	Elective caesarean birth, n=1,402	Unassisted vaginal birth, n= 6,579	• Childhood obesity	• Results were adjusted for: maternal age, education, ethnicity, marital status, region, infant sex, gestational age, pre-eclampsia, gestational diabetes, and parity
Moshkovsky 2018 Population-based retrospective cohort study Israel	N=131,880 children	Elective caesarean birth, n=11,780	Unassisted vaginal birth, n=120,112	• Childhood obesity	• Results were adjusted for: maternal obesity (BMI ≥30 kg/m^2), maternal age, gestational age, birth weight and maternal group B streptococcus colonization status
Petridou 1996 Case-control Greece	N=293 children	Planned caesarean birth, n=22	Vaginal birth, n=271	• Cerebral palsy	• 10.6% of children were born before 32 weeks GA • 7.5% of children were born between 33 and 36 weeks GA • Results were adjusted for: gender, age at interview, and maternal age at birth
Xu 2017 Systematic review and meta-analysis China	K=6, N=13,221 women	Elective caesarean birth, n per group was not reported	Vaginal birth, n per group was not reported	• Post-partum depression	• The study does not report the confounders it adjusted for
Yip 2017 Population-based	N= 4,559,493 children	Planned caesarean birth, n=243,749	Unassisted vaginal birth, n=4,315,477	• Autism spectrum condition	• 4.05% were born before 36 weeks GA. Unclear % born

Study	Participants	Intervention	Control	Outcomes	Comments
retrospective cohort study Norway, Sweden, Denmark, Finland, Australia					before 34 weeks GA • Results were adjusted for gestational age, site, maternal age and birth year

APGAR: Appearance, pulse, grimace, activity, and respiration; BMI: body mass index; CPAP: continuous positive airway pressure; GA: gestational age; IQR: interquartile range

See the full evidence tables in appendix D and the forest plots in appendix E.

Quality assessment of clinical studies included in the evidence review

See the evidence profiles in appendix F.

Economic evidence

Included studies

A systematic review of the economic literature was conducted but no economic studies were identified which were applicable to this review question.

See the literature search strategy in appendix B.

Economic model

No economic modelling was undertaken for this review because the review was not a comparison of competing courses of action and therefore was not considered relevant for economic analysis.

Evidence statements

Comparison 1. Elective caesarean birth versus planned vaginal birth (short-term outcomes)

Maternal outcomes

Bladder/bowel/ureteric injury

No evidence was available for this outcome.

Major obstetric haemorrhage

One observational study (N=6,672) provided very low quality evidence to show that there was no clinically important difference in the occurrence of major obstetric haemorrhage (*defined as >1500 ml of visually estimated blood lost within 24 hours postpartum*) between those who had an elective caesarean birth or a planned vaginal birth.

Bleeding complications

One observational study (N=18,813) provided very low quality evidence to show that those who had an elective caesarean birth experienced a clinically important

increase in bleeding complications, as compared to those who had a planned vaginal birth.

Postpartum haemorrhage

One observational study (N=442,067) provided very low quality evidence to show that those who had an elective caesarean birth experienced a clinically important decrease in postpartum haemorrhage, as compared to those who had a planned vaginal birth.

Maternal satisfaction/health related quality of life (HRQOL)

No evidence was available for this outcome.

Maternal death

One observational study (N=442,067) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in maternal death, as compared to those who had a planned vaginal birth.

ITU/HDU admission

One observational study (N=6,672) provided very low quality evidence to show that there was no clinically important difference in intensive care unit admissions between those who had an elective caesarean birth or a planned vaginal birth.

Peri-partum hysterectomy

One observational study (N=442,067) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in the occurrence of peri-partum hysterectomy, as compared to those who had a planned vaginal birth.

Thromboembolic disease

One observational study (N=442,067) provided very low quality evidence to show that there was no clinically important difference in the occurrence of thromboembolic disease between those who had an elective caesarean birth or a planned vaginal birth.

Infant outcomes

Neonatal mortality

One observational study (N=7,409,247) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in the occurrence of neonatal mortality, as compared to those who had a planned vaginal birth.

Admission to neonatal unit

One observational study (N=6,672) provided very low quality evidence to show that there was no clinically important difference in the number of babies requiring admission to a neonatal unit between those who had an elective caesarean birth or a planned vaginal birth.

Respiratory morbidity

One observational study (N=6,672) provided very low quality evidence to show that there was no clinically important difference in the number of babies experiencing respiratory morbidity (*defined as transitory tachypnea, respiratory distress, meconium aspiration, use of respirator and cont*inuous positive airway pressure) between those who had an elective caesarean birth or a planned vaginal birth.

Respiratory distress syndrome

One observational study (N=18,813) provided very low quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in the occurrence of babies experiencing respiratory distress syndrome, as compared to those who had a planned vaginal birth.

Moderate or severe hypoxic ischaemic encephalopathy

No evidence was available for this outcome.

Nerve injury (including brachial plexus injury, phrenic nerve injury or facial nerve injury)

No evidence was available for this outcome.

Intracranial or extracranial haemorrhage

No evidence was available for this outcome.

Infectious morbidity (reported as odds ratio [OR])

One observational study (N=6,672) provided very low quality evidence to show that there was no clinically important difference in babies experiencing infectious morbidity between those who had an elective caesarean birth or a planned vaginal birth.

Infectious morbidity (reported as risk ratio [RR])

One observational study (N=18,813) provided very low quality evidence to show that there was no clinically important difference in babies experiencing infectious morbidity between those who had an elective caesarean birth or a planned vaginal birth.

Comparison 2. Elective caesarean birth versus planned vaginal birth (long-term outcomes)

Maternal outcomes

Placenta accreta in any future pregnancy

One systematic review including 3 observational studies (N=698,374) provided very low quality evidence to show that that those who had had a caesarean birth experienced a clinically important increase in placenta accreta in any future pregnancy as compared to those who had had a vaginal birth.

Uterine rupture in any future pregnancy

One systematic review including 4 observational studies (N=834,475) provided very low quality evidence to show that that those who had had a caesarean birth experienced a clinically important increase in uterine rupture in any future pregnancy as compared to those who had had a vaginal birth.

Stillbirth in a second pregnancy (reported as OR)

One systematic review including 10 observational studies (N=972,134) provided very low quality evidence to show that that those who had had a caesarean birth experienced a clinically important increase in stillbirth in any future pregnancy as compared to those who had had a vaginal birth.

Stillbirth in a second pregnancy (reported as hazard ratio [HR])

One observational study (N=626,815) provided very low quality evidence to show that there was no clinically important difference in stillbirth in a second pregnancy between those who had had a caesarean birth or a vaginal birth.

Stillbirth in a subsequent pregnancy (reported as RR)

One observational study (N=9,287,701) provided very low quality evidence to show that those who had a caesarean birth experienced a clinically important decrease in stillbirth in a subsequent pregnancy as compared to those who had had a vaginal birth.

Urinary incontinence> 1 year postpartum (compared to unassisted vaginal birth)

Two observational studies (N=2,493) provided very low quality evidence to show that those who had an elective caesarean birth experienced a clinically important decrease in urinary incontinence from 1 year postpartum as compared to those who had an unassisted vaginal birth.

Urinary incontinence> 1 year postpartum (compared to assisted vaginal birth)

Two observational studies (N=318) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important decrease in urinary incontinence from 1 year postpartum as compared to those who had an assisted vaginal birth.

Faecal incontinence >1 year postpartum (compared to unassisted vaginal birth)

Two observational studies (N=2,493) provided very low quality evidence to show that there was no clinically important difference in the occurrence of faecal incontinence from 1 year postpartum in those who had an elective caesarean birth or an unassisted vaginal birth.

Faecal incontinence >1 year postpartum (compared to assisted vaginal birth)

One observational study (N=318) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important decrease in faecal incontinence from 1 year postpartum as compared to those who had an assisted vaginal birth.

Postnatal depression

One systematic review including 6 observational studies (N=13,221) provided very low quality evidence to show that there was no clinically important difference in the occurrence of postnatal depression between those who had an elective caesarean birth or a planned vaginal birth.

Post-traumatic stress disorder

No evidence was available for this outcome.

Children long-term

Infant mortality (up to 1 year of age)

One observational study (N=265,272) provided very low quality evidence to show that there was no clinically important difference in the occurrence of infant mortality between those who had an elective caesarean birth or a vaginal birth.

Cerebral palsy

One observational study (N=293) provided very low quality evidence to show that those who had an elective caesarean birth experienced a clinically important decrease in cerebral palsy as compared to those who had a vaginal birth.

Persistent verbal delay

One observational study (N=265,272) provided very low quality evidence to show that there was no clinically important difference in the occurrence of persistent verbal delay between those who had an elective caesarean birth or a vaginal birth.

Childhood obesity (reported as HR)

Two observational studies (N=397,152) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in childhood obesity as compared to those who had a vaginal birth.

Childhood obesity (reported as RR)

Three observational studies (N=13,666) provided very low quality evidence to show that there was no clinically important difference in the occurrence of childhood obesity between those who had an elective caesarean birth or a vaginal birth.

Asthma

One systematic review including 8 observational studies (N=2,782,769) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in asthma as compared to those who had a vaginal birth.

Type 1 diabetes (reported as RR)

One observational study (N=2,248,979) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in type 1 diabetes as compared to those who had a vaginal birth.

Type 1 diabetes (reported as HR)

Two observational studies (N=1,885,673) provided low quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in type 1 diabetes as compared to those who had a vaginal birth.

Type 1 diabetes (sibling control analysis)

One observational study (N=2,200), included above, also conducted a sibling control analysis which provided very low quality evidence to show that there was no clinically important difference in the occurrence of type 1 diabetes between those who had an elective caesarean birth or a vaginal birth.

Autism spectrum condition (reported as OR)

Two observational studies (N=4,566,860) provided very low to quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in autism spectrum condition as compared to those who had a vaginal birth.

Autism spectrum condition (reported as HR)

Two observational studies (N=2,942,430) provided very low to quality evidence to show that those who had an elective caesarean birth experienced a clinically important increase in autism spectrum condition as compared to those who had a vaginal birth.

Autism spectrum condition (sibling control analysis, reported as HR)

One observational study (total N was not reported), included above, also conducted sibling control analyses which provided very low quality evidence to show that there was no clinically important difference in the occurrence of autism spectrum condition between those who had an elective caesarean birth or a vaginal birth.

Autism spectrum condition (sibling control analysis, reported as OR)

One observational study (total N was not reported), included above, also conducted sibling control analyses which provided very low quality evidence to show that there was no clinically important difference in the occurrence of autism spectrum condition between those who had an elective caesarean birth or a vaginal birth.

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

The committee discussed the fact that there were a large number of outcomes which could be considered as potential benefits or risks of either caesarean birth or vaginal birth. However, the committee agreed to prioritise 28 outcomes (14 short-term and 14 long-term) for women and babies/infants/children. The committee acknowledged that there could be more outcomes relevant for decision-making, however they prioritised these 28 as they believed these were the most direct indicators of safety for mode of birth and would be the most informative ones for women's decision making. When planning mode of birth, women would need to decide which risks are more acceptable for them, therefore all outcomes were given an equal level of importance by the committee.

The quality of the evidence

The evidence was based on observational studies, the findings from which were low to very low as assessed by GRADE. All included studies reported estimates adjusted for potential confounders, however these were different across studies and based on variables established by the study authors. Reported findings represent associations between mode of birth and the different outcomes, therefore a causal link between these cannot be inferred.

The evidence was downgraded due to imprecision as 95% confidence intervals (CIs) crossed the line of no effect or were subjectively wide; due to inconsistency, as some studies reported contradictory findings for the same outcomes, and due to risk of bias (mainly selection and recall bias).

In order to capture the most relevant and direct evidence assessing the benefits and risks of women planning to have a caesarean birth compared to women planning to have a vaginal birth, a hierarchy of comparisons was established for inclusion. Studies comparing women who planned to have a caesarean birth compared to women who planned to have a vaginal birth were prioritised. For long-term outcomes only, studies including actual caesarean birth (only elective) compared to actual vaginal birth were also considered for inclusion. If no direct evidence was found for long-term outcomes, then actual caesarean birth (including emergency caesarean birth) versus actual vaginal birth was included.

Studies reporting short-term outcomes were downgraded due to indirectness if their groups were based on actual mode of birth. Studies reporting long-term outcomes based on actual mode of birth were not downgraded for indirectness as it was anticipated that longer term risks would likely be reported according to actual mode of birth. The committee took this limitation of the evidence base into account in their decision making.

Studies including both elective and emergency caesarean birth were only included for outcomes for which there was no direct evidence and were downgraded for indirectness.

The committee interpreted the evidence taking these limitations into account. However, they noted that most studies were sufficiently powered to detect differences between groups and, although conducted in a variety of countries besides the UK, were conducted in high income countries, therefore these were generalizable to the UK setting and the low-risk population of women relevant for this review.

The review preferentially included comparisons between caesarean birth and composite groups of any type of vaginal birth (which could be unassisted or assisted using, for example, ventouse or forceps). This is because women do not plan to have an assisted birth but this is a possible consequence of planning to have a vaginal birth that must be considered. However, some studies only reported evidence with the vaginal birth outcomes stratified by assisted and unassisted, and where this was the case the 2 comparisons were extracted separately. In the case of urinary incontinence this was more likely to occur in women who had a vaginal birth, regardless of this being unassisted or assisted. However, faecal incontinence from 1 year postpartum appeared to occur more frequently in women who had an assisted vaginal birth only, and the committee therefore agreed to list these risks separately, as described below.

Benefits and harms

Based on their knowledge and experience, the committee agreed some over-arching principles relating to the advice and information that should be discussed with women when planning their mode of birth, basing these on the recommendations from the previous version of the guideline. These principles included the fact that the benefits and risks of each mode of birth should be discussed with women to help them make decisions regarding mode of birth. The committee recognised that the relative value placed on each outcome will vary from woman to woman and will depend on her own individual circumstances, for example the planned place of birth and her plans for future pregnancies.

The evidence showed that there were some outcomes where there was no difference between planned caesarean birth and planned vaginal birth. For women, these outcomes were thromboembolic disease, major obstetric haemorrhage, and

postnatal depression. In addition, there was evidence that there was no difference in the rate of faecal incontinence 1 year after caesarean birth when compared to unassisted vaginal birth. For babies and children, the outcomes where there was no difference were admission to neonatal unit, infectious morbidity, infant mortality (up to 1 year), and persistent verbal delay.

The evidence relating to haemorrhage outcomes was mixed. The committee noted that a possible reason why studies were showing opposed estimates could be because of the definition of haemorrhage used. Two of the studies reported this outcome as 'postpartum haemorrhage' and 'bleeding complications', however they did not provide sufficient information to differentiate between major obstetric haemorrhage and other types of haemorrhage, so the committee concluded that it was likely that they had included major obstetric haemorrhage, amongst other haemorrhage-related complications. A third study reported 'major obstetric haemorrhage', defined as '1500 ml or more of visually estimated blood loss within 24 hours postpartum'. Because this definition matched the definition currently used in clinical practice, the committee based the estimates provided in the recommendations on this study, concluding major obstetric haemorrhage was likely to be the same for planned caesarean birth and planned vaginal birth.

The evidence showed that peripartum hysterectomy and maternal death were more likely to happen in women who plan a caesarean birth, however the committee emphasised the small absolute effect reported by the studies. Based on their knowledge and experience, the committee also carried forward from the previous guideline the fact that hospital stay is likely to be increased in women who have a caesarean birth compared to a vaginal birth. Although hospital stay had not been included as an outcome in this review due to the need to prioritise outcomes where new evidence may be most informative, the committee agreed that the increase was still true in their clinical experience.

The evidence showed that placenta accreta and uterine rupture in any future pregnancy were more likely to happen in women who had had a caesarean birth. Studies reporting on these outcomes included any type of caesarean birth because no direct evidence was found for these outcomes, which may represent an overestimation of the risk for those who have a planned caesarean birth. This is because emergency caesarean births are more prone to infection than planned, so the risk of placenta accreta and uterine rupture may be higher in emergency caesarean births than in planned caesarean births. The committee noted how the risk for these complications is also dependent on other factors, such as interpregnancy interval, therefore this should be taken into consideration when discussing possible risks.

For babies and children, the evidence showed that planned caesarean birth may increase the risk of neonatal mortality, asthma and childhood obesity. However, for the outcomes childhood obesity and neonatal mortality, the committee emphasised the very small absolute effect reported by the studies. The committee noted that the association between childhood obesity and caesarean birth reported by the studies may be due to the fact that babies who are large for gestational age are more likely to be delivered through caesarean to avoid the potential risks associated with vaginal birth in babies with this condition. Studies did typically attempt to address this confounding by adjusting for offspring birthweight although it is plausible there may be some residual confounding effects.

The evidence showed that urinary incontinence 1 year after the birth was less likely to occur in women who had a caesarean birth compared to those who had a vaginal

birth. There was also evidence that faecal incontinence 1 year after the birth was less likely in women who had a caesarean birth when compared to those who had an assisted vaginal birth, and the committee noted that this contrasted to the comparison with unassisted vaginal birth. The committee felt that it was particularly important to make this specific distinction for faecal incontinence. They emphasised that faecal incontinence is an extremely debilitating condition which dramatically reduces women's quality of life.

The outcomes of injury to vagina and perineal/abdominal pain were not included in the protocol for this review as the committee prioritised those outcomes where there may be some uncertainty. However, the committee agreed it was appropriate to keep the previous recommendation on these outcomes (that caesarean birth was associated with less injury to vagina, and was associated with less perineal/ abdominal pain) as they were consistent with the committee's clinical experience and it was not expected that the underlying evidence base had changed.

For some of the outcomes it was not possible to define the difference in the benefit or risk between caesarean birth and vaginal birth and these were grouped together to inform women of this uncertainty. This was either because the evidence was conflicting or because the evidence was of insufficient quality to assess whether there were any differences.

For maternal outcomes, there was 1 study reporting on intensive treatment unit (ITU) admission, which seemed to suggest there was no difference between caesarean birth or vaginal birth, but as the 95% CI was very wide, indicating great uncertainty around the effect estimate, the committee agreed that this outcome should be defined as 'uncertain'

The evidence relating to stillbirth in any future pregnancy was mixed. Studies reporting on this outcome included any type of caesarean birth as no direct evidence was found. The committee noted that included studies shared some features which may limit their applicability to current practice. For instance, the majority of included studies collected their data between 25 and 30 years ago and were conducted in countries with private healthcare systems. Some reasons why studies report conflicting results could include the definition of stillbirth used; with some studies including intrapartum stillbirths and others antepartum stillbirths. Similarly, some studies focused on explained stillbirths only while others on unexplained stillbirths. The gestational age at birth of the women included varied substantially, and studies did not consistently report how many women had a pre-term birth in the first or previous pregnancy, or adjusted for this confounder. The committee noted how interpregnancy interval was relevant to assess the risk of stillbirth in a future pregnancy, however not all studies reported this information, making more difficult to interpret the results. Overall the committee agreed that the inconsistency between the largest single study and the meta-analysed evidence from the systematic review represented mixed findings, rather than a clinically important increase or decrease in stillbirths following caesarean birth.

For babies or children, the evidence on respiratory morbidity was mixed. The committee noted that studies did not provide enough information to account for any discrepancies in the direction of the effect, therefore they agreed that for this outcome the results should be defined as uncertain.

There was 1 study reporting on cerebral palsy, which was considered to be at very high risk of bias, therefore the committee did not consider the results reliable. There were concerns regarding recall bias, because women were asked to report on their mode of birth; selection bias, because controls were either the neighbours of the

children with cerebral palsy or children with neurological conditions other than cerebral palsy. These factors possibly led to a very high prevalence of cerebral palsy, likely relating to study design. The committee also noted that the study was quite dated as cases were recruited between 1991 and 1993, therefore the results reported were not relevant to current practice. Based on this, the committee agreed that it was not possible to be certain about the risk of cerebral palsy with caesarean birth compared to vaginal birth.

There were 4 studies reporting on autism spectrum condition. The studies using conventional cohort analysis reported that autism spectrum condition was increased after a caesarean birth. However, 2 of the included studies also reported sibling control analysis, which showed no association between autism spectrum condition and caesarean birth. Sibling control analysis may deal with confounding more effectively than other multivariable methods applied to conventional cohort analysis. Based on this, the committee concluded that the association observed as part of the conventional cohort analysis may be due to residual confounding, for example unknown genetic and environmental factors.

There were 3 studies reporting on type 1 diabetes. The committee noted that for this outcome it was particularly important that studies controlled for paternal type 1 diabetes. This is because the risk of inheritance by an offspring is increased when the father has type 1 diabetes, as compared to when the mother has type 1 diabetes. If both the mother and the father have type 1 diabetes, then the risk is highest. Only 1 of the studies reporting on type 1 diabetes (Clausen 2016) adjusted for maternal and paternal type 1 diabetes, so the committee raised concerns about the results reported by the other studies, which were only adjusted for maternal type 1 diabetes. Furthermore, there was no association between type 1 diabetes and caesarean birth in the sibling control analysis, so the committee concluded that the association observed in the other studies was likely related to residual confounding.

There were a number of short- and long-term outcomes for women and babies for which evidence meeting inclusion criteria for this review was not identified, therefore the committee could not establish whether these were more likely with a caesarean birth or not. These outcomes were: maternal satisfaction, post-traumatic stress disorder (PTSD), moderate or severe hypoxic ischaemic encephalopathy (HIE), nerve injury (including brachial plexus injury, phrenic nerve injury or facial nerve injury), and intracranial or extracranial haemorrhage. The committee discussed that these factors should still be discussed with women and they highlighted this in a recommendation.

Cost effectiveness and resource use

The committee considered that their recommendations would not have a resource impact. It was already current practice to discuss the risks and benefits of alternative modes of birth during the antenatal period and this review has simply led to an update of the information that should be communicated to women. If the updated information led to changes in the choices that were made with respect to mode of birth, then the recommendations could potentially have a “downstream” effect on costs but the committee did not think the relatively minor changes to the information provided would have a significant impact on women’s choices.

Other factors the committee took into account

The committee noted that the inclusion of low risk populations meant that the evidence provided a good estimation of benefits and risks for women with uncomplicated pregnancies planning mode of birth. However, the committee agreed

that the evidence should be interpreted in light of some caveats and limitations, some of which may overestimate the risks of the outcomes under study. For instance, some of the studies included women above 35 years old only. This may overestimate absolute risks of adverse outcomes because older mothers are more likely to have comorbidities leading to complications than younger mothers. Furthermore, advanced maternal age may be a key factor significantly influencing planned caesarean birth in women. However, the committee agreed that the relative differences between the caesearean birth and vaginal birth groups in the over 35 years population specifically, were still appropriate to extrapolate to the general population.

Although all studies were conducted in high-income countries, the committee noted that some studies were conducted in countries where healthcare is mainly accessible through private funding and where there are usually less midwives available to support women during the antenatal period and at the time of birth, such as Canada or the US.

The committee discussed the best way to present the benefits and risks information to women. The committee noted that the previous guideline had presented the simple 'increased, decreased, no difference' information in the main body of the guideline and had included more detailed information in an appendix. This had been replicated in the current version, but with some information on the estimated baseline risk with vaginal birth and risk differences being included in the recommendations in a tabular format, and the detailed results summarised in appendix M. These results provide an idea of the likelihood of certain outcomes happening in women having a caesarean birth or a vaginal birth. The committee agreed that when discussing risks, women and healthcare professionals should consider both relative effects (relative risks [RRs], hazard ratios [HRs] and odd ratios [ORs]) and absolute effects. In the context of this review, reported relative effects have been adjusted for confounders, which are factors that may distort the association between the intervention (caesarean/vaginal birth) and the outcome. Relative effects represent the risk of a certain outcome happening in one group compared to the other, whereas absolute effects represent the risk of a certain outcome happening in a group, taking into account the baseline likelihood of the outcome in question. Interpreting only the relative effects may lead to an overestimation of the significance of a choice because, for example, in uncommon outcomes (such as maternal death or neonatal mortality), large relative effects can represent small absolute increases in risk due to the low baseline rate of this risk. Lastly, because relative effects have been adjusted for confounders in regression analyses, the direction of the relative effects may appear contradictory to the actual raw number of events in each group.

The committee also noted that the number of women included in the intervention group of some studies was very low compared to the control arm and they raised concerns about comparability of arms across some of the studies.

The committee were aware that there may be variation in access to maternal request caesarean birth, and that choice of mode of birth should be supported, appropriate to a woman's clinical needs and the decisions they have made about mode of birth, regardless of service configuration in their local area. They noted that the guideline already contained a recommendation to this effect on the later section on maternal request caesarean birth.

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Additional references

The following studies were not included in the review because the reported effect estimates did not substantially alter the overall estimate of included systematic reviews assessing the same outcome (see appendix L for further details)

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Appendices

Appendix A – Review protocol

Review protocol for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

Table 4: Review protocol for benefits and risks of planned caesarean birth compared with planned vaginal birth

Field (based on PRISMA-P)	Content
Key area in the scope	Benefits and risks of caesarean birth compared with vaginal birth for both women and babies
Draft review question from the previous guideline (to be deleted in the final version)	What is the effectiveness of planned caesarean birth compared with planned vaginal birth at term at improving maternal and neonatal outcomes?
Actual review question	What are the benefits and risks (short and long-term) of planned caesarean birth (CB) compared with planned vaginal birth (VB) at term for women and neonates/infants/children?
Type of review question	Intervention
Objective of the review	To determine the possible benefits and harms for the mother and infant of a planned caesarean birth, compared to planned vaginal birth, in order to provide information for women and health care professionals.
Eligibility criteria – **population**	Pregnant women giving birth near/at term • no age restriction • singleton • include lower segment transverse incision (not classical) For short-term outcomes: Include women with pregnancies at lower obstetric/medical risk (no absolute medical/obstetric indication for a caesarean birth), analysed according to **planned** mode of birth For long-term outcomes: Include women with any indication for caesarean birth, analysed according to **actual** mode of birth (elective caesarean compared to vaginal birth).
Eligibility criteria – intervention	Short-term outcomes:

Field (based on PRISMA-P)	Content
	Elective caesarean birth (planned mode of birth) <u>Long-term outcomes:</u> Elective caesarean birth (planned or actual mode of birth)
Eligibility criteria – comparator	<u>Short-term outcomes:</u> Planned vaginal birth <u>Long-term outcomes:</u> Planned vaginal birth or actual vaginal birth
Outcomes and prioritisation	**MATERNAL short-term (time period: up to 6 weeks)** • Bladder/bowel/ureteric injury • Major obstetric haemorrhage • Maternal satisfaction/health related quality of life (HRQOL) • Maternal death • ITU/HDU admission • Peri-partum hysterectomy • Thromboembolic disease **MATERNAL long-term (at any time after 6 weeks, unless otherwise specified)** <u>Outcomes in any future pregnancy</u> • Placenta accreta/morbidly adherent placenta/abnormally invasive placenta • Uterine rupture • Stillbirth <u>Other outcomes</u> • Urinary incontinence > 1 year postpartum • Faecal incontinence > 1 year postpartum • Postnatal depression (PND) • Post-traumatic stress disorder (PTSD) **INFANT short-term** (refers to early neonatal period – up to 7 days of life) • Perinatal mortality ○ includes stillbirth and mortality during first 7 days of life

Field (based on PRISMA-P)	Content
	• Admission to neonatal unit • Respiratory morbidity • Moderate or severe hypoxic ischaemic encephalopathy • Nerve injury (including brachial plexus injury, phrenic nerve injury or facial nerve injury) • Intracranial or extracranial haemorrhage • Infectious morbidity **CHILDREN long-term** (refers to period between 7 days of life, until 18 years of age) • Neonatal/infant/child mortality • Cerebral palsy (dichotomous outcome, reported as present/absent, not severity of condition) • Moderate/severe neurodevelopmental delay (dichotomous outcome, not continuous outcomes such as mean change in score): - score of ≥1SD below normal on validated assessment scales, or Bayley's assessment scale of mental development index [MDI] or psychomotor developmental index [PDI] ≤84, or complete inability to assign score due to CP or severe cognitive delay) • Obesity (childhood) • Asthma • Type 1 diabetes • Autism spectrum condition (dichotomous outcome, present/absent, not severity of condition)
Eligibility criteria – **study design**	Only published full text papers in English • Systematic reviews/meta-analyses of randomised controlled trials • Systematic reviews/meta-analyses of observational studies • RCTs • Cohort (prospective and retrospective) • Population based registry studies Case-control studies will only be included if no other evidence is identified for a specified outcome.
Other inclusion **exclusion criteria**	Studies from low/middle income countries Only data which has been adjusted for relevant confounders (as identified by study authors) will be included in the review.

Field (based on PRISMA-P)	Content
Proposed stratified, sensitivity/**sub-group analysis**, or meta-regression	Stratified analysis, in case of heterogeneity: - studies at high risk of bias will be analysed separately to those at low risk of bias
Selection process – duplicate screening/selection/analysis	Duplicate screening/selection/analysis will be undertaken for this review on at least 10% of records. Included and excluded studies will be cross checked with the committee and with published systematic reviews when available.
Data management (software)	'GRADE' will be used to assess the quality of evidence for each outcome. STAR will be used for bibliographies/citations, study sifting, data extraction and quality assessment/ critical appraisal
Information sources – databases and dates	Sources to be searched: Medline, Medline In-Process, CCTR, CDSR, DARE, HTA and Embase. Limits (e.g. date, study design): Study design will be limited to Systematic Reviews, RCTs, Cohort studies, Case-control studies, Cross-sectional studies, and Population based registry studies. Standard animal/non-English language filters will be applied. Cut-off date: Due to the anticipated size of the evidence base a pragmatic approach will be taken. The databases will initially be searched for existing systematic reviews (with no cut-off date). If well conducted systematic reviews are identified (which can be used as a basis for this evidence review) then an appropriate cut-off date will be identified from these, and a search will be conducted for new evidence, published since these reviews. No supplementary search techniques will be used.
Identify if an update	Yes. The existing review question addressed short-term outcomes for women and infants – by considering planned caesarean birth to planned vaginal birth only. Relevant evidence included in the existing review will be considered against this protocol, and included if appropriate.
Author contacts	Developer: National Guideline Alliance NGA-enquiries@RCOG.ORG.UK
Highlight if amendment to previous protocol	The existing guideline only compares planned vaginal delivery to planned caesarean birth. Relevant studies will be assessed and included if relevant to this protocol.

Field (based on PRISMA-P)	Content
Search strategy – for one database	For details please see appendix B
Data collection process – forms/duplicate	A standardised evidence table format will be used, and published as appendix D (clinical evidence tables) or H (economic evidence tables)
Data items – define all variables to be collected	For details please see evidence tables in appendix D (clinical evidence tables) or H (economic evidence tables) of the full guideline.
Methods for assessing bias at outcome/study level	Appraisal of methodological quality: The methodological quality of each study will be assessed using an appropriate checklist: 1. Systematic review and Meta-analyses – ROBIS 2. RCTs: Cochrane RoB tool 3. Cohort studies: Newcastle Ottowa scale 4. Case-control studies (if required): CASP case control checklist For details please see section 6.2 of Developing NICE guidelines: the manual The risk of bias across all available evidence will evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/
Criteria for quantitative synthesis	For details please see section 6.4 of Developing NICE guidelines: the manual
Methods for quantitative analysis – combining studies and exploring (in)consistency	Synthesis of data: Meta-analysis will be conducted where appropriate using Review Manager. Minimum important differences: Any statistically significant difference will be considered as the MID for all outcomes. The importance of specific outcomes to an individual woman cannot be defined by the committee.
Meta-bias assessment – publication bias, selective reporting bias	For details please see section 6.2 of Developing NICE guidelines: the manual. Consider exploring publication bias for review questions where it may be more common, such as pharmacological questions, certain disease areas, etc. Describe any steps taken to mitigate against publication bias, such as examining trial registries.
Confidence in cumulative evidence	For details please see sections 6.4 and 9.1 of Developing NICE guidelines: the manual

Field (based on PRISMA-P)	Content
Rationale/context – what is known	For details please see the introduction to the evidence review in the full guideline.
Describe contributions of authors and guarantor	A multidisciplinary committee [add link to history page of the guideline] developed the guideline. The committee was convened by the NGA and chaired by Sarah Fishburn in line with section 3 of Developing NICE guidelines: the manual. Staff from the NGA undertook systematic literature searches, appraised the evidence, conducted meta-analysis and cost-effectiveness analysis where appropriate, and drafted the guideline in collaboration with the committee. For details please see the methods chapter of the full guideline.
Sources of funding/support	The NGA is funded by NICE and hosted by the Royal College of Obstetricians and Gynaecologists
Name of sponsor	The NGA is funded by NICE and hosted by the Royal College of Obstetricians and Gynaecologists
Roles of sponsor	NICE funds the NGA to develop guidelines for the NHS in England.
PROSPERO registration number	Not registered to PROSPERO

1 *CASP: critical appraisal skills programme; CCTR: Cochrane Controlled Register of Trials; CDSR: Cochrane database of systematic reviews; DARE: Database of Abstracts of*
2 *Reviews of Effects; GRADE: Grading of Recommendations, Assessmnet, Development and Evaluations; HTA: health technology assessment; NGA: National Guideline*
3 *Alliance; PROSPERO: The International Prospective Register of Systematic Reviews; RCT: randomised controlled trial; ROBIS: risk of bias in systematic reviews*

Appendix B – Literature search strategies

Literature search strategies for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

Review question search strategies

Databases: Medline; Medline EPub Ahead of Print; and Medline In-Process & Other Non-Indexed Citations

Date of last search: 01/08/2019

#	Searches
1	META-ANALYSIS/
2	META-ANALYSIS AS TOPIC/
3	(meta analy* or metanaly* or metaanaly*).ti,ab.
4	((systematic* or evidence*) adj2 (review* or overview*)).ti,ab.
5	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
6	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
7	(search* adj4 literature).ab.
8	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
9	cochrane.jw.
10	or/1-9
11	randomized controlled trial.pt.
12	controlled clinical trial.pt.
13	pragmatic clinical trial.pt.
14	randomi#ed.ab.
15	placebo.ab.
16	randomly.ab.
17	CLINICAL TRIALS AS TOPIC/
18	trial.ti.
19	or/11-18
20	COHORT STUDIES/
21	cohort?.ti,ab.
22	FOLLOW-UP STUDIES/
23	(Follow$ up adj3 (study or studies)).ti,ab.
24	LONGITUDINAL STUDIES/
25	longitudinal$.ti,ab.
26	PROSPECTIVE STUDIES/
27	prospective$.ti,ab.
28	RETROSPECTIVE STUDIES/
29	retrospective$.ti,ab.
30	OBSERVATIONAL STUDY/
31	observational$.ti,ab.
32	or/20-31
33	CASE-CONTROL STUDIES/
34	case control$.ti,ab.
35	or/33-34
36	REGISTRIES/
37	(registry or registries).ti,ab.
38	or/36-37
39	CROSS-SECTIONAL STUDIES/
40	cross sectional.ti,ab.
41	or/39-40
42	exp CESAREAN SECTION/
43	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).ti,ab.
44	or/42-43
45	LABOR, INDUCED/
46	(induc$ adj3 (labo?r$ or birth$ or born or deliver$)).ti,ab.
47	CERVICAL RIPENING/
48	(cervi$ adj3 ripen$).ti,ab.
49	exp EXTRACTION, OBSTETRICAL/
50	((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)).ti,ab.
51	(vacuum$ adj3 extract$).ti,ab.

#	Searches
52	ventouse?.ti,ab.
53	OBSTETRICAL FORCEPS/
54	forcep?.ti,ab.
55	(instrument$ adj3 deliver$).ti,ab.
56	NATURAL CHILDBIRTH/
57	((natural$ or unassisted or un-assisted) adj3 (birth$ or born or deliver$)).ti,ab.
58	(spontaneous$ adj3 (birth$ or born or deliver$)).ti,ab.
59	VAGINAL BIRTH AFTER CESAREAN/
60	((vagina$ or cephalic$) adj1 (birth$ or born or deliver$)).ti,ab.
61	VBAC.ti,ab.
62	or/45-61
63	*DELIVERY, OBSTETRIC/mt [Methods]
64	(mode? adj3 (birth? or deliver$)).ti,ab.
65	or/63-64
66	((maternal$ or mother$ or wom?n?) adj5 short$ adj5 term adj5 outcome?).ti,ab.
67	URINARY BLADDER/in [Injuries]
68	(bladder? adj3 injur$).ti,ab.
69	exp INTESTINE, LARGE/in [Injuries]
70	(bowel? adj3 injur$).ti,ab.
71	URETER/in [Injuries]
72	(ureter$ adj3 injur$).ti,ab.
73	HEMORRHAGE/
74	UTERINE HEMORRHAGE/
75	POSTPARTUM HEMORRHAGE/
76	((major or moderate$ or severe$) adj5 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
77	((postpartum or post-partum) adj3 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
78	((>1000ml or >1000 ml or >1000millilit$ or >1000 millilit$) adj3 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
79	MOTHERS/ and PATIENT SATISFACTION/
80	MOTHERS/ and "QUALITY OF LIFE"/
81	((maternal or mother?) adj5 satisf$).ti,ab.
82	"health related quality of life".ti,ab.
83	HRQOL?.ti,ab.
84	MATERNAL DEATH/
85	MATERNAL MORTALITY/
86	((maternal$ or mother?) adj5 (death? or mortalit$)).ti,ab.
87	PATIENT ADMISSION/ and exp INTENSIVE CARE UNITS/
88	((Intensive Therapy Unit? or ITU? or High Dependency Unit? or HDU? or Intensive care or ICU or PICU or NICU) adj5 admi$).ti,ab.
89	PERIPARTUM PERIOD/ and HYSTERECTOMY/
90	PERIPARTUM PERIOD/ and HYSTERECTOMY, VAGINAL/
91	((peripart$ or peri-part$) adj3 hysterectom$).ti,ab.
92	exp THROMBOSIS/
93	exp THROMBOEMBOLISM/
94	thrombo$.ti,ab.
95	((maternal$ or mother$ or wom?n?) adj5 long$ adj5 term adj5 outcome?).ti,ab.
96	PLACENTA ACCRETA/
97	PLACENTA/ab [Abnormalities]
98	placenta$ accreta.ti,ab.
99	(morbid$ adj3 adher$ adj3 placenta$).ti,ab.
100	(abnormal$ adj3 inva$ adj3 placenta$).ti,ab.
101	UTERINE RUPTURE/
102	(uter$ adj3 ruptur$).ti,ab.
103	STILLBIRTH/
104	stillbirth?.ti,ab.
105	ABORTION, SPONTANEOUS/
106	ABORTION, HABITUAL/
107	miscarr$.ti,ab.
108	(abort$ adj3 (spontaneous$ or habitual$)).ti,ab.
109	URINARY INCONTINENCE/
110	URINARY INCONTINENCE, STRESS/
111	((stress$ or mix$ or effort$ or urin$) adj3 incontinen$).ti,ab.
112	FECAL INCONTINENCE/
113	(f?ecal$ adj3 incontinen$).ti,ab.
114	DEPRESSION, POSTPARTUM/
115	(depress$ adj5 (postnatal$ or post-natal$ or postpartum or post-partum)).ti,ab.
116	PND.ti,ab.
117	STRESS DISORDERS, POST-TRAUMATIC/
118	((post-trauma$ or posttrauma$) adj3 stress$ adj3 disorder?).ti,ab.
119	PTSD.ti,ab.

#	Searches
120	((neonat$ or baby or babies or infant?) adj5 short$ adj5 term adj5 outcome?).ti,ab.
121	PERINATAL MORTALITY/
122	(perinatal$ adj5 (death? or mortalit$)).ti,ab.
123	((stillbirth or mortalit$) adj5 (one or "1" or two or "2" or three or "3" or four or "4" or five or "5" or six or "6" or seven or "7") adj3 day?).ti,ab.
124	PATIENT ADMISSION/ and INTENSIVE CARE UNITS, NEONATAL/
125	((baby or babies or neonat$) adj5 care unit? adj5 admi$).ti,ab.
126	(NICU adj5 admi$).ti,ab.
127	RESPIRATORY DISTRESS SYNDROME, NEWBORN/
128	(respirat$ adj3 distress$ adj3 (baby or babies or neonat$)).ti,ab.
129	(respirat$ adj3 morbidit$).ti,ab.
130	HYPOXIA-ISCHEMIA, BRAIN/
131	(hypoxi$ adj3 ischemi$ adj3 (encephalop$ or brain? or cerebral$)).ti,ab.
132	PERIPHERAL NERVE INJURY/
133	exp BRACHIAL PLEXUS/in [Injuries]
134	PHRENIC NERVE/in [Injuries]
135	FACIAL NERVE INJURIES/
136	(nerve? adj3 (injur$ or trauma$)).ti,ab.
137	(brachial plexus adj3 (injur$ or trauma$)).ti,ab.
138	exp INTRACRANIAL HEMORRHAGES/
139	((intracranial or brain or cerebral or subarachnoid) adj3 (h?emorrhag$ or bleed$)).ti,ab.
140	(extracranial adj3 (h?emorrhag$ or bleed$)).ti,ab.
141	(cranial adj3 (h?emorrhag$ or bleed$)).ti,ab.
142	exp INFANT, NEWBORN/ and INFECTION/
143	(infect$ adj3 morbidit$).ti,ab.
144	((baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 long$ adj5 term adj5 outcome?).ti,ab.
145	INFANT DEATH/
146	INFANT MORTALITY/
147	((infant? or neonat$ or baby or babies) adj5 (death? or mortalit$)).ti,ab.
148	CHILD MORTALITY/
149	(child$ adj5 (death? or mortalit$)).ti,ab.
150	CEREBRAL PALSY/
151	((cerebral or brain or central) adj3 (pals$ or paralys?s or pares?s)).ti,ab.
152	exp NEURODEVELOPMENTAL DISORDERS/
153	(neurodevelopment$ or neuro-development$).ti,ab.
154	((development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
155	(Asperger? or Kanner? or dyscalculi$ or acalculi$ or dyslexi$ or alexi$ or word blind$).ti,ab.
156	(PDD or PDD-NOS or DCD or SDDMF).ti,ab.
157	COGNITION DISORDERS/
158	(cognit$ adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
159	exp COMMUNICATION DISORDERS/
160	((speech or speak$ or language?) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
161	(Dysglossi$ or cluttering? or verbal fluency disorder? or Rhinolali$ or dyslali$ or aprosodi$ or Aphasi$ or Articulation Disorder? or Dysarthri$ or Echolali$ or mute or Mutism? or Stutter$ or Agraphi$ or Anomi$ or Dyslexi$ or Alexi$).ti,ab.
162	exp PSYCHOMOTOR DISORDERS/
163	((Psychomotor or psycho-motor) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
164	(Dyspraxi$ or apraxi$).ti,ab.
165	exp PSYCHOLOGICAL TESTS/ and (neurodevelopment$ or development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$).ti,ab.
166	exp PSYCHOMOTOR PERFORMANCE/ and (tool? or scale? or index$ or scor$ or system? or test$ or questionnaire? or survey$).ti,ab.
167	(assess$ adj5 (tool? or scale? or index$ or scor$ or system? or test$ or questionnaire? or survey$) adj10 (neurodevelopment$ or development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$)).ti,ab.
168	bayley$.ti,ab.
169	(mental$ adj3 development$ adj3 index$).ti,ab.
170	MDI.ti,ab.
171	((psychomotor or psycho-motor) adj3 development$ adj3 index$).ti,ab.
172	PDI.ti,ab.
173	(Ages and stages questionnaire?).ti,ab.
174	(Strengths and Difficulties Questionnaire?).ti,ab.
175	PEDIATRIC OBESITY/

#	Searches
176	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 (obes$ or overweight or over-weight)).ti,ab.
177	(ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and ASTHMA/
178	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 asthma$).ti,ab.
179	(ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and DIABETES MELLITUS, TYPE 1/
180	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 (type adj1 (one or "1") adj3 diabet$)).ti,ab.
181	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 T1D).ti,ab.
182	exp AUTISM SPECTRUM DISORDER/
183	(Asperger? or autis$ or Kanner?).ti,ab.
184	ASD.ti,ab.
185	or/66-184
186	DECISION MAKING/
187	DECISION SUPPORT TECHNIQUES/
188	decision?.ti,ab.
189	or/186-188
190	exp CESAREAN SECTION/ and (LABOR, INDUCED/ or CERVICAL RIPENING/ or exp EXTRACTION, OBSTETRICAL/ or OBSTETRICAL FORCEPS/ or NATURAL CHILDBIRTH/ or VAGINAL BIRTH AFTER CESAREAN/) and (MOTHERS/ or ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and (RISK/ or RISK FACTORS/)
191	DELIVERY, OBSTETRIC/mt and (MOTHERS/ or ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and (RISK/ or RISK FACTORS/)
192	((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj5 ((induc$ adj3 (labo?r$ or birth$ or born or deliver$)) or (cervi$ adj3 ripen$) or ((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)) or (vacuum$ adj3 extract$) or ventouse? or forcep? or (instrument$ adj3 deliver$) or ((natural$ or unassisted or un-assisted) adj3 (birth$ or born or deliver$)) or (spontaneous$ adj3 (birth$ or born or deliver$)) or ((vagina$ or cephalic$) adj1 (birth$ or born or deliver$)) or VBAC) adj5 (maternal$ or mother$ or wom?n? or neonat$ or baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 risk?).ti,ab.
193	(mode? adj3 (birth? or deliver$) adj5 (maternal$ or mother$ or wom?n? or neonat$ or baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 risk?).ti,ab.
194	or/190-193
195	((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj5 (subsequent$ or prior)).ti,ab.
196	(mode? adj3 (birth? or deliver$) adj5 (subsequent$ or prior)).ti,ab.
197	or/195-196
198	exp *CESAREAN SECTION/ and *POSTOPERATIVE COMPLICATIONS/
199	exp *CESAREAN SECTION/ae [Adverse Effects]
200	exp *CESAREAN SECTION/co [Complications]
201	44 and 62 and 185
202	65 and 185
203	44 and 62 and 189
204	65 and 189
205	194 or 197 or 198 or 199 or 200 or 201 or 202 or 203 or 204
206	limit 205 to english language
207	LETTER/
208	EDITORIAL/
209	NEWS/
210	exp HISTORICAL ARTICLE/
211	ANECDOTES AS TOPIC/
212	COMMENT/
213	CASE REPORT/
214	(letter or comment*).ti.
215	or/207-214
216	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
217	215 not 216
218	ANIMALS/ not HUMANS/
219	exp ANIMALS, LABORATORY/
220	exp ANIMAL EXPERIMENTATION/
221	exp MODELS, ANIMAL/
222	exp RODENTIA/
223	(rat or rats or mouse or mice).ti.
224	or/217-223
225	206 not 224
226	10 and 225
227	19 and 225
228	32 and 225
229	35 and 225
230	38 and 225
231	41 and 225

#	Searches
232	or/226-231

Databases: Embase; and Embase Classic

Date of last search: 01/08/2019

#	Searches
1	SYSTEMATIC REVIEW/
2	META-ANALYSIS/
3	(meta analy* or metanaly* or metaanaly*).ti,ab.
4	((systematic or evidence) adj2 (review* or overview*)).ti,ab.
5	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
6	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
7	(search* adj4 literature).ab.
8	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
9	((pool* or combined) adj2 (data or trials or studies or results)).ab.
10	cochrane.jw.
11	or/1-10
12	random*.ti,ab.
13	factorial*.ti,ab.
14	(crossover* or cross over*).ti,ab.
15	((doubl* or singl*) adj blind*).ti,ab.
16	(assign* or allocat* or volunteer* or placebo*).ti,ab.
17	CROSSOVER PROCEDURE/
18	SINGLE BLIND PROCEDURE/
19	RANDOMIZED CONTROLLED TRIAL/
20	DOUBLE BLIND PROCEDURE/
21	or/12-20
22	COHORT ANALYSIS/
23	cohort?.ti,ab.
24	FOLLOW UP/
25	(Follow$ up adj3 (study or studies)).ti,ab.
26	LONGITUDINAL STUDY/
27	longitudinal$.ti,ab.
28	PROSPECTIVE STUDY/
29	prospective$.ti,ab.
30	RETROSPECTIVE STUDY/
31	retrospective$.ti,ab.
32	OBSERVATIONAL STUDY/
33	observational$.ti,ab.
34	or/22-33
35	exp CASE CONTROL STUDY/
36	case control$.ti,ab.
37	or/35-36
38	REGISTER/
39	(registry or registries).ti,ab.
40	or/38-39
41	CROSS-SECTIONAL STUDY/
42	cross sectional.ti,ab.
43	or/41-42
44	exp CESAREAN SECTION/
45	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).ti,ab.
46	or/44-45
47	LABOR, INDUCTION/
48	(induc$ adj3 (labo?r$ or birth$ or born or deliver$)).ti,ab.
49	UTERINE CERVIX RIPENING/
50	(cervi$ adj3 ripen$).ti,ab.
51	VACUUM EXTRACTION/
52	((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)).ti,ab.
53	(vacuum$ adj3 extract$).ti,ab.
54	ventouse?.ti,ab.
55	FORCEPS DELIVERY/
56	OBSTETRIC FORCEPS/
57	forcep?.ti,ab.
58	(instrument$ adj3 deliver$).ti,ab.
59	NATURAL CHILDBIRTH/
60	((natural$ or unassisted or un-assisted) adj3 (birth$ or born or deliver$)).ti,ab.
61	(spontaneous$ adj3 (birth$ or born or deliver$)).ti,ab.
62	VAGINAL DELIVERY/

#	Searches
63	VAGINAL BIRTH AFTER CESAREAN/
64	((vagina$ or cephalic$) adj1 (birth$ or born or deliver$)).ti,ab.
65	VBAC.ti,ab.
66	or/47-65
67	(mode? adj3 (birth? or deliver$)).ti,ab.
68	((maternal$ or mother$ or wom?n?) adj5 short$ adj5 term adj5 outcome?).ti,ab.
69	URINARY TRACT INJURY/
70	BLADDER INJURY/
71	BLADDER RUPTURE/
72	(bladder? adj3 injur$).ti,ab.
73	INTESTINE INJURY/
74	(bowel? adj3 injur$).ti,ab.
75	URETER INJURY/
76	(ureter$ adj3 injur$).ti,ab.
77	OBSTETRIC HEMORRHAGE/
78	UTERUS BLEEDING/
79	POSTPARTUM HEMORRHAGE/
80	((major or moderate$ or severe$) adj5 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
81	((postpartum or post-partum) adj3 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
82	((>1000ml or >1000 ml or >1000millilit$ or >1000 millilit$) adj3 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
83	MOTHER/ and PATIENT SATISFACTION/
84	MOTHER/ and "QUALITY OF LIFE"/
85	((maternal or mother?) adj5 satisf$).ti,ab.
86	"health related quality of life".ti,ab.
87	HRQOL?.ti,ab.
88	MATERNAL DEATH/
89	MATERNAL MORTALITY/
90	((maternal$ or mother?) adj5 (death? or mortalit$)).ti,ab.
91	HOSPITAL ADMISSION/ and (INTENSIVE CARE UNIT/ or MEDICAL INTENSIVE CARE UNIT/ or SURGICAL INTENSIVE CARE UNIT/)
92	((Intensive Therapy Unit? or ITU? or High Dependency Unit? or HDU? or Intensive care or ICU or PICU or NICU) adj5 admi$).ti,ab.
93	HYSTERECTOMY/ and (peripart$ or peri-part$).ti,ab.
94	VAGINAL HYSTERECTOMY/ and (peripart$ or peri-part$).ti,ab.
95	((peripart$ or peri-part$) adj3 hysterectom$).ti,ab.
96	exp THROMBOSIS/
97	exp THROMBOEMBOLISM/
98	thrombo$.ti,ab.
99	((maternal$ or mother$ or wom?n?) adj5 long$ adj5 term adj5 outcome?).ti,ab.
100	PLACENTA ACCRETA/
101	placenta$ accreta.ti,ab.
102	(morbid$ adj3 adher$ adj3 placenta$).ti,ab.
103	(abnormal$ adj3 inva$ adj3 placenta$).ti,ab.
104	UTERUS RUPTURE/
105	(uter$ adj3 ruptur$).ti,ab.
106	STILLBIRTH/
107	stillbirth?.ti,ab.
108	SPONTANEOUS ABORTION/
109	RECURRENT ABORTION/
110	miscarr$.ti,ab.
111	(abort$ adj3 (spontaneous$ or habitual$)).ti,ab.
112	URINE INCONTINENCE/
113	STRESS INCONTINENCE/
114	((stress$ or mix$ or effort$ or urin$) adj3 incontinen$).ti,ab.
115	FECES INCONTINENCE/
116	(f?ecal$ adj3 incontinen$).ti,ab.
117	POSTNATAL DEPRESSION/
118	(depress$ adj5 (postnatal$ or post-natal$ or postpartum or post-partum)).ti,ab.
119	PND.ti,ab.
120	POSTTRAUMATIC STRESS DISORDER/
121	((post-trauma$ or posttrauma$) adj3 stress$ adj3 disorder?).ti,ab.
122	PTSD.ti,ab.
123	((neonat$ or baby or babies or infant?) adj5 short$ adj5 term adj5 outcome?).ti,ab.
124	exp PERINATAL MORTALITY/
125	(perinatal$ adj5 (death? or mortalit$)).ti,ab.
126	((stillbirth or mortalit$) adj5 (one or "1" or two or "2" or three or "3" or four or "4" or five or "5" or six or "6" or seven or "7") adj3 day?).ti,ab.
127	HOSPITAL ADMISSION/ and NEONATAL INTENSIVE CARE UNIT/
128	((baby or babies or neonat$) adj5 care unit? adj5 admi$).ti,ab.
129	(NICU adj5 admi$).ti,ab.

#	Searches
130	NEONATAL RESPIRATORY DISTRESS SYNDROME/
131	(respirat$ adj3 distress$ adj3 (baby or babies or neonat$)).ti,ab.
132	(respirat$ adj3 morbidit$).ti,ab.
133	HYPOXIC ISCHEMIC ENCEPHALOPATHY/
134	(hypoxi$ adj3 ischemi$ adj3 (encephalop$ or brain? or cerebral$)).ti,ab.
135	PERIPHERAL NERVE INJURY/
136	BRACHIAL PLEXUS INJURY/
137	PHRENIC NERVE/ and NERVE INJURY/
138	FACIAL NERVE INJURY/
139	(nerve? adj3 (injur$ or trauma$)).ti,ab.
140	(brachial plexus adj3 (injur$ or trauma$)).ti,ab.
141	exp BRAIN HEMORRHAGE/
142	((intracranial or brain or cerebral or subarachnoid) adj3 (h?emorrhag$ or bleed$)).ti,ab.
143	(extracranial adj3 (h?emorrhag$ or bleed$)).ti,ab.
144	(cranial adj3 (h?emorrhag$ or bleed$)).ti,ab.
145	NEWBORN INFECTION/
146	(infect$ adj3 morbidit$).ti,ab.
147	((baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 long$ adj5 term adj5 outcome?).ti,ab.
148	INFANT MORTALITY/
149	((infant? or neonat$ or baby or babies) adj5 (death? or mortalit$)).ti,ab.
150	CHILDHOOD MORTALITY/
151	exp CHILD DEATH/
152	(child$ adj5 (death? or mortalit$)).ti,ab.
153	CEREBRAL PALSY/
154	((cerebral or brain or central) adj3 (pals$ or paralys?s or pares?s)).ti,ab.
155	DEVELOPMENTAL DISORDER/
156	DEVELOPMENTAL DELAY/
157	(neurodevelopment$ or neuro-development$).ti,ab.
158	((development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
159	(Asperger? or Kanner? or dyscalculi$ or acalculi$ or dyslexi$ or alexi$ or word blind$).ti,ab.
160	(PDD or PDD-NOS or DCD or SDDMF).ti,ab.
161	COGNITIVE DEFECT/
162	(cognit$ adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
163	exp COMMUNICATION DISORDER/
164	((speech or speak$ or language?) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
165	(Dysglossi$ or cluttering? or verbal fluency disorder? or Rhinolali$ or dyslali$ or aprosodi$ or Aphasi$ or Articulation Disorder? or Dysarthri$ or Echolali$ or mute or Mutism? or Stutter$ or Agraphi$ or Anomi$ or Dyslexi$ or Alexi$).ti,ab.
166	exp PSYCHOMOTOR DISORDER/
167	((Psychomotor or psycho-motor) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
168	(Dyspraxi$ or apraxi$).ti,ab.
169	exp NEUROPSYCHOLOGICAL TEST/
170	PSYCHOLOGIC TEST/ and (neurodevelopment$ or development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$).ti,ab.
171	PSYCHOMOTOR PERFORMANCE/ and (tool? or scale? or index$ or scor$ or system? or test$ or questionnaire? or survey$).ti,ab.
172	(assess$ adj5 (tool? or scale? or index$ or scor$ or system? or test$ or questionnaire? or survey$) adj10 (neurodevelopment$ or development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$)).ti,ab.
173	bayley$.ti,ab.
174	(mental$ adj3 development$ adj3 index$).ti,ab.
175	MDI.ti,ab.
176	((psychomotor or psycho-motor) adj3 development$ adj3 index$).ti,ab.
177	PDI.ti,ab.
178	(Ages and stages questionnaire?).ti,ab.
179	(Strengths and Difficulties Questionnaire?).ti,ab.
180	CHILDHOOD OBESITY/
181	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 (obes$ or overweight or over-weight)).ti,ab.
182	(exp ADOLESCENT/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and exp ASTHMA/
183	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 asthma$).ti,ab.
184	(exp ADOLESCENT/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and INSULIN DEPENDENT DIABETES MELLITUS/

#	Searches
185	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 (type adj1 (one or "1") adj3 diabet$)).ti,ab.
186	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 T1D).ti,ab.
187	exp AUTISM/
188	(Asperger? or autis$ or Kanner?).ti,ab.
189	ASD.ti,ab.
190	or/68-189
191	exp DECISION MAKING/
192	DECISION SUPPORT SYSTEM/
193	decision?.ti,ab.
194	or/191-193
195	exp CESAREAN SECTION/ and (LABOR, INDUCTION/ or UTERINE CERVIX RIPENING/ or VACUUM EXTRACTION/ or FORCEPS DELIVERY/ or OBSTETRIC FORCEPS/ or NATURAL CHILDBIRTH/ or VAGINAL DELIVERY/ or VAGINAL BIRTH AFTER CESAREAN/) and (MOTHERS/ or exp ADOLESCENT/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and (RISK/ or RISK FACTOR/)
196	((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj5 ((induc$ adj3 (labo?r$ or birth$ or born or deliver$)) or (cervi$ adj3 ripen$) or ((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)) or (vacuum$ adj3 extract$) or ventouse? or forcep? or (instrument$ adj3 deliver$) or ((natural$ or unassisted or un-assisted) adj3 (birth$ or born or deliver$)) or (spontaneous$ adj3 (birth$ or born or deliver$)) or ((vagina$ or cephalic$) adj1 (birth$ or born or deliver$)) or VBAC) adj5 (maternal$ or mother$ or wom?n? or neonat$ or baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 risk?).ti,ab.
197	(mode? adj3 (birth? or deliver$) adj5 (maternal$ or mother$ or wom?n? or neonat$ or baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 risk?).ti,ab.
198	or/195-197
199	((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj5 (subsequent$ or prior)).ti,ab.
200	(mode? adj3 (birth? or deliver$) adj5 (subsequent$ or prior)).ti,ab.
201	or/199-200
202	exp CESAREAN SECTION/ and *POSTOPERATIVE COMPLICATION/
203	exp CESAREAN SECTION/co [Complication]
204	exp CESAREAN SECTION/ and ADVERSE OUTCOME/
205	46 and 66 and 190
206	67 and 190
207	46 and 66 and 194
208	67 and 194
209	198 or 201 or 202 or 203 or 204 or 205 or 206 or 207 or 208
210	limit 209 to english language
211	letter.pt. or LETTER/
212	note.pt.
213	editorial.pt.
214	CASE REPORT/ or CASE STUDY/
215	(letter or comment*).ti.
216	or/211-215
217	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
218	216 not 217
219	ANIMAL/ not HUMAN/
220	NONHUMAN/
221	exp ANIMAL EXPERIMENT/
222	exp EXPERIMENTAL ANIMAL/
223	ANIMAL MODEL/
224	exp RODENT/
225	(rat or rats or mouse or mice).ti.
226	or/218-225
227	210 not 226
228	11 and 227
229	21 and 227
230	34 and 227
231	37 and 227
232	40 and 227
233	43 and 227
234	or/228-233

Databases: Cochrane Central Register of Controlled Trials; and Cochrane Database of Systematic Reviews

Date of last search: 01/08/2019

#	Searches
#1	MeSH descriptor: [Cesarean Section] explode all trees
#2	(cesarean* or caesarean* or "c section*" or csection* or (deliver* near/3 abdom*)):ti,ab
#3	#1 or #2

#	Searches
#4	MeSH descriptor: [Labor, Induced] this term only
#5	(induc* near/3 (labor* or labour* or birth* or born or deliver*)):ti,ab
#6	MeSH descriptor: [Cervical Ripening] this term only
#7	(cervi* near/3 ripen*):ti,ab
#8	MeSH descriptor: [Extraction, Obstetrical] explode all trees
#9	((extract* or vacuum*) near/3 (birth* or born or deliver* or obstetric*)):ti,ab
#10	(vacuum* near/3 extract*):ti,ab
#11	ventouse*:ti,ab
#12	MeSH descriptor: [Obstetrical Forceps] this term only
#13	forcep*:ti,ab
#14	(instrument* near/3 deliver*):ti,ab
#15	MeSH descriptor: [Natural Childbirth] this term only
#16	((natural* or unassisted or un-assisted) near/3 (birth* or born or deliver*)):ti,ab
#17	(spontaneous* near/3 (birth* or born or deliver*)):ti,ab
#18	MeSH descriptor: [Vaginal Birth after Cesarean] this term only
#19	((vagina* or cephalic*) near/1 (birth* or born or deliver*)):ti,ab
#20	VBAC:ti,ab
#21	#4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20
#22	#3 and #21
#23	MeSH descriptor: [Delivery, Obstetric] this term only and with qualifier(s): [methods - MT]
#24	(mode* near/3 (birth* or deliver*)):ti,ab
#25	#22 or #23 or #24

Databases: Database of Abstracts of Reviews of Effects

Date of last search: 01/08/2019

#	Searches
1	MeSH DESCRIPTOR cesarean section EXPLODE ALL TREES IN DARE
2	((((cesarean* OR caesarean* OR "c section*" OR csection*)))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
3	((((deliver* NEAR3 abdom*)))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
4	#1 OR #2 OR #3
5	MeSH DESCRIPTOR labor, induced IN DARE
6	(((induc* NEAR3 (labor* or labour* or birth* or born or deliver*)))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
7	MeSH DESCRIPTOR cervical ripening IN DARE
8	(((cervi* NEAR3 ripen*))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
9	MeSH DESCRIPTOR extraction, obstetrical EXPLODE ALL TREES IN DARE
10	((((extract* or vacuum*) NEAR3 (birth* or born or deliver* or obstetric*)))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
11	(((vacuum* NEAR3 extract*))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
12	((ventouse*)) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
13	MeSH DESCRIPTOR obstetrical forceps IN DARE
14	((forcep*)) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
15	(((instrument* NEAR3 deliver*))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
16	MeSH DESCRIPTOR natural childbirth IN DARE
17	((((natural* or unassisted or un-assisted) NEAR3 (birth* or born or deliver*)))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
18	(((spontaneous* NEAR3 (birth* or born or deliver*)))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
19	MeSH DESCRIPTOR vaginal birth after cesarean IN DARE
20	((((vagina* or cephalic*) NEAR1 (birth* or born or deliver*)))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
21	((VBAC)) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
22	#5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21
23	#4 AND #22
24	MeSH DESCRIPTOR delivery, obstetric WITH QUALIFIER MT IN DARE
25	((((mode* NEAR3 (birth* OR deliver*))))) and ((Systematic review:ZDT and Bibliographic:ZPS) OR (Systematic review:ZDT and Abstract:ZPS))
26	#23 OR #24 OR #25

Databases: Health Technology Assessment

Date of last search: 01/08/2019

#	Searches
1	MeSH DESCRIPTOR cesarean section EXPLODE ALL TREES IN HTA
2	(((cesarean* OR caesarean* OR "c section*" OR csection*))) IN HTA
3	(((deliver* NEAR3 abdom*))) IN HTA
4	#1 OR #2 OR #3
5	MeSH DESCRIPTOR labor, induced IN HTA
6	((induc* NEAR3 (labor* or labour* or birth* or born or deliver*))) IN HTA
7	MeSH DESCRIPTOR cervical ripening IN HTA
8	((cervi* NEAR3 ripen*)) IN HTA
9	MeSH DESCRIPTOR extraction, obstetrical EXPLODE ALL TREES IN HTA
10	(((extract* or vacuum*) NEAR3 (birth* or born or deliver* or obstetric*))) IN HTA
11	((vacuum* NEAR3 extract*)) IN HTA
12	(ventouse*) IN HTA
13	MeSH DESCRIPTOR obstetrical forceps IN HTA
14	(forcep*) IN HTA
15	((instrument* NEAR3 deliver*)) IN HTA
16	MeSH DESCRIPTOR natural childbirth IN HTA
17	(((natural* or unassisted or un-assisted) NEAR3 (birth* or born or deliver*))) IN HTA
18	((spontaneous* NEAR3 (birth* or born or deliver*))) IN HTA
19	MeSH DESCRIPTOR vaginal birth after cesarean IN HTA
20	(((vagina* or cephalic*) NEAR1 (birth* or born or deliver*))) IN HTA
21	(VBAC) IN HTA
22	#5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21
23	#4 AND #22
	24 MeSH DESCRIPTOR delivery, obstetric WITH QUALIFIER MT IN HTA
	25 (((mode* NEAR3 (birth* OR deliver*)))) IN HTA
	26 #23 OR #24 OR #25

Health economics search strategies

Databases: Medline; Medline EPub Ahead of Print; and Medline In-Process & Other Non-Indexed Citations

Date of last search: 03/06/2019

#	Searches
1	ECONOMICS/
2	VALUE OF LIFE/
3	exp "COSTS AND COST ANALYSIS"/
4	exp ECONOMICS, HOSPITAL/
5	exp ECONOMICS, MEDICAL/
6	exp RESOURCE ALLOCATION/
7	ECONOMICS, NURSING/
8	ECONOMICS, PHARMACEUTICAL/
9	exp "FEES AND CHARGES"/
10	exp BUDGETS/
11	budget*.ti,ab.
12	cost*.ti,ab.
13	(economic* or pharmaco?economic*).ti,ab.
14	(price* or pricing*).ti,ab.
15	(financ* or fee or fees or expenditure* or saving*).ti,ab.
16	(value adj2 (money or monetary)).ti,ab.
17	resourc* allocat*.ti,ab.
18	(fund or funds or funding* or funded).ti,ab.
19	(ration or rations or rationing* or rationed).ti,ab.
20	ec.fs.
21	or/1-20
22	exp CESAREAN SECTION/
23	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).ti,ab.
24	or/22-23
25	*DELIVERY, OBSTETRIC/mt [Methods]
26	(mode? adj3 (birth? or deliver$)).ti,ab.
27	or/25-26
28	((maternal$ or mother$ or wom?n?) adj5 short$ adj5 term adj5 outcome?).ti,ab.
29	URINARY BLADDER/in [Injuries]
30	(bladder? adj3 injur$).ti,ab.
31	exp INTESTINE, LARGE/in [Injuries]

#	Searches
32	(bowel? adj3 injur$).ti,ab.
33	URETER/in [Injuries]
34	(ureter$ adj3 injur$).ti,ab.
35	HEMORRHAGE/
36	UTERINE HEMORRHAGE/
37	POSTPARTUM HEMORRHAGE/
38	((major or moderate$ or severe$) adj5 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
39	((postpartum or post-partum) adj3 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
40	((>1000ml or >1000 ml or >1000millilit$ or >1000 millilit$) adj3 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
41	MOTHERS/ and PATIENT SATISFACTION/
42	MOTHERS/ and "QUALITY OF LIFE"/
43	((maternal or mother?) adj5 satisf$).ti,ab.
44	"health related quality of life".ti,ab.
45	HRQOL?.ti,ab.
46	MATERNAL DEATH/
47	MATERNAL MORTALITY/
48	((maternal$ or mother?) adj5 (death? or mortalit$)).ti,ab.
49	PATIENT ADMISSION/ and exp INTENSIVE CARE UNITS/
50	((Intensive Therapy Unit? or ITU? or High Dependency Unit? or HDU? or Intensive care or ICU or PICU or NICU) adj5 admi$).ti,ab.
51	PERIPARTUM PERIOD/ and HYSTERECTOMY/
52	PERIPARTUM PERIOD/ and HYSTERECTOMY, VAGINAL/
53	((peripart$ or peri-part$) adj3 hysterectom$).ti,ab.
54	exp THROMBOSIS/
55	exp THROMBOEMBOLISM/
56	thrombo$.ti,ab.
57	((maternal$ or mother$ or wom?n?) adj5 long$ adj5 term adj5 outcome?).ti,ab.
58	PLACENTA ACCRETA/
59	PLACENTA/ab [Abnormalities]
60	placenta$ accreta.ti,ab.
61	(morbid$ adj3 adher$ adj3 placenta$).ti,ab.
62	(abnormal$ adj3 inva$ adj3 placenta$).ti,ab.
63	UTERINE RUPTURE/
64	(uter$ adj3 ruptur$).ti,ab.
65	STILLBIRTH/
66	stillbirth?.ti,ab.
67	ABORTION, SPONTANEOUS/
68	ABORTION, HABITUAL/
69	miscarr$.ti,ab.
70	(abort$ adj3 (spontaneous$ or habitual$)).ti,ab.
71	URINARY INCONTINENCE/
72	URINARY INCONTINENCE, STRESS/
73	((stress$ or mix$ or effort$ or urin$) adj3 incontinen$).ti,ab.
74	FECAL INCONTINENCE/
75	(f?ecal$ adj3 incontinen$).ti,ab.
76	DEPRESSION, POSTPARTUM/
77	(depress$ adj5 (postnatal$ or post-natal$ or postpartum or post-partum)).ti,ab.
78	PND.ti,ab.
79	STRESS DISORDERS, POST-TRAUMATIC/
80	((post-trauma$ or posttrauma$) adj3 stress$ adj3 disorder?).ti,ab.
81	PTSD.ti,ab.
82	((neonat$ or baby or babies or infant?) adj5 short$ adj5 term adj5 outcome?).ti,ab.
83	PERINATAL MORTALITY/
84	(perinatal$ adj5 (death? or mortalit$)).ti,ab.
85	((stillbirth or mortalit$) adj5 (one or "1" or two or "2" or three or "3" or four or "4" or five or "5" or six or "6" or seven or "7") adj3 day?).ti,ab.
86	PATIENT ADMISSION/ and INTENSIVE CARE UNITS, NEONATAL/
87	((baby or babies or neonat$) adj5 care unit? adj5 admi$).ti,ab.
88	(NICU adj5 admi$).ti,ab.
89	RESPIRATORY DISTRESS SYNDROME, NEWBORN/
90	(respirat$ adj3 distress$ adj3 (baby or babies or neonat$)).ti,ab.
91	(respirat$ adj3 morbidit$).ti,ab.
92	HYPOXIA-ISCHEMIA, BRAIN/
93	(hypoxi$ adj3 ischemi$ adj3 (encephalop$ or brain? or cerebral$)).ti,ab.
94	PERIPHERAL NERVE INJURY/
95	exp BRACHIAL PLEXUS/in [Injuries]
96	PHRENIC NERVE/in [Injuries]
97	FACIAL NERVE INJURIES/
98	(nerve? adj3 (injur$ or trauma$)).ti,ab.

#	Searches
99	(brachial plexus adj3 (injur$ or trauma$)).ti,ab.
100	exp INTRACRANIAL HEMORRHAGES/
101	((intracranial or brain or cerebral or subarachnoid) adj3 (h?emorrhag$ or bleed$)).ti,ab.
102	(extracranial adj3 (h?emorrhag$ or bleed$)).ti,ab.
103	(cranial adj3 (h?emorrhag$ or bleed$)).ti,ab.
104	exp INFANT, NEWBORN/ and INFECTION/
105	(infect$ adj3 morbidit$).ti,ab.
106	((baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 long$ adj5 term adj5 outcome?).ti,ab.
107	INFANT DEATH/
108	INFANT MORTALITY/
109	((infant? or neonat$ or baby or babies) adj5 (death? or mortalit$)).ti,ab.
110	CHILD MORTALITY/
111	(child$ adj5 (death? or mortalit$)).ti,ab.
112	CEREBRAL PALSY/
113	((cerebral or brain or central) adj3 (pals$ or paralys?s or pares?s)).ti,ab.
114	exp NEURODEVELOPMENTAL DISORDERS/
115	(neurodevelopment$ or neuro-development$).ti,ab.
116	((development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
117	(Asperger? or Kanner? or dyscalculi$ or acalculi$ or dyslexi$ or alexi$ or word blind$).ti,ab.
118	(PDD or PDD-NOS or DCD or SDDMF).ti,ab.
119	COGNITION DISORDERS/
120	(cognit$ adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
121	exp COMMUNICATION DISORDERS/
122	((speech or speak$ or language?) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
123	(Dysglossi$ or cluttering? or verbal fluency disorder? or Rhinolali$ or dyslali$ or aprosodi$ or Aphasi$ or Articulation Disorder? or Dysarthri$ or Echolali$ or mute or Mutism? or Stutter$ or Agraphi$ or Anomi$ or Dyslexi$ or Alexi$).ti,ab.
124	exp PSYCHOMOTOR DISORDERS/
125	((Psychomotor or psycho-motor) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
126	(Dyspraxi$ or apraxi$).ti,ab.
127	exp PSYCHOLOGICAL TESTS/ and (neurodevelopment$ or development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$).ti,ab.
128	exp PSYCHOMOTOR PERFORMANCE/ and (tool? or scale? or index$ or scor$ or system? or test$ or questionnaire? or survey$).ti,ab.
129	(assess$ adj5 (tool? or scale? or index$ or scor$ or system? or test$ or questionnaire? or survey$) adj10 (neurodevelopment$ or development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$)).ti,ab.
130	bayley$.ti,ab.
131	(mental$ adj3 development$ adj3 index$).ti,ab.
132	MDI.ti,ab.
133	((psychomotor or psycho-motor) adj3 development$ adj3 index$).ti,ab.
134	PDI.ti,ab.
135	(Ages and stages questionnaire?).ti,ab.
136	(Strengths and Difficulties Questionnaire?).ti,ab.
137	PEDIATRIC OBESITY/
138	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 (obes$ or overweight or over-weight)).ti,ab.
139	(ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and ASTHMA/
140	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 asthma$).ti,ab.
141	(ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and DIABETES MELLITUS, TYPE 1/
142	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 (type adj1 (one or "1") adj3 diabet$)).ti,ab.
143	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 T1D).ti,ab.
144	exp AUTISM SPECTRUM DISORDER/
145	(Asperger? or autis$ or Kanner?).ti,ab.
146	ASD.ti,ab.
147	or/28-146
148	DECISION MAKING/
149	DECISION SUPPORT TECHNIQUES/
150	decision?.ti,ab.
151	or/148-150

#	Searches
152	exp CESAREAN SECTION/ and (MOTHERS/ or ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and (RISK/ or RISK FACTORS/)
153	DELIVERY, OBSTETRIC/mt and (MOTHERS/ or ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and (RISK/ or RISK FACTORS/)
154	((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj5 (maternal$ or mother$ or wom?n? or neonat$ or baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 risk?).ti,ab.
155	(mode? adj3 (birth? or deliver$) adj5 (maternal$ or mother$ or wom?n? or neonat$ or baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 risk?).ti,ab.
156	or/152-155
157	((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj5 (subsequent$ or prior)).ti,ab.
158	(mode? adj3 (birth? or deliver$) adj5 (subsequent$ or prior)).ti,ab.
159	or/157-158
160	exp *CESAREAN SECTION/ and *POSTOPERATIVE COMPLICATIONS/
161	exp *CESAREAN SECTION/ae [Adverse Effects]
162	exp *CESAREAN SECTION/co [Complications]
163	(24 or 27) and 147
164	(24 or 27) and 151
165	156 or 159 or 160 or 161 or 162 or 163 or 164
166	limit 165 to english language
167	LETTER/
168	EDITORIAL/
169	NEWS/
170	exp HISTORICAL ARTICLE/
171	ANECDOTES AS TOPIC/
172	COMMENT/
173	CASE REPORT/
174	(letter or comment*).ti.
175	or/167-174
176	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
177	175 not 176
178	ANIMALS/ not HUMANS/
179	exp ANIMALS, LABORATORY/
180	exp ANIMAL EXPERIMENTATION/
181	exp MODELS, ANIMAL/
182	exp RODENTIA/
183	(rat or rats or mouse or mice).ti.
184	or/177-183
185	166 not 184
186	21 and 185

Databases: Embase; and Embase Classic

Date of last search: 03/06/2019

#	Searches
1	HEALTH ECONOMICS/
2	exp ECONOMIC EVALUATION/
3	exp HEALTH CARE COST/
4	exp FEE/
5	BUDGET/
6	FUNDING/
7	RESOURCE ALLOCATION/
8	budget*.ti,ab.
9	cost*.ti,ab.
10	(economic* or pharmaco?economic*).ti,ab.
11	(price* or pricing*).ti,ab.
12	(financ* or fee or fees or expenditure* or saving*).ti,ab.
13	(value adj2 (money or monetary)).ti,ab.
14	resourc* allocat*.ti,ab.
15	(fund or funds or funding* or funded).ti,ab.
16	(ration or rations or rationing* or rationed).ti,ab.
17	or/1-16
18	exp CESAREAN SECTION/
19	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).ti,ab.
20	or/18-19
21	(mode? adj3 (birth? or deliver$)).ti,ab.
22	((maternal$ or mother$ or wom?n?) adj5 short$ adj5 term adj5 outcome?).ti,ab.
23	URINARY TRACT INJURY/
24	BLADDER INJURY/
25	BLADDER RUPTURE/

#	Searches
26	(bladder? adj3 injur$).ti,ab.
27	INTESTINE INJURY/
28	(bowel? adj3 injur$).ti,ab.
29	URETER INJURY/
30	(ureter$ adj3 injur$).ti,ab.
31	OBSTETRIC HEMORRHAGE/
32	UTERUS BLEEDING/
33	POSTPARTUM HEMORRHAGE/
34	((major or moderate$ or severe$) adj5 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
35	((postpartum or post-partum) adj3 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
36	((>1000ml or >1000 ml or >1000millilit$ or >1000 millilit$) adj3 (h?emorrhag$ or (blood adj2 (loss or lose or losing)) or bleed$)).ti,ab.
37	MOTHER/ and PATIENT SATISFACTION/
38	MOTHER/ and "QUALITY OF LIFE"/
39	((maternal or mother?) adj5 satisf$).ti,ab.
40	"health related quality of life".ti,ab.
41	HRQOL?.ti,ab.
42	MATERNAL DEATH/
43	MATERNAL MORTALITY/
44	((maternal$ or mother?) adj5 (death? or mortalit$)).ti,ab.
45	HOSPITAL ADMISSION/ and (INTENSIVE CARE UNIT/ or MEDICAL INTENSIVE CARE UNIT/ or SURGICAL INTENSIVE CARE UNIT/)
46	((Intensive Therapy Unit? or ITU? or High Dependency Unit? or HDU? or Intensive care or ICU or PICU or NICU) adj5 admi$).ti,ab.
47	HYSTERECTOMY/ and (peripart$ or peri-part$).ti,ab.
48	VAGINAL HYSTERECTOMY/ and (peripart$ or peri-part$).ti,ab.
49	((peripart$ or peri-part$) adj3 hysterectom$).ti,ab.
50	exp THROMBOSIS/
51	exp THROMBOEMBOLISM/
52	thrombo$.ti,ab.
53	((maternal$ or mother$ or wom?n?) adj5 long$ adj5 term adj5 outcome?).ti,ab.
54	PLACENTA ACCRETA/
55	placenta$ accreta.ti,ab.
56	(morbid$ adj3 adher$ adj3 placenta$).ti,ab.
57	(abnormal$ adj3 inva$ adj3 placenta$).ti,ab.
58	UTERUS RUPTURE/
59	(uter$ adj3 ruptur$).ti,ab.
60	STILLBIRTH/
61	stillbirth?.ti,ab.
62	SPONTANEOUS ABORTION/
63	RECURRENT ABORTION/
64	miscarr$.ti,ab.
65	(abort$ adj3 (spontaneous$ or habitual$)).ti,ab.
66	URINE INCONTINENCE/
67	STRESS INCONTINENCE/
68	((stress$ or mix$ or effort$ or urin$) adj3 incontinen$).ti,ab.
69	FECES INCONTINENCE/
70	(f?ecal$ adj3 incontinen$).ti,ab.
71	POSTNATAL DEPRESSION/
72	(depress$ adj5 (postnatal$ or post-natal$ or postpartum or post-partum)).ti,ab.
73	PND.ti,ab.
74	POSTTRAUMATIC STRESS DISORDER/
75	((post-trauma$ or posttrauma$) adj3 stress$ adj3 disorder?).ti,ab.
76	PTSD.ti,ab.
77	((neonat$ or baby or babies or infant?) adj5 short$ adj5 term adj5 outcome?).ti,ab.
78	exp PERINATAL MORTALITY/
79	(perinatal$ adj5 (death? or mortalit$)).ti,ab.
80	((stillbirth or mortalit$) adj5 (one or "1" or two or "2" or three or "3" or four or "4" or five or "5" or six or "6" or seven or "7") adj3 day?).ti,ab.
81	HOSPITAL ADMISSION/ and NEONATAL INTENSIVE CARE UNIT/
82	((baby or babies or neonat$) adj5 care unit? adj5 admi$).ti,ab.
83	(NICU adj5 admi$).ti,ab.
84	NEONATAL RESPIRATORY DISTRESS SYNDROME/
85	(respirat$ adj3 distress$ adj3 (baby or babies or neonat$)).ti,ab.
86	(respirat$ adj3 morbidit$).ti,ab.
87	HYPOXIC ISCHEMIC ENCEPHALOPATHY/
88	(hypoxi$ adj3 ischemi$ adj3 (encephalop$ or brain? or cerebral$)).ti,ab.
89	PERIPHERAL NERVE INJURY/
90	BRACHIAL PLEXUS INJURY/
91	PHRENIC NERVE/ and NERVE INJURY/
92	FACIAL NERVE INJURY/

#	Searches
93	(nerve? adj3 (injur$ or trauma$)).ti,ab.
94	(brachial plexus adj3 (injur$ or trauma$)).ti,ab.
95	exp BRAIN HEMORRHAGE/
96	((intracranial or brain or cerebral or subarachnoid) adj3 (h?emorrhag$ or bleed$)).ti,ab.
97	(extracranial adj3 (h?emorrhag$ or bleed$)).ti,ab.
98	(cranial adj3 (h?emorrhag$ or bleed$)).ti,ab.
99	NEWBORN INFECTION/
100	(infect$ adj3 morbidit$).ti,ab.
101	((baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 long$ adj5 term adj5 outcome?).ti,ab.
102	INFANT MORTALITY/
103	((infant? or neonat$ or baby or babies) adj5 (death? or mortalit$)).ti,ab.
104	CHILDHOOD MORTALITY/
105	exp CHILD DEATH/
106	(child$ adj5 (death? or mortalit$)).ti,ab.
107	CEREBRAL PALSY/
108	((cerebral or brain or central) adj3 (pals$ or paralys?s or pares?s)).ti,ab.
109	DEVELOPMENTAL DISORDER/
110	DEVELOPMENTAL DELAY/
111	(neurodevelopment$ or neuro-development$).ti,ab.
112	((development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
113	(Asperger? or Kanner? or dyscalculi$ or acalculi$ or dyslexi$ or alexi$ or word blind$).ti,ab.
114	(PDD or PDD-NOS or DCD or SDDMF).ti,ab.
115	COGNITIVE DEFECT/
116	(cognit$ adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
117	exp COMMUNICATION DISORDER/
118	((speech or speak$ or language?) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
119	(Dysglossi$ or cluttering? or verbal fluency disorder? or Rhinolali$ or dyslali$ or aprosodi$ or Aphasi$ or Articulation Disorder? or Dysarthri$ or Echolali$ or mute or Mutism? or Stutter$ or Agraphi$ or Anomi$ or Dyslexi$ or Alexi$).ti,ab.
120	exp PSYCHOMOTOR DISORDER/
121	((Psychomotor or psycho-motor) adj3 (disab$ or disorder? or difficult$ or impair$ or delay$)).ti,ab.
122	(Dyspraxi$ or apraxi$).ti,ab.
123	exp NEUROPSYCHOLOGICAL TEST/
124	PSYCHOLOGIC TEST/ and (neurodevelopment$ or development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$).ti,ab.
125	PSYCHOMOTOR PERFORMANCE/ and (tool? or scale? or index$ or scor$ or system? or test$ or questionnaire? or survey$).ti,ab.
126	(assess$ adj5 (tool? or scale? or index$ or scor$ or system? or test$ or questionnaire? or survey$) adj10 (neurodevelopment$ or development$ or intellect$ or communicat$ or expressive$ or receptive$ or learning or academic$ or arith$ or numer$ or math$ or read$ or write or writing or litera$ or spell$ or motor skill? or motor function$ or coordination or co-ordination or hyperkinetic$ or hyper-kinetic$ or clumsy child$)).ti,ab.
127	bayley$.ti,ab.
128	(mental$ adj3 development$ adj3 index$).ti,ab.
129	MDI.ti,ab.
130	((psychomotor or psycho-motor) adj3 development$ adj3 index$).ti,ab.
131	PDI.ti,ab.
132	(Ages and stages questionnaire?).ti,ab.
133	(Strengths and Difficulties Questionnaire?).ti,ab.
134	CHILDHOOD OBESITY/
135	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 (obes$ or overweight or over-weight)).ti,ab.
136	(exp ADOLESCENT/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and exp ASTHMA/
137	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 asthma$).ti,ab.
138	(exp ADOLESCENT/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and INSULIN DEPENDENT DIABETES MELLITUS/
139	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 (type adj1 (one or "1") adj3 diabet$)).ti,ab.
140	((p?ediatric? or baby or babies or infan$ or toddler? or child$ or schoolchild$ or preadolescen$ or adolescen$ or teen? or prepubescent or pubescent or offspring) adj10 T1D).ti,ab.
141	exp AUTISM/
142	(Asperger? or autis$ or Kanner?).ti,ab.
143	ASD.ti,ab.
144	or/22-143
145	exp DECISION MAKING/
146	DECISION SUPPORT SYSTEM/

#	Searches
147	decision?.ti,ab.
148	or/145-147
149	exp CESAREAN SECTION/ and (MOTHERS/ or exp ADOLESCENT/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/) and (RISK/ or RISK FACTOR/)
150	((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj5 (maternal$ or mother$ or wom?n? or neonat$ or baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 risk?).ti,ab.
151	(mode? adj3 (birth? or deliver$) adj5 (maternal$ or mother$ or wom?n? or neonat$ or baby or babies or infant? or preschool$ or pre-school$ or child$ or adolescen$ or teenage$) adj5 risk?).ti,ab.
152	or/149-151
153	((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj5 (subsequent$ or prior)).ti,ab.
154	(mode? adj3 (birth? or deliver$) adj5 (subsequent$ or prior)).ti,ab.
155	or/153-154
156	exp CESAREAN SECTION/ and *POSTOPERATIVE COMPLICATION/
157	exp CESAREAN SECTION/co [Complication]
158	exp CESAREAN SECTION/ and ADVERSE OUTCOME/
159	(20 or 21) and 144
160	(20 or 21) and 148
161	152 or 155 or 156 or 157 or 158 or 159 or 160
162	limit 161 to english language
163	letter.pt. or LETTER/
164	note.pt.
165	editorial.pt.
166	CASE REPORT/ or CASE STUDY/
167	(letter or comment*).ti.
168	or/163-167
169	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
170	168 not 169
171	ANIMAL/ not HUMAN/
172	NONHUMAN/
173	exp ANIMAL EXPERIMENT/
174	exp EXPERIMENTAL ANIMAL/
175	ANIMAL MODEL/
176	exp RODENT/
177	(rat or rats or mouse or mice).ti.
178	or/170-177
179	162 not 178
180	17 and 179

Database: Cochrane Central Register of Controlled Trials

Date of last search: 03/06/2019

#	Searches
#1	MeSH descriptor: [Economics] this term only
#2	MeSH descriptor: [Value of Life] this term only
#3	MeSH descriptor: [Costs and Cost Analysis] explode all trees
#4	MeSH descriptor: [Economics, Hospital] explode all trees
#5	MeSH descriptor: [Economics, Medical] explode all trees
#6	MeSH descriptor: [Resource Allocation] explode all trees
#7	MeSH descriptor: [Economics, Nursing] this term only
#8	MeSH descriptor: [Economics, Pharmaceutical] this term only
#9	MeSH descriptor: [Fees and Charges] explode all trees
#10	MeSH descriptor: [Budgets] explode all trees
#11	budget*:ti,ab
#12	cost*:ti,ab
#13	(economic* or pharmaco?economic*):ti,ab
#14	(price* or pricing*):ti,ab
#15	(financ* or fee or fees or expenditure* or saving*):ti,ab
#16	(value near/2 (money or monetary)):ti,ab
#17	resourc* allocat*:ti,ab
#18	(fund or funds or funding* or funded):ti,ab
#19	(ration or rations or rationing* or rationed) .ti,ab.
#20	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19
#21	MeSH descriptor: [Cesarean Section] explode all trees
#22	(cesarean* or caesarean* or "c section*" or csection* or (deliver* near/3 abdom*)):ti,ab
#23	MeSH descriptor: [Delivery, Obstetric] explode all trees and with qualifier(s): [methods - MT]
#24	(mode* near/3 (birth* or deliver*)):ti,ab
#25	#21 or #22 or #23 or #24
#26	#20 and #25

Databases: NHS Economic Evaluation Database

Date of last search: 03/06/2019

#	Searches
1	MeSH DESCRIPTOR CESAREAN SECTION EXPLODE ALL TREES IN NHSEED
2	((cesarean* OR caesarean* OR "c section*" OR csection*)) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED
3	((deliver* NEAR3 abdom*)) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED
4	MeSH DESCRIPTOR DELIVERY, OBSTETRIC WITH QUALIFIER MT IN NHSEED
5	((mode* NEAR3 (birth* OR deliver*))) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED
6	#1 OR #2 OR #3 OR #4 OR #5

Databases: Health Technology Assessment

Date of last search: 03/06/2019

#	Searches
1	MeSH DESCRIPTOR CESAREAN SECTION EXPLODE ALL TREES IN HTA
2	((cesarean* OR caesarean* OR "c section*" OR csection*)) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
3	((deliver* NEAR3 abdom*)) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
4	MeSH DESCRIPTOR DELIVERY, OBSTETRIC WITH QUALIFIER MT IN HTA
5	((mode* NEAR3 (birth* OR deliver*))) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
6	#1 OR #2 OR #3 OR #4 OR #5

Appendix C – Clinical evidence study selection

Clinical evidence study selections for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

Figure 1: Study selection flow chart – short-term outcomes

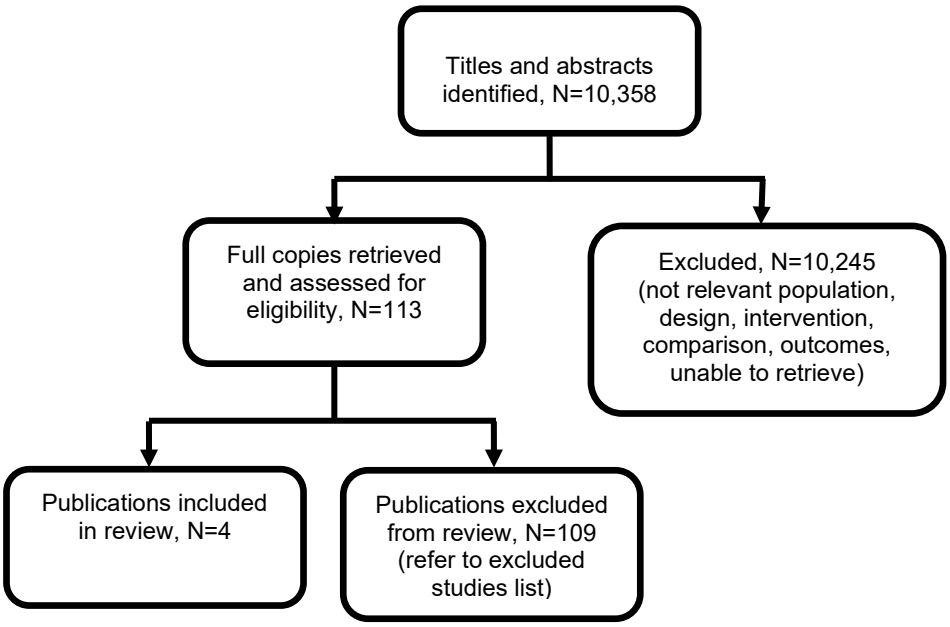
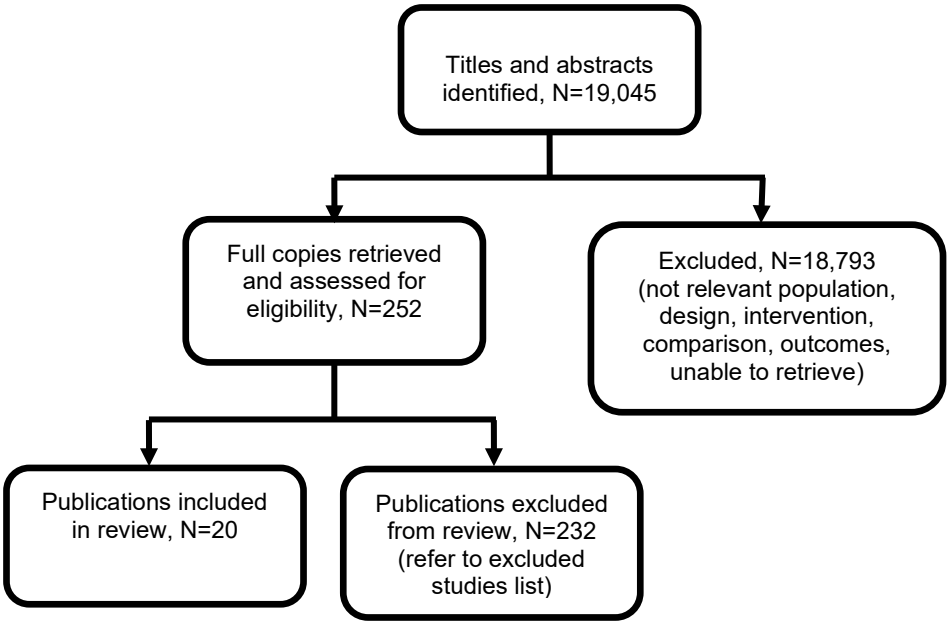


Figure 2: Study selection flow chart – long-term outcomes and systematic reviews



Appendix D – Clinical evidence tables

Clinical evidence tables for review question: What are the benefits and risks (short-and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

Table 5: Clinical evidence tables for benefits and risks of caesarean birth compared with planned vaginal birth – short term outcomes

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Full citation Herstad, Lina, Klungsoyr, Kari, Skjaerven, Rolv, Tanbo, Tom, Forsen, Lisa, Abyholm, Thomas, Vangen, Siri, Elective cesarean section or not? Maternal age and risk of adverse outcomes at term: a population-based registry study of low-risk primiparous women, BMC Pregnancy and Childbirth, 16, 230, 2016 **Ref Id** 1034530 **Country/ies where the study was carried out**	**Sample size** N= 6672 (n=373 in the elective caesarean birth group, n= 6299 in the operative vaginal birth group) **Characteristics** Not reported **Inclusion criteria** • Low-risk women with singleton pregnancies without registered medical indication for elective caesarean birth • Cephalic births • ≥35 years old **Exclusion criteria** • Women with missing values on the register • Women with one or more registered medical and pregnancy complications associated with elective caesarean birth	**Interventions** Elective caesarean birth versus planned unassisted vaginal birth	**Details** Data from the Medical Birth Registry of Norway (MBRN), linked to data from Statistics Norway was analysed. This registry has information on all birth from 16 weeks gestational age (week 12 since 2001). The study population were selected by excluding mothers with one or more registered medical and pregnancy complications	**Results** *Maternal short-term outcomes* Major obstetric haemorrhage (defined as >1500 ml of visually estimated blood loss within 24 hours postpartum) Elective caesarean birth: 8/373 (2.1%) Unassisted vaginal birth: 90/6299 (1.4%) Adjusted RR (95% CI): 1.63 (0.75 to 3.55) Intensive treatment unit admission	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies **Selection** 1) Representativeness of the exposed cohort: truly representative 2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Norway **Study type** Population-based retrospective registry study **Aim of the study** To assess the association between birth mode and adverse outcomes in women and their infants **Study dates** 1 January 1999 to 31 December 2009 **Source of funding** This work was undertaken when the main author was a PhD candidate at the Norwegian National Advisory Unit			associated with elective CS. This is because the MBRN contains information about maternal diseases and pregnancy complications, but not the indication for caesarean birth. Because there is no information about the caesarean births were planned in advance, results concerning this group have been reported according to actual mode of birth. Demographic data and birth details are registered prospectively using a standardised	Elective caesarean birth: 1/373 (0.3%) Unassisted vaginal birth: 7/6299 (0.1%) Adjusted RR (95% CI): 1.13 (0.12 to 11.05) *Infant short-term outcomes* Admission to neonatal unit Elective caesarean birth: 16/373 (4.3%) Unassisted vaginal birth: 282/6299 (4.5%) Adjusted RR (95% CI): 0.86 (0.50 to 1.46) Respiratory morbidity ("transitory tachypnea", "respiratory distress"; "meconium aspiration", "use	the design or analysis controlled for controlled for confounders: study controls for other factors (year of delivery, hospital size, gestational age and maternal age) **Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: complete follow-up - all subject accounted for **Overall quality:** good **Other information** Note that analyses used unassisted vaginal birth as the reference category; women were ≥35 years old. RR for unassisted vaginal birth were not reported

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
			form. Analyses used unassisted vaginal birth as the reference category; results were reported as risk ratios and adjusted for year of delivery, hospital size, gestational age and maternal age. Respiratory morbidity were identified by the tick boxes "transitory tachypnea", "respiratory distress"; "meconium aspiration", "use of respirator" and "continuous positive airway pressure". Blood loss was estimated visually.	of respirator", and "continuous positive airway pressure") Elective caesarean birth: 5/373 (1.3%) Unassisted vaginal birth: 82/6299 (1.3%) Adjusted RR (95% CI): 0.94 (0.36 to 2.46) Infectious morbidity Elective caesarean birth: 4/373 (1.1%) Unassisted vaginal birth: 154/6299 (2.4%) Adjusted RR: 0.43 (0.16 to .19)	

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr>
<td>Full citation
Karlstrom,A., Lindgren,H., Hildingsson,I., Maternal and infant outcome after caesarean section without recorded medical indication: findings from a Swedish case-control study, BJOG: An International Journal of Obstetrics and Gynaecology, 120, 479-486, 2013

Ref Id
272780

Country/ies where the study was carried out
Sweden

Study type
Retrospective case-control registry study

Aim of the study
To assess the complications in women who had a CS without medical indication</td>
<td>Sample size
N=19651 women included in total: n=5877 in the elective caesarean birth group and n=13774 in the spontaneous onset of labour group, with the intention of a vaginal birth (n=12936 in the actual vaginal birth group and n=838 in the emergency caesarean birth group).

N=18,813 women relevant for inclusion (n=12,936 in the spontaneous vaginal birth group and n=5,877 in the elective caesarean birth group).
All pregnancies were full term, singleton, with babies in vertex position.

Characteristics
<table>
<tr><th></th><th>Elective caesarean birth</th><th>Planned vaginal birth</th><th>P-value</th></tr>
<tr><td>Age <25 y/o</td><td>465 (7.9)</td><td>2467 (17.9)</td><td>NS</td></tr>
<tr><td>Age between 25 and 35 y/o</td><td>3599 (61.2)</td><td>9199 (66.8)</td><td>p<0.001</td></tr>
<tr><td>Age > 35 y/o</td><td>1813 (30.8)</td><td>2106 (15.3)</td><td>p<0.001</td></tr>
<tr><td>Primiparas</td><td>1405 (23.9)</td><td>7843 (56.9)</td><td>NS</td></tr>
<tr><td>Multiparas</td><td>4472 (76.1)</td><td>5931 (43.1)</td><td>p<0.001</td></tr>
<tr><td>BMI <20</td><td>421 (9.4)</td><td>1247 (11.3)</td><td>NS</td></tr>
<tr><td>BMI 20-25</td><td>2365 (52.9)</td><td>6429 (58.4)</td><td>NS</td></tr>
</table>
</td>
<td>Interventions
Elective CS without medical indication versus planned vaginal birth</td>
<td>Details
Birth records from women with elective caesarean birth were compared to those of women with planned vaginal birth.

Results were reported as adjusted odds ratio (OR), using the group of women with a planned and actual vaginal birth as the reference group (n=12936). Results were adjusted for age, parity, country of birth, body mass index, infertility and length of pregnancy.</td>
<td>Results
Maternal short-term outcomes

<u>Bleeding complications (definition was not reported)</u>

Elective caesarean birth: 579/5877 (9.9%)

Planned vaginal birth: 644/12936 (5%)

Adjusted OR (95% CI): 2.5 (2.1 to 3)

Infant short-term outcomes

<u>Respiratory morbidity</u>

Elective caesarean birth: 159/5877 (2.7%)

Planned vaginal birth: 132/12936 (1%)

Adjusted OR (95% CI): 2.7 (1.8 to 3.9)</td>
<td>Limitations
<u>Methodological limitations assessed using the CASP case-control checklist</u>

Section A: Are the results of the trial valid?
1. Did the study address a clearly focused issue? yes
2. Did the authors use an appropriate method to answer their question? yes
3. Were the cases accepted in an appropriate way? yes
4. Were the controls selected in an acceptable way? yes
5. Was the exposure accurately measured to minimise bias? yes
6a. Aside from the experimental intervention, were the groups treated equally? yes
6b. Have the authors taken account of the potential confounding factors in their design and/or analysis? Yes

Section B: What are the results?</td>
</tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
compared to women with a planned vaginal birth **Study dates** 1997 to 2006 **Source of funding** Supported by grants from the County Council of Vasternorrland, the Nothern County Councils of Swedenm, Mid Sweden University, Sundsvall, and Swedish Research Council	<table><tr><td>BMI 25-30</td><td>1165 (26)</td><td>2501 (22.7)</td><td>p<0.001</td></tr><tr><td>BMI 30-35</td><td>370 (8.3)</td><td>620 (5.6)</td><td>p<0.001</td></tr><tr><td>BMI >35</td><td>153 (3.4)</td><td>211 (1.9)</td><td>p<0.001</td></tr></table>NS= not significant **Inclusion criteria** • Birth records of women who planned a CS or a vaginal birth with singleton babies in the vertex position **Exclusion criteria** • Those whose labour was induced			<u>Infectious morbidity</u> Elective caesarean birth: 29/5877 (0.5%) Planned vaginal birth: 95/12936 (0.7%) Adjusted OR (95% CI): 0.7 (0.4 to 1)	7. How large was the treatment effect? treatment effect is large 8. How precise was the estimate of the treatment effect? estimates are not very precise as confidence intervals are wide, probably due to the low number of events 9. Do you believe the results? yes Section C: Will the results help locally? 10. Can the results be applied to the local population? yes 11. Do the results of this study fit with other available evidence? yes
Full citation Lavecchia, Melissa, Sabbah, Melanie, Abenhaim, Haim A., Effect of Planned Mode of Delivery in Women with Advanced Maternal Age, Maternal and child health journal, 20, 2318-2327, 2016	**Sample size** 442 067 (n= 35170 elective CS and n=406 897 planned vaginal birth) **Characteristics** <table><tr><td></td><td>Elective CS</td><td>Planned vaginal birth</td></tr><tr><td>Age between 35 and 39 y/o, n (%)</td><td>28136 (80)</td><td>341808 (84)</td></tr><tr><td>Age between 40 and 44 y/o, n (%)</td><td>6604 (18.78)</td><td>62096 (15.26)</td></tr></table>	**Interventions** Elective CS versus planned vaginal birth	**Details** Birth records from women with elective CS were compared to those of women with planned vaginal birth. Results were reported as	**Results** *Maternal short-term outcomes* <u>Postpartum haemorrhage (definition was not provided)</u> Adjusted OR (95% CI): 0.44 (0.39 to 0.48)	**Limitations** <u>Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies</u> **Selection** 1) Representativeness of the exposed cohort: truly representative

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Ref Id 740704 **Country/ies where the study was carried out** Canada **Study type** Population-based retrospective registry study **Aim of the study** To assess the complications in women who had a caesarean birth (CS) without medical indication compared to women with a planned vaginal birth **Study dates** 2003 to 2011 **Source of funding** Not reported	Age between 45 and 49, n (%) 402 (1.14) 2798 (0.69) Age 50+ 28 (0.08) 195 (0.05) **Inclusion criteria** • Healthy women who underwent planned caesarean birth or planned vaginal birth **Exclusion criteria** • Women with high risk pregnancies		adjusted OR and were adjusted for age, race, income, hospital type, hospital location and type of insurance. Because in the ICD-9 there is no code for elective primary caesarean birth, caesarean delivery in the absence of labour was used as a surrogate outcome for planned caesarean birth. ICD-9 codes were used to identify women who underwent labour or induction of labour. These women were	Maternal death Adjusted OR (95% CI): 5.63 (2.52 to 12.55) Peri-partum hysterectomy Adjusted OR (95% CI): 1.81 (1.36 to 2.40) Thromboembolic disease Adjusted OR (95% CI): 1.87 (0.84 to 4.18)	2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (maternal age, race, income, hospital type, hospital location and type of insurance) **Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: complete follow-up - all subject accounted for

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
			classified as having planned vaginal births.		**Overall quality:** good **Other information** Because in the ICD-9 there is no code for elective primary caesarean birth, caesarean delivery in the absence of labour was used as a surrogate outcome for planned Caesarean birth. Women were >35 years old
Full citation MacDorman,M.F., Declercq,E., Menacker,F., Malloy,M.H., Neonatal mortality for primary cesarean and vaginal births to low-risk women: application of an "intention-to-treat" model, Birth: Issues in Perinatal Care, 35, 3-8, 2008 **Ref Id** 51996 **Country/ies where the study was carried out**	**Sample size** N=7,409,247, n=271,179 with elective CS and n=7,138,068 with planned vaginal birth **Characteristics** Not reported **Inclusion criteria** • Records of women with: • No prior CS • Singleton • Vertex presentation • 37-41 weeks gestational age • No medical risk factors • No placenta previa **Exclusion criteria** • Records of women with no stated responses for birthweight, maternal education, and parity	**Interventions** Elective CS versus planned vaginal birth	**Details** The 1999 to 2002 birth cohort national linked birth and infant death data sets were analysed. Results were reported as ORs and adjusted for: maternal age, race/ ethnicity, education, parity, smoking, infant birthweight and gestational age.	**Results** *Infant short-term outcomes* Neonatal mortality (total neonatal mortality) Adjusted OR (95% CI): 2.34 (2.13 to 2.58)	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies **Selection** 1) Representativeness of the exposed cohort: truly representative 2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
US **Study type** Retrospective study **Aim of the study** To examine neonatal death by mode of delivery in low-risk women **Study dates** 1999 to 2002 **Source of funding** Not reported			Because the intention for mode of birth is not reported on birth certificated, those women with caesarean birth and no reported labour complications or procedures were analysed in the elective caesarean birth group. The planned vaginal birth group comprised women with vaginal births and women with caesarean birth with labour complications or procedures.		was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (maternal age, race/ ethnicity, education, parity, smoking, infant birthweight and gestational age) **Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: complete follow-up - all subject accounted for **Overall quality:** good

Table 6: Clinical evidence tables for benefits and risks of caesarean birth compared with planned vaginal birth - long-term outcomes

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Full citation Axelsson, Paul Bryde, Clausen, Tine Dalsgaard, Petersen, Anne Helby, Hageman, Ida, Pinborg, Anja, Kessing, Lars Vedel, Bergholt, Thomas, Rasmussen, Steen Christian, Keiding, Niels, Lokkegaard, Ellen Christine Leth, Relation Between Infant Microbiota and Autism?: Results from a National Cohort Sibling Design Study, Epidemiology (Cambridge, Mass.), 30, 52-60, 2019 **Ref Id** 1029480 **Country/ies where the study was carried out** Denmark **Study type**	**Sample size** N=616,977 (n= 63,240 in the caesarean birth group and n=553,737 in the vaginal birth group) **Characteristics** Not reported **Inclusion criteria** • Singleton children born to Danish parents and living in Denmark at their second birthday **Exclusion criteria** • Those who had died • Those already diagnosed with autism	**Interventions** Elective caesarean birth versus vaginal birth	**Details** Data was obtained from seven Danish nationwide registries. The outcome was time to first autism diagnosis (ICD-10). This included both outpatient and inpatient diagnoses, as well as primary and secondary discharge diagnoses. Children were followed-up up to 15 years. Results were reported as hazard ratio (HR) and adjusted for variables measured at the time of birth, namely: childhood antibiotic use; birth mode; maternal age	**Results** *Children long term outcomes* Autism spectrum disorder diagnosis (ICD-10) Adjusted HR (95% CI) 1.11 (1.03 to 1.20) Autism spectrum disorder diagnosis; sibling control analysis (ICD-10) Adjusted HR (95% CI) 0.97 (0.83 to 1.15)	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies **Selection** 1) Representativeness of the exposed cohort: truly representative 2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (childhood antibiotic use; birth mode; maternal age at birth; parental age

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Population-based prospective cohort study **Aim of the study** To assess the association between mode of birth and autism spectrum conditions **Study dates** 1st of January 1997 to 31st of December 2010 **Source of funding** Capital Region Denmark Research Fund, the Capital Region Denmark PhD-start Fund, the Nordsjaelland Hospital Hillerod Research Fund, the Jascha Fund, the Tvergarrds Fund, and the Gangsted Fund			at birth; parental age difference; parental education; maternal marital status; maternal smoking; infant sex; 5-minute Apgar score; use of CPAP or a ventilator; asphyxia; parental epilepsy; pre-eclampsia or hypertension; gestational diabetes; parity; maternal antibiotic use during pregnancy; maternal infections during pregnancy; paternal psychiatric history.		difference; parental education; maternal marital status; maternal smoking; infant sex; 5-minute Apgar score; use of CPAP or a ventilator; asphyxia; parental epilepsy; pre-eclampsia or hypertension; gestational diabetes; parity; maternal antibiotic use during pregnancy; maternal infections during pregnancy; paternal psychiatric history) **Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: complete follow-up - all subjects accounted for **Overall quality: good** **Other information**

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Unclear whether all children included were born at term</td></tr>
<tr><td>Full citation
Bahtiyar, Mert O., Julien, Svena, Robinson, Julian N., Lumey, Lambert, Zybert, Patricia, Copel, Joshua A., Lockwood, Charles J., Norwitz, Errol R., Prior cesarean delivery is not associated with an increased risk of stillbirth in a subsequent pregnancy: analysis of U.S. perinatal mortality data, 1995-1997, American Journal of Obstetrics and Gynecology, 195, 1373-8, 2006

Ref Id
1042602

Country/ies where the study was carried out
US

Study type</td><td>Sample size
N=9,287,701 (total n per group for term pregnancies was not reported)

Characteristics
The following characteristics include the whole population, including those who had pre-term births (N=11,061,599)<table><tr><td></td><td>Prior caesarean birth group</td><td>Prior vaginal birth group</td></tr><tr><td>Maternal age, mean years (SE)</td><td>30 (1.6)</td><td>27.4 (1.6)</td></tr><tr><td>Gestational age, mean weeks (SE)</td><td>39 (1.2)</td><td>39.4 (1.4)</td></tr></table>SE: standard error

Inclusion criteria
• Singleton term births
• Maternal age between 15 and 44 years old

Exclusion criteria
• Not reported</td><td>Interventions
Caesarean birth (any type) versus vaginal birth</td><td>Details
Data was obtained from the Centers for Disease Control and Prevention.

This is a linked birth and infant death dataset where information from birth certificates for each infant who dies in the US, Puerto Rico, the Virgin Islands and Guam is linked to their corresponding death certificate. The files contain information about demographics and birth characteristics.

Results were reported as</td><td>Results
Maternal long term outcomes

<u>Stillbirth in a subsequent pregnancy</u>
Adjusted RR (95% CI) 0.88 (0.83-0.94)</td><td>Limitations
<u>Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies</u>

Selection
1) Representativeness of the exposed cohort: truly representative (population based cohort)
2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort
3) Ascertainment of exposure: secure record
4) Demonstration that outcome of interest was not present at start of the study: yes

Comparability
1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study</td></tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Cross-sectional **Aim of the study** To assess the association between mode of birh and risk of stillbirth in a subsequent pregnancy **Study dates** 1st January 1995 to 31st December 1197 **Source of funding** Not reported			risk ratio (RR) and adjusted for maternal age, race, underlying medical conditions, and fetal congenital abnormalities		controls for other factors (diabetes mellitus, smoking, advanced maternal age, previous premature stillbirth, previous small for gestational age birth, previous neonatal death and previous stillbirth) **Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: no statement regarding missing data **Overall quality: good**
Full citation Black, Mairead, Bhattacharya, Siladitya, Philip, Sam, Norman, Jane E., McLernon, David J., Planned Cesarean Delivery at Term and Adverse Outcomes in Childhood	**Sample size** For infant mortality and type 1 diabetes outcomes, N=265,272 (n=12,355 in the elective CB group and n=252,917 in the vaginal birth group) For the obesity outcome, N= 51,568 (n= 2,682 in the elective CB group and n= 48,886 in the vaginal birth group) **Characteristics**	**Interventions** Planned caesarean birth versus vaginal birth	**Details** Births were identified retrospectively from the Scottish Morbidity Record (SMR02) database. All women meeting	**Results** *Children long term outcomes* Infant mortality (up to 1 year old) Planned caesarean birth: 26/12,355 Vaginal birth: 384/252,917	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies **Selection** 1) Representativeness of the exposed cohort: truly representative

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr>
<td>Health, JAMA, 314, 2271-9, 2015

Ref Id
1035532

Country/ies where the study was carried out
UK

Study type
Population based retrospective data-linkage study

Aim of the study
To assess the association between birth mode and infant mortality, type 1 diabetes, and obesity

Study dates
2015

Source of funding
The first author was funded by the Wellcome Trust as part of a personal research training fellowship</td>
<td>
<table>
<tr><th></th><th>Planned CB</th><th>VB</th><th>P-value</th></tr>
<tr><td>Maternal age, median years (IQR)</td><td>29 (25-33)</td><td>26 (21-30)</td><td>p<0.001</td></tr>
<tr><td>Maternal BMI, median (IQR)</td><td>24.8 (21.9-28.9)</td><td>23.9 (21.5-27.3)</td><td>p<0.001</td></tr>
<tr><td>Gestation, mean weeks (SD)</td><td>38.66 (1)</td><td>39.8 (1.21)</td><td>p<0.001</td></tr>
<tr><td>Maternal type 1 diabetes, n (%)</td><td>177 (1.4)</td><td>733 (0.3)</td><td>p<0.001</td></tr>
<tr><td>Male offspring, n (%)</td><td>5963 (48.3)</td><td>126991 (50.2)</td><td>p<0.001</td></tr>
<tr><td>Breastfeeding at age 6 weeks, n (%)</td><td>3055 (37.8)</td><td>54006 (34.6)</td><td>p<0.001</td></tr>
</table>
BMI: body mass index; IQR: interquartile range; SD: standard deviation

Inclusion criteria
• Primiparous women
• Term birth (≥37 weeks)
• Liveborn singleton births

Exclusion criteria
• Not reported
</td>
<td></td>
<td>inclusion criteria with liveborn births between January 1 1993 and December 31 2007 were included.

Using this record as the base population, 6 further national databases were record-linked.

Births were defined as planned caesarean birth for caesarean births recorded as "scheduled".

Results were reported as hazard ratio (HR) adjusted for pre-specified confounding factors: maternal age,</td>
<td>Adjusted HR (95% CI): 1.43 (0.95 to 2.16)

<u>Obesity at age 5</u>
Planned caesarean birth: 302/2,682

Vaginal birth: 4592/48,886

Adjusted HR (95% CI): 1.12 (0.99 to 1.26)

<u>Type 1 diabetes (up to 21 years old)</u>
Planned caesarean birth: 82/12,355

Vaginal birth: 1,260/252,917

Adjusted HR (95% CI): 1.20 (0.95 to 1.52)</td>
<td>2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort
3) Ascertainment of exposure: secure record
4) Demonstration that outcome of interest was not present at start of the study: yes

Comparability
1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (maternal age, maternal Carstais decile, maternal smoking status, estimated gestational age at birth, off-spring birth weight, offspring sex, year of birth, and breastfeeding status at 6 weeks. Maternal type 1 diabetes was adjusted for the models assessing type 1 diabetes and risk of obesity at age 5 was adjusted for maternal BMI)</td>
</tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
			maternal Carstais decile, maternal smoking status, estimated gestational age at birth, off-spring birth weight, offspring sex, year of birth, and breastfeeding status at 6 weeks. Maternal type 1 diabetes was adjusted for the models assessing type 1 diabetes and risk of obesity at age 5 was adjusted for maternal BMI.		**Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: complete follow-up - all subjects accounted for **Overall quality: good**
Full citation Clausen, Tine Dalsgaard, Bergholt, Thomas, Eriksson, Frank, Rasmussen, Steen, Keiding, Niels, Lokkegaard, Ellen C., Prelabor	**Sample size** N=1,620,401 (n=1,497,612 in the vaginal birth group and n=122,789 in the elective caesarean birth group) **Characteristics** Cesarean birth: Vaginal birth	**Interventions** Elective caesarean birth versus vaginal birth	**Details** Data was obtained from 4 Danish nationwide registers: the Medical Birth Registry, the Fertility	**Results** *Children long term outcomes* Type 1 diabetes up to age 15 Number of cases in the elective caesarean birth	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies **Selection**

Study details	Participants			Interventions	Methods	Outcomes and Results	Comments
Cesarean Section and Risk of Childhood Type 1 Diabetes: A Nationwide Register-based Cohort Study, Epidemiology (Cambridge, Mass.), 27, 547-55, 2016 **Ref Id** 1034264 **Country/ies where the study was carried out** Denmark **Study type** Population-based retrospective cohort study **Aim of the study** To assess the risk of type 1 diabetes with onset before 15 years of age by mode of birth **Study dates** 1982-2010 **Source of funding** Northzealands Hospital - Hillerød	Male offspring, n (%)	61,987 (50.4)	764,297 (51) GA< 34 weeks, n (%) 6,853 (5.5) 10,302 (0.6) GA 34 to 36 weeks, n (%) 9,931 (8) 40,686 (2.7) GA 37 to 40 weeks, n (%) 96,998 (78.9) 1,018,389 (68) GA> 40 weeks, n (%) 8,377 (6.8) 418,375 (27.9) Maternal type 1 diabetes, n (%) 1984 (1.7) 2565 (0.17) Paternal type 1 diabetes, n (%) 580 (0.4) 6613 (0.4) GA: gestational age **Inclusion criteria** • Not reported **Exclusion criteria** • Multiple pregnancies • Children with errors in their personal identification number		Database, the National Patient Registry, and the Register of Medicinal Product Statistics. Information regarding prescriptions on insulin or insulin analogues and oral anti-diabetics for the child, mother and father were obtained from the Register of Medicinal Product Statistics. Children were censored at time of death, or emigration, but otherwise were followed until they were diagnosed with type 1 diabetes, until their 15th	group: 293/ 122,789 Number of cases in the unassisted vaginal birth group: 3587/1,497,612 HR (95% CI) 1.1 (0.95 to 1.2)	1) Representativeness of the exposed cohort: truly representative (population based cohort) 2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (year of birth, maternal and paternal age at childbirth, maternal and paternal educational level, maternal and paternal type 1 diabetes diagnosed before childbirth) **Outcome**

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td>birthday or until 31st December 2012.

Results were reported as hazard ratio (HR) adjusted for year of birth, maternal and paternal age at childbirth, maternal and paternal educational level, maternal and paternal type 1 diabetes diagnosed before childbirth</td><td></td><td>1) Assessment of outcome: record linkage
2) Was follow-up long enough for outcomes to occur: yes
3) Adequacy of follow-up of cohorts: no statement regarding missing data

Overall quality: good

Other information
1% of the population gave birth before 34 weeks gestational age</td></tr>
<tr><td>Full citation
Curran, Eileen A., Dalman, Christina, Kearney, Patricia M., Kenny, Louise C., Cryan, John F., Dinan, Timothy G., Khashan, Ali S., Association Between Obstetric Mode of Delivery and Autism Spectrum Disorder:</td><td>Sample size
N= 2,325,453 (n=2,161,148 in the unassisted vaginal birth group and n=164,305 in the elective caesarean birth group)

Characteristics
<table><tr><th></th><th>Unassisted vaginal birth</th><th>Elective caesarean birth</th></tr><tr><td>Maternal age <20 y/o, n (%)</td><td>53 837 (2.5)</td><td>1722 (1.0)</td></tr></table></td><td>Interventions
Elective caesarean birth versus unassisted vaginal birth</td><td>Details
Data was collected from the Swedish Medical Birth Register, the Swedish National Patient Register, and the Swedish Multi-</td><td>Results
Children long term outcomes

<u>Autism spectrum condition (ICD-9 and ICD-10)</u>

Number of cases in the elective caesarean birth group: 2,035/164, 305</td><td>Limitations
<u>Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies</u>

Selection
1) Representativeness of the exposed cohort: truly representative</td></tr>
</table>

Study details	Participants			Interventions	Methods	Outcomes and Results	Comments
A Population-Based Sibling Design Study, JAMA psychiatry, 72, 935-42, 2015 **Ref Id** 1035644 **Country/ies where the study was carried out** Sweden **Study type** Population-based retrospective cohort study **Aim of the study** To assess the association between mode of birth and autism spectrum condition **Study dates** 1st January 1982 to 31st December 2010 **Source of funding** Irish Centre for Fetal and Neonatal Translational Research	Maternal age 20 to 29 y/o, n (%)	1 173 448 (54.3)	59 985 (36.5)		Generation Register. Children were followed-up until first diagnosis of ASD, death, migration, or 31st December 2011, whichever came first. Information on the diagnosis of autism spectrum condition was obtained from the Swedish National Patient Register. All pervasive developmental disorders were included as cases (in line with the DSM-5), including ICD-9 code 299, and ICD-10 code F84. Children in Sweden undergo a mandatory	Number of cases in the unassisted vaginal birth group: 21,757/2,161,148 HR (95% CI) 1.21 (1.15 to 1.27) <u>Autism spectrum condition; sibling control analysis (ICD-9 and ICD-10)</u> Number of cases in the elective caesarean birth group: 856 (total number of children in this analysis was not reported) Number of cases in the unassisted vaginal birth group: 10733 (total number of children in this analysis was not reported) Adjusted OR (95% CI) 0.89 (0.76 to 1.04)	2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (year of birth, infant gender, maternal age, gestational age, 5 minute Apgar score, maternal and paternal country of birth, small for gestational age, large for gestational age, first born, family income, maternal and paternal depression, bipolar disorder, and non-affective disorder) **Outcome**
	Maternal age 30 to 39 y/o, n (%)	889 416 (41.2)	92 648 (56.4)				
	Maternal age ≥40, n (%)	44 447 (2.1)	9950 (6.1)				
	Sex (male), n (%)	10 993 170 (50.6)	83 614 (50.9)				
	GA< 37 weeks, n (%)	81 132 (3.8)	21 804 (13.3)				
	GA=37 weeks, n (%)	98 600 (4.6)	16 793 (10.2)				
	GA=38 weeks, n (%)	251 075 (11.6)	78 142 (47.6)				
	GA=39 weeks, n (%)	529 513 (24.5)	32 201 (19.6)				
	GA=40 weeks, n (%)	658 128 (30.5)	7641 (4.7)				
	GA> 40 weeks, n (%)	539 049 (25.0)	7481 (4.6)				
	GA: gestational age, y/o: years old **Inclusion criteria** • Not reported **Exclusion criteria** • Multiple births • Those who died or emigrated before 1 year of age • Those with unknown mode of birth						

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
	• Those whose diagnosis was done before 1 year of age		developmental assessment at 4 years old, and children with suspected developmental disorders are referred for further assessment to a child psychiatry unit. This is standardised across Sweden. Results were reported as hazard ratio (HR) and adjusted for year of birth, infant sex, maternal age, gestational age, 5 minute Apgar score, maternal and paternal country of birth, small for gestational age, large for gestational age, first born, family income,		1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: complete follow-up - all subjects accounted for **Overall quality: good**

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td>maternal and paternal depression, bipolar disorder, and non-affective disorder.</td><td></td><td></td></tr>
<tr><td>Full citation
Curran, Eileen A., Cryan, John F., Kenny, Louise C., Dinan, Timothy G., Kearney, Patricia M., Khashan, Ali S., Obstetrical Mode of Delivery and Childhood Behavior and Psychological Development in a British Cohort, Journal of Autism and Developmental Disorders, 46, 603-14, 2016

Ref Id
1034282

Country/ies where the study was carried out
United Kingdom

Study type
Retrospective cohort study</td><td>Sample size
N=7367 (n=6317 in the spontaneous vaginal birth group and n=1050 in the caesarean birth group)

Characteristics
<table>
<tr><th></th><th>Planned caesarean birth</th><th>Spontaneous vaginal birth</th></tr>
<tr><td>Maternal age 14 to 19 y/o, n (%)</td><td>797 (9.06)</td><td>36 (2.48)</td></tr>
<tr><td>Maternal age 20 to 29 y/o, n (%)</td><td>4332 (49.26)</td><td>521 (35.91)</td></tr>
<tr><td>Maternal age 30 to 39 y/o, n (%)</td><td>3506 (39.86)</td><td>840 (57.89)</td></tr>
<tr><td>Maternal age 40+ y/o, n (%)</td><td>160 (1.82)</td><td>54 (3.72)</td></tr>
<tr><td>Gestational age 24 to 36 weeks, n (%), n (%)</td><td>493 (5.67)</td><td>88 (6.13)</td></tr>
<tr><td>Gestational age 37 weeks, n (%)</td><td>429 (4.93)</td><td>144 (10.03)</td></tr>
<tr><td>Gestational age 38 weeks, n (%)</td><td>1011 (11.620)</td><td>589 (41.02)</td></tr>
<tr><td>Gestational age 39 weeks, n (%)</td><td>2165 (24.88)</td><td>398 (27.72)</td></tr>
</table></td><td>Interventions
Elective caesarean birth versus spontaneous vaginal birth</td><td>Details
Data was obtained from the Millennium Cohort Study (MCS), which comprises a sample of children born in the UK between 2000 and 2002.

Data on mode of birth and potential confounders were obtained from the first survey.

Surveys were conducted when children were 5 and 7 years old, and respondents were asked if a doctor or a health</td><td>Results
Children long term outcomes

<u>Autism spectrum condition at 7 years of age</u>
Planned caesarean birth: 16/1050

Spontaneous vaginal birth: 93/6317

Adjusted OR (95% CI) 0.58 (0.19 to 1.79)</td><td>Limitations
<u>Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies</u>

Selection
1) Representativeness of the exposed cohort: truly representative
2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort
3) Ascertainment of exposure: written self-report
4) Demonstration that outcome of interest was not present at start of the study: yes

Comparability
1) Comparability of cohorts on the basis of the design or analysis controlled for</td></tr>
</table>

Study details	Participants			Interventions	Methods	Outcomes and Results	Comments
Aim of the study To assess the association between mode of birth and autism spectrum condition **Study dates** Between 2001 and 2008 **Source of funding** Science Foundation Ireland	Gestational age 40 weeks, n (%)	2971 (34.14)	136 (9.47) Gestational age 41+ weeks, n (%) 1633 (18.77) 123 (8.48) Male infant sex, n (%) 4442 (50.49) 712 (49.07) y/o: years old **Inclusion criteria** • Singleton births **Exclusion criteria** • Not reported		professional had ever told them their child had ASD. Results were reported as odds ratio (OR) adjusted for small for gestational age, gestational age, maternal high blood pressure/pre-eclampsia, maternal smoking during pregnancy, being the first born child, bleeding or threatened miscarriage during pregnancy, and infant age when he/she came home from the hospital, poverty, ethnicity, maternal age, maternal		controlled for confounders: study controls for other factors (parity, body mass index and age at first birth) **Outcome** 1) Assessment of outcome: self report 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: follow-up rate <80% Overall quality: fair **Other information** 7% of the population gave birth between 24 and 36 weeks

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
			education, urbanicity, single parent household at time of first survey, paternal age, and paternal education, maternal depression, maternal BMI, whether the pregnancy was a surprise, and maternal irritable bowel syndrome		
Full citation Franz, Maximilian B., Lack, Nicholas, Schiessl, Barbara, Mylonas, Ioannis, Friese, Klaus, Kainer, Franz, Stillbirth following previous cesarean section in Bavaria/Germany 1987-2005, Archives of Gynecology and Obstetrics, 279, 29-36, 2009 **Ref Id**	**Sample size** N= 629,815 (n=535,277 with previous vaginal birth and n= 94,538 with previous caesarean birth) **Characteristics** Not reported **Inclusion criteria** • Maternal age between 11 and 54 years old • Gestational age between 23 and 42 completed weeks **Exclusion criteria** • Multiple birth • Births due to congenital abnormalities	**Interventions** Any previous type of actual caesarean birth versus previous actual vaginal birth	**Details** Data were obtained from the Bavaria region database (98% complete). Risk of antepartum stillbirths due to all causes was compared using time-to-event analyses using gestation as time scale.	**Results** *Maternal long term outcomes* Stillbirth in a second pregnancy Adjusted HR (95% CI) 1.30 (0.93 to 1.81)	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies **Selection** 1) Representativeness of the exposed cohort: truly representative (population based cohort) 2) Selection of the non-exposed cohort: drawn from the same

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
1041632 **Country/ies where the study was carried out** Germany **Study type** Retrospective cohort **Aim of the study** To evaluate the risk of intrauterine death in second pregnancies after previous caesarean birth versus previous vaginal birth **Study dates** 1987-2005 **Source of funding** Not reported			Results were reported as hazard ratio (HR) adjusted for diabetes mellitus, smoking, advanced maternal age, previous premature stillbirth, previous small for gestational age birth, previous neonatal death and previous stillbirth.		community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (diabetes mellitus, smoking, advanced maternal age, previous premature stillbirth, previous small for gestational age birth, previous neonatal death and previous stillbirth) **Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: no

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>statement regarding missing data
Overall quality: good

Other information
Study included women who had any type of caesarean birth (emergency and elective)
Study included pre-term births. Study was not adjusted for gestational age</td></tr>
<tr><td>Full citation
Handa, V. L., Blomquist, J. L., Knoepp, L. R., Hoskey, K. A., McDermott, K. C., Munoz, A., Pelvic floor disorders 5-10 years after vaginal or cesarean childbirth, Obstetrics and Gynecology, 118, 777-784, 2011

Ref Id
690753

Country/ies where the study was carried out
US</td><td>Sample size
N= 643 (n= 192 caesarean births, n= 325 unassisted vaginal births, and n= 126 assisted vaginal births)

Characteristics
<table>
<tr><th></th><th>Elective caesarean birth</th><th>Unassisted vaginal birth</th><th>Assisted vaginal birth</th></tr>
<tr><td>Maternal age at enrolment, median years (range)</td><td>40 (36.1 to 43.6)</td><td>39.3 (35.7 to 42.8)</td><td>40.8 (36.6 to 43.4)</td></tr>
<tr><td>Years from first birth to enrolment, n (%)</td><td>7 (6.2 to 8.6)</td><td>7.5 (6.3 to 9.2)</td><td>7.5 (6.6 to 9.2)</td></tr>
</table></td><td>Interventions
Elective caesarean birth versus vaginal birth</td><td>Details
Women were identified from obstetric hospital discharge records using discharge diagnoses and potential participants were screened through a phone interview.

The presence of pelvic floor disorders was asseesed at the enrolllment visits. Women were screened</td><td>Results
Maternal long term outcomes

Stress urinary incontinence sym ptoms 5 to 10 years after birth (spontaneous vaginal birth versus elective caesarean birth)

Elective caesarean birth: 14/192

Spontaneous vaginal birth: 47/325</td><td>Limitations
Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies

Selection
1) Representativeness of the exposed cohort: somewhat representative (population based, but small sample size [i.e. under 1000 participants])
2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort</td></tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Study type Prospective cohort study **Aim of the study** To assess the risk of urinary and faecal incontinence by mode of birth **Study dates** Study recruitment started in 2008. Authors report that this is an ongoing study **Source of funding** Eunice Kennedy Shriver National Institute of Child Health and Human Development	<table><tr><td>Multiparous at enrolment, n (%)</td><td>131 (68)</td><td>249 (77)</td><td>90 (71)</td></tr><tr><td>BMI ≥30 kg/m2 at enrolment, n (%)</td><td>65 (34)</td><td>59 (18)</td><td>15 (12)</td></tr></table>BMI: body mass index **Inclusion criteria** • Those who gave birth to their first child 5 to 10 years before enrollment **Exclusion criteria** • Women <15 years old and >50 years old • Birth before 37 weeks gestational age • Placenta previa • Multiple birth • Known fetal congenital abnormality • Stillbirth • Prior myomectomy • Abruption • Note that women who developed the above symptoms during subsequent pregnancies were not excluded		using the Epidemiolog of Prolapse and Incontinence Questionaire, which is a validated self-administerd questionnaire. The tool produces a score and scores greater than a given threshold are used to distinguish women with pelvic floor disorders to those without. In addition to this questionnaire, a gynaecological examination is also performed using the Pelvic Organ Prolapse Quantification examination system. Women were also asked	Adjusted OR (95% CI) 2.87 (1.49 to 5.52)* *adjusted OR reported by the study with elective caesarean birth as the reference category. Based on the data provided, the NGA team inverted the ratios to have vaginal birth as the reference category. The reported OR (95% CI) for this outcome throughout the report is 0.34 (0.18 to 0.67) <u>Stress urinary incontinence symptoms 5 to 10 years after birth (elective versus assisted vaginal birth)</u> Elective caesarean birth: 14/192	3) Ascertainment of exposure: directly measured/ self-reported 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (African American ethnicity, maternal age > 35 years old, obesity, and multiparity) **Outcome** 1) Assessment of outcome: directly measured 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: they were able to contact 48.1% of women. No details of women who they were not able to contact have been reported

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
			about the presence of previous pelvic floor disorders diagnoses, currently therapy, current pessary use or medications to treat urinary incontinence. These women were considered to have a pelvic floor disorder regardless of current symptoms. Results were reported as odd ratio (OR) and adjusted for: African American ethnicity, maternal age > 35 years old, obesity, and multiparity.	Assisted vaginal birth: 25/126 Adjusted OR (95% CI) 4.45 (2.14 to 9.27)* *adjusted OR reported by the study with elective caesarean birth as the reference category. Based on the data provided, the NGA team inverted the ratios to have vaginal birth as the reference category. The reported OR (95% CI) for this outcome throughout the report is 0.22 (0.10 to 0.46) <u>Anal incontinence symptoms 5 to 10 years after birth (elective versus spontaneous vaginal birth)</u> Elective caesarean birth: 15/192	Overall quality: good

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
				Spontaneous vaginal birth: 37/325 Adjusted OR (95% CI) 1.62 (0.85 to 3.10)* *adjusted OR reported by the study with elective caesarean birth as the reference category. Based on the data provided, the NGA team inverted the ratios to have vaginal birth as the reference category. The reported OR (95% CI) for this outcome throughout the report is 0.61 (0.32 to 1.17) Anal incontinence symptoms 5 to 10 years after birth (elective versus assisted vaginal birth)	

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
				Elective caesarean birth: 15/192 Assisted vaginal birth: 19/126 Adjusted OR (95% CI) 2.22 (1.06 to 4.64)* *adjusted OR reported by the study with elective caesarean birth as the reference category. Based on the data provided, the NGA team inverted the ratios to have vaginal birth as the reference category. The reported OR (95% CI) for this outcome throughout the report is 0.45 (0.21 to 0.94)	
Full citation Hanrahan M, McCarthy FP, O'Keeffe GW, Khashan AS. The	**Sample size** N= 6866 (n= 846 in the planned caesarean birth group and n= 6020 in the vaginal birth group) **Characteristics**	**Interventions** Planned caesarean birth versus unassisted vaginal birth	**Details** Data was obtained from the Millenium Cohort Study,	**Results** *Children long term outcomes*	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
association between caesarean section and cognitive ability in childhood. Social psychiatry and psychiatric epidemiology. 2019 Oct 22:1-0. **Ref Id** 1029798 **Country/ies where the study was carried out** UK **Study type** Prospective cohort study **Aim of the study** To assess the association between mode of birth and cognitive ability **Study dates** Assessments were carried out between the years 2000 and 2002 **Source of funding** Not reported	<table><tr><td></td><td>Planned caesarean birth</td><td>Vaginal birth</td></tr><tr><td>Maternal age< 20 years old, n (%)</td><td>18 (2.1)</td><td>370 (601)</td></tr><tr><td>Maternal age 20 to 35 years old, n (%)</td><td>651 (77)</td><td>4897 (81.3)</td></tr><tr><td>Maternal age >36 years old, n (%)</td><td>177 (20.9)</td><td>753 (12.5)</td></tr><tr><td>Male offspring, n (%)</td><td>2877 (47.8)</td><td>396 (46.8)</td></tr><tr><td>Gestational age: very pre-term, n (%)</td><td>1 (0.1)</td><td>23 (0.4)</td></tr><tr><td>Gestational age: moderate to late pre-term, n (%)</td><td>135 (16)</td><td>561 (9.3)</td></tr><tr><td>Gestational age: term, n (%)</td><td>693 (81.9)</td><td>5205 (86.5)</td></tr><tr><td>Gestational age: post-term, n (%)</td><td>9 (1.1)</td><td>182 (3)</td></tr></table> **Inclusion criteria** • Not reported **Exclusion criteria** • Children for whom the main respondent to the assessment was not their biological mother • Multiple births • Incorrect coding for mode of birth		which is a longitudinal study of children born in the UK. Initially the study was designed to assess the association between gestational age and cognitive outcomes. Cognitive tests were carried out at 3,5, 7, and 11 years old. For the purpose of this study, assessments were grouped in Verbal Cognition tests (British Abilities Scale [BAS], Naming Vocabilar, BAS Word Reading and BAS Verbal Similarities); and Visual-	<u>Persistent verbal delay</u> Number of cases in the planned caesarean birth group: 19/846 Number of cases in the unassisted vaginal birth group: 131/6020 Adjusted OR (95% CI) 1.23 (0.74 to 2.04)	<u>assessment form for cohort studies</u> **Selection** 1) Representativeness of the exposed cohort: truly representative (population based cohort) 2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (gender, ethnicity, number of siblings, maternal age, maternal pre-pregnancy body mass index, maternal highest educational attainment, paternal

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
			Spatial Cognition tests (Cambridge Neuropsychological Test Automated Battery [CANTAB] Spatial Working Memory [SWM] Task and BAS Pattern Construction. Persistent delay was the term used to identify those who scored <1 SD below the mean score of the test at age 11 and in one of the earlier assessments. Results were reported as odds ratio (OR) adjusted for: gender, ethnicity, number of siblings, maternal age, maternal pre-pregnancy		highest educational attainment, maternal smoking during pregnancy, pre-eclampsia, index of multiple deprivation quintile) **Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: follow-up rate is 72%, no description of those lost **Overall quality: good** **Other information** 10.4% of births were pre-term

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td>body mass index, maternal highest educational attainment, paternal highest educational attainment, maternal smoking during pregnancy, pre-eclampsia, index of multiple deprivation quintile.</td><td></td><td></td></tr>
<tr><td>Full citation
Huang, Lisu, Chen, Qian, Zhao, Yanjun, Wang, Weiye, Fang, Fang, Bao, Yixiao, Is elective cesarean section associated with a higher risk of asthma? A meta-analysis, The Journal of asthma : official journal of the Association for the Care of Asthma, 52, 16-25, 2015</td><td>Sample size
K=8, N=2,782,769

Characteristics<table><tr><th>Study</th><th>Country</th><th>Population</th><th>Year of birth</th><th>Asthma diagnosis</th></tr><tr><td>Almqvist 2012</td><td>Sweden</td><td>87,500</td><td>1993 to 1999</td><td>National Patient Register (ICD code)</td></tr><tr><td>Braback 2013 17</td><td>Sweden</td><td>199,837</td><td>1999 to 2006</td><td>Swedish Prescriber Drug Register</td></tr></table></td><td>Interventions
Elective caesarean birth versus vaginal birth</td><td>Details
Search was conducted in PubMed, EMBASE, and MEDLINE from inception up to October 2013.

Abstracts were screened independently by 2 authors and data extraction was performed by 2 authors.</td><td>Results
Children long term outcomes

<u>Asthma</u>
Adjusted OR (95% CI) 1.21 (1.17 to 1.25)</td><td>Limitations
<u>Systematic review limitations assessed with the ROBIS checklist</u>

Identifying concerns in the review process
Domain 1: concerns regarding specification of study eligibility criteria: low
Domain 2: concerns regarding methods used to identify and/or select studies: low</td></tr>
</table>

Study details	Participants					Interventions	Methods	Outcomes and Results	Comments
Ref Id 1028588 **Country/ies where the study was carried out** China **Study type** Systematic review and meta-analysis **Aim of the study** To assess the association between mode of birth and risk of asthma **Study dates** Studies published between 2003 and 2013 **Source of funding** National Natural Science Foundation of China					(anti-asthmatic drugs)				Domain 3: concerns regarding methods used to collect data and appraise studies: low Domain 4: concerns regarding the synthesis and findings: low **Risk of bias in the review** A. Did the interpretation of findings address all of the concerns identified in Domains 1 to 4?: yes B. Was the relevance of identified studies to the review's research questions appropriately considered?: yes C. Did the reviewers avoid emphasizing results on the basis of their statistical significance?: yes **Risk of bias in the review:** LOW
	Hakansson 2003	Sweden	316,918	1984 to 1996	Hospital discharge records (ICD code)				
	Magnus 2011	Norway	37,171	1999 to 2008	Parental questionnaire (diagnosis)				
	Metsala 2008	Finland	22,584	1996 to 2004	Hospital admissions (ICD code)				
	Smith 2004	Scotland	241,846	1992 to 1995	Hospital admissions (ICD code)				
	Tollanes 2008	Norway	1,869,380	1967 to 1996	National Patient Register (ICD code)				
	Werner 2007	Denmark	7,119	1984 to 1987	Parental questionnaire (diagnosis)				
	ICD: International Classification of Diseases **Inclusion criteria** • Study should report an estimate for the relationship between mode of birth and asthma • It is original research • Study population should be children or both children and adults								

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td>Exclusion criteria
• Not reported</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Full citation
Keag, Oonagh E., Norman, Jane E., Stock, Sarah J., Long-term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: Systematic review and meta-analysis, PLoS Medicine, 15, e1002494, 2018

Ref Id
1028654

Country/ies where the study was carried out
UK

Study type
Systematic review and meta-analysis

Aim of the study
To assess the long terms risks of caesarean birth</td><td>Sample size
K=9, N=1,318,640

Characteristics
<table><tr><th>Study</th><th>Country</th><th>Years (data collection)</th><th>Population</th><th>Confounders adjusted for</th></tr><tr><td>Daltveit 2008</td><td>Norway</td><td>1967 to 2003</td><td>637,497</td><td>Adverse outcomes in previous pregnancy, maternal age, year of birth</td></tr><tr><td>Gray 2007</td><td>UK</td><td>1968 to 1989</td><td>81,707</td><td>Socioeconomic status, prepregnancy weight, maternal age, parity, smoking, previous adverse pregnancy outcome</td></tr><tr><td>Jackson 2012</td><td>Denmark</td><td>1994 to 2010</td><td>24,839</td><td>Maternal age, BMI, alcohol use, socioeconomic status</td></tr></table></td><td>Interventions
Caesarean birth (any type, including planned and emergency) versus vaginal birth</td><td>Details
Searches were conducted in Medline, Embase, Cochrane, and Cumulative Index to Nursing and Allied Health Literature (CINAHL) from inception up to May 2017. Abstracts were screened independently by 2 authors and data extraction was performed by 2 authors.
Included studies adjusted for various confounders, mainly maternal age, parity, BMI, and maternal complications in a previous</td><td>Results
Maternal long-term outcomes - Outcomes in any future pregnancy

Placenta accreta
OR (95% CI) 2.43 (1.74 to 3.40)

Uterine rupture
OR (95% CI) 25.81 (10.97 to 60.71)

Stillbirth
OR (95% CI) 1.27 (1.10 to 1.46)

The following studies reported on placenta acrreta: Daltveit 2008, Jackson 2012, Kennare 2007

The following studies reported on uterine rupture: Daltveit</td><td>Limitations
Systematic review limitations assessed with the ROBIS checklist
Identifying concerns in the review process
Domain 1: concerns regarding specification of study eligibility criteria: low
Domain 2: concerns regarding methods used to identify and/or select studies: unclear (the authors have specified inclusion and exclusion criteria, however a list of excluded studies has not been provided)
Domain 3: concerns regarding methods used to collect data and appraise studies: low
Domain 4: concerns regarding the synthesis and findings: low</td></tr>
</table>

Study details	Participants					Interventions	Methods	Outcomes and Results	Comments
Study dates Studies published before May 2017 (date where last search was done) **Source of funding** The authors report no direct funding. Two of the authors received support from Tommy's, which had no role in study design, data collection or data analysis	Kennare 2007	Australia	1998 to 2003	36,038	Age, indigenous status, smoking, pregnancy interval, medical complications such as hypertension/diabetes/asthma, obstetric complications, hospital category, patient type (public/private), gestation, history of ectopic/miscarriage/still birth/termination		pregnancy, such as hypertension, pre-term birth or diabetes For all included studies, there were pre-term births in the first pregnancy (% was not reported)	2008, Jackson 2012, Kennare 2007, Taylor 2005 The following studies reported on stillbirth in any future pregnancy: Gray 2007, Jackson 2012, Kennare 2007, Moraitis 2015, Ohana 2011, Osborne 2012, Richter 2007, Smith 2003, Taylor 2005, Wood 2008	**Risk of bias in the review** A. Did the interpretation of findings address all of the concerns identified in Domains 1 to 4?: yes B. Was the relevance of identified studies to the review's research questions appropriately considered?: yes C. Did the reviewers avoid emphasizing results on the basis of their statistical significance?: yes **Risk of bias in the review:** LOW **Other information** Note that this systematic review and meta-analysis included more outcomes than the ones reported in this evidence table. These have not been reported because included any type of caesarean birth.
	Moraitis	UK	1999 to 2008	128,585	Maternal age, height, smoking status, socio-economic deprivation				
	Osborne 2012	US	1994 to 2002	11,581	Multiple pregnancy, perinatal death secondary to congenital abnormality or rhesus isoimmunisation, delivery outside 24-43 weeks, birthweight <500g				
	Smith 2003	UK	1980 to 1998	103,790	Socioeconomic deprivation, smoking, maternal age, maternal height				

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
	<table><tr><td>Taylor 2005</td><td>Australia</td><td>1994 to 2002</td><td>136,101</td><td>Maternal age, prior uterine curettage, smoking in pregnancy, health insurance status, ethnicity, socio-economic group, pre-existing diabetes, gestational diabetes, pre-existing hypertension, PIH, labour, non-vertex presentation, gestational age, prelabor premature rupture of membranes, prior stillbirth, fetal sex, gestational age, SGA</td></tr><tr><td>Wood 2008</td><td>Canada</td><td>1991 to 2004</td><td>158,502</td><td>Maternal age, diabetes, hypertension, smoking, weight>91kg</td></tr></table> **Inclusion criteria** • RCTs • Large (> 1000 participants) observational studies with >1 year follow-up **Exclusion criteria** Not reported				
Full citation Khashan, Ali S., Kenny, Louise C., Lundholm, Cecilia, Kearney, Patricia M., Gong, Tong,	**Sample size** N= 2,253,979 (n=159,498 in the elective caesarean birth group and n= 2,094,481 in the unassisted vaginal birth group) **Characteristics**	**Interventions** Elective caesarean birth versus unassisted vaginal birth	**Details** Data was obtained from the Medical Birth Register.	**Results** *Children long term outcomes* Type 1 diabetes before age 15	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality

Study details	Participants			Interventions	Methods	Outcomes and Results	Comments
Almqvist, Catarina, Mode of obstetrical delivery and type 1 diabetes: a sibling design study, Pediatrics, 134, e806-13, 2014 **Ref Id** 1037200 **Country/ies where the study was carried out** Sweden **Study type** Population-based retrospective cohort study **Aim of the study** To assess the association between mode of birth and type 1 diabetes in children **Study dates** 1982-2009 **Source of funding** Stockholm County Council and Karolinska Institutet, the Swedish Research Council		Elective caesarean birth	Unassisted vaginal birth		The outcome was the presence of type 1 diabetes at 15 years of age, defined according ICD-8, 9 or 10. Results were reported as risk ratio (RR) adjusted for: small for gestational age, large for gestational age, gestational age, birth order, pre-eclampsia, infant sex, maternal age, BMI, pre-pregnancy diabetes, maternal education level, and gestational diabetes. The sibling analysis included siblings who	Adjusted RR (95% CI) 1.15 (1.06 to 1.25) Type 1 diabetes, sibling control analysis (n=2200 siblings) Adjusted RR (95% CI) 1.06 (0.85 to 1.31)	assessment form for cohort studies **Selection** 1) Representativeness of the exposed cohort: truly representative 2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: secure record 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (year of birth, infant gender, maternal age, gestational age, 5 minute Apgar score, maternal and paternal country of birth, small for gestational age, large for gestational age, first born, family
	Maternal age <20, n (%)	1743 (1.1)	53117 (2.5)				
	Maternal age 20 to 24, n (%)	16078 (10.1)	402946 (19.2)				
	Maternal age 25 to 29, n (%)	43229 (27.1)	742504 (35.4)				
	Maternal age 30 to 34, n (%)	24877 (34.4)	609694 (29.1)				
	Maternal age 35 to 39, n (%)	34180 (21.4)	244121 (11.7)				
	Maternal age 40+, n (%)	9375 (5.9)	42074 (2)				
	GA 22 to 32 weeks	7,074 (4.4)	8,631 (0.4)				
	GA 33 to 36 weeks	14,945 (9.4)	71,886 (3.4)				
	GA 37 to 38 weeks	91,778 (57.5)	339,172 (16.2)				
	GA 39 to 40 weeks	37,753 (23.7)	1,149,229 (54.9)				
	GA 41+ weeks	7,681 (4.8)	521,833 (24.9)				
	GA missing	267 (0.2)	3,730 (0.2)				
	BMI ≥30, n (%)	15205 (9.5)	104820 (5)				
	Pre-pregnancy diabetes, n (%)	3209 (2)	7232 (0.4)				
	Gestational diabetes , n (%)	2638 (1.7)	9531 (0.5)				

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
	<table><tr><td>Pre-eclampsia, n (%)</td><td>12182 (7.6)</td><td>12182 (7.6)</td></tr><tr><td>Male offspring, n (%)</td><td>81315 (50.1)</td><td>1059904 (50.6)</td></tr></table> **Inclusion criteria** • Singleton term live births born in Sweden between 1982 and 2009 **Exclusion criteria** • Multiple births • Stillbirths • Children with unknown mode of birth		were discordant for both mode of birth and type 1 diabetes.		income, maternal and paternal depression, bipolar disorder, and non-affective disorder) **Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: complete follow-up - all subjects accounted for **Overall quality: good** **Other information** 4.5% of women gave birth before 36 weeks gestational age. It was unclear the % of women who gave birth before 34 weeks gestational age. Results were adjusted for gestational age
Full citation MacArthur, C., Glazener, C., Lancashire, R., Herbison, P., Wilsond, D.,	**Sample size** N= 1976 (n=1852 in the spontaneous vaginal birth group and n=124 in the elective caesarean birth group) **Characteristics**	**Interventions** Elective caesarean birth versus spontaneous vaginal birth	**Details** The sample of women was obtained from all women who gave birth in 3	**Results** *Maternal long term outcomes* Urinary incontinence sym	**Limitations** Methodological limitations assessed using the Newcastle-Ottawa quality

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Exclusive caesarean section delivery and subsequent urinary and faecal incontinence: A 12-year longitudinal study, BJOG: An International Journal of Obstetrics and Gynaecology, 118, 1001-1007, 2011 **Ref Id** 430623 **Country/ies where the study was carried out** United Kingdom and New Zealand **Study type** Retrospective cohort study **Aim of the study** To assess whether birth mode history was predictive of incontinence at 12 years after the index birth **Study dates** 1993 and 1994	Not reported **Inclusion criteria** • Those who gave birth in 3 maternity units (2 in UK and 1 in NZ) **Exclusion criteria** • Not reported		maternity units in UK and NZ in the years 1993 and 1994. Women were initially contacted at 3 months postpartum to assess the prevalence of faecal and urinary incontinence. Women with urinary incontinence were eligible to take part in a randomised controlled trial to assess the effects of a floor muscle exercise programme on their symptoms. At 6 years, women who had responded were sent another questionnaire, and at 12 years, women were sent	ptoms 12 years after birth Elective caesarean birth: 48/124 Spontaneous vaginal birth: 1013/1852 Adjusted OR (95% CI) 0.43 (0.29 to 0.63) Faecal incontinence symptoms 12 years after birth Elective caesarean birth: 13/124 Spontaneous vaginal birth: 213/1852 Adjusted OR (95% CI) 0.82 (0.45 to 1.50)	assessment form for cohort studies **Selection** 1) Representativeness of the exposed cohort: truly representative 2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort 3) Ascertainment of exposure: written self-report 4) Demonstration that outcome of interest was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (parity, body mass index and age at first birth) **Outcome** 1) Assessment of outcome: self report 2) Was follow-up long enough for outcomes to occur: yes

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Source of funding Wellbeing on Women, Royal College of Obstetricians and Gynaecologists, Health Research Council of New Zealand			another one (women who had not responded at 6 years were still sent a questionnaire at 12 years, excepts for known deaths or those who requested not having a questionnaire sent at 6 years). In order to assess urinary incontinence, women were asked 'do you ever lose urine when you don't mean to', and if yes, 'in the last month, how often has this happened, on average?. In order to assess faecal incontinence, women were asked 'do you ever lose control of		3) Adequacy of follow-up of cohorts: follow-up rate <80% Overall quality: fair **Other information** Unclear whether women had pre-term birth

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
			bowel motions (stool/faeces) from your back passage in between visits to the toilet?'. At the time when the study was conducted, there were no suitable questionnaires to assess urinary and faecal incontinence. Women who answered 'no' to the main question but reported symptoms in subsidiary questions were recorded as being symptomatic. Results were reported as odds ratio (OR) adjusted for parity, body mass index and age at first birth. These		

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td>data was obtained from routine hospital case notes. Date and mode of delivery were obtained through the questionnaires</td><td></td><td></td></tr>
<tr><td>Full citation
Masukume, Gwinyai, McCarthy, Fergus P., Russell, Jin, Baker, Philip N., Kenny, Louise C., Morton, Susan Mb, Khashan, Ali S., Caesarean section delivery and childhood obesity: evidence from the growing up in New Zealand cohort, Journal of epidemiology and community health, 2019

Ref Id
1145798

Country/ies where the study was carried out
New Zealand

Study type</td><td>Sample size
N=5059 (n=4441 in the spontaneous vaginal birth and n=618 in the planned caesarean birth group)

Characteristics
<table><tr><th></th><th>Planned caesarean birth (n=618)</th><th>Spontaneous vaginal birth (n=4441)</th></tr><tr><td>Maternal age, median years (IQR)</td><td>34 (30 to 37)</td><td>30 (25 to 34)</td></tr><tr><td>Pre-pregnancy BMI, median (IQR)</td><td>24.2 (21.5 to 28.2)</td><td>23.8 (21.2 to 28.1)</td></tr><tr><td>Parity, mean (SD)</td><td>1.74 (0.44)</td><td>1.65 (0.48)</td></tr><tr><td>Male offspring, n (%)</td><td>332 (56.7)</td><td>2226 (50.1)</td></tr><tr><td>Gestational age <37 weeks, n (%)</td><td>33 (5.3)</td><td>168 (3.8)</td></tr></table></td><td>Interventions
Planned caesarean birth versus spontaneous vaginal birth</td><td>Details
Data was obtained from the Growing Up in New Zealand (GUiNZ) cohort. Mode of birth was extracted from perinatal records and children's height and weight was obtained at 24 and 54 months after birth by trained personnel from the study.

International Obesity Task Force criteria was used. Maternal pre-pregnancy</td><td>Results
Children long term outcomes

<u>Obesity at age 4.5 years</u>
Number of cases in the planned caesarean birth group: 38/618

Number of cases in the spontaneous vaginal birth group: 326/4441

Adjusted RRR (95% CI) 0.85 (0.56 to 1.29)</td><td>Limitations
<u>Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies</u>

Selection
1) Representativeness of the exposed cohort: somewhat representative (hospital based study)
2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort
3) Ascertainment of exposure: secure record
4) Demonstration that outcome of interest was not present at start of the study: yes

Comparability</td></tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Prospective cohort study **Aim of the study** To assess the association between mode of birth and childhood obesity using the Growing Up in New Zealand cohort **Study dates** 25th April 2009 to 25th March 2010 **Source of funding** The University of Auckland; the Ministry of Social Development; the Ministry of Health; the Ministry of Research, Science and Technology; the Health Research Council of New Zealand; the Ministry of Justice; the Families Commission; the Children's Commission; the Department of Labour; the Ministry of Education; Housing New	<table><tr><td>Gestational age 37 to 41 weeks, n (%)</td><td>581 (94)</td><td>4170 (93.9)</td></tr><tr><td>Gestational age >42 weeks, n (%)</td><td><10</td><td>101 (2.3)</td></tr></table> IQR: interquartile range, SD: standard deviation **Inclusion criteria** • Pregnant women with an estimated birth date between the study dates giving birth in 3 nominated hospitals in the North Island of New Zealand **Exclusion criteria** • Multiple births • Those with unknown mode of birth		BMI was calculated from self-reported weight and height. Results were reported as relative risk ratios (RRR) and were adjusted for the following factors: maternal age, education, marital status, infant sex, maternal smoking during pregnancy, pre-pregnancy BMI, gestational age at birth, birth weight, parity and diabetes mellitus.		1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: maternal age, education, marital status, infant sex, maternal smoking during pregnancy, pre-pregnancy BMI, gestational age at birth, birth weight, parity and diabetes mellitus) **Outcome** 1) Assessment of outcome: directly measured 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: Follow-up rate >97%. The study reports that those with missing outcome data were women who were significantly younger, less likely to have secondary school qualifications and less likely to have a relationshop with the bioological father at the time of pregnancy

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td>Zealand; Sport and Recreation New Zealand. The first author is also supported by the Irish Centre for Fetal and Neonatal Translational Research</td><td></td><td></td><td></td><td></td><td>Overall quality: good</td></tr>
<tr><td>Full citation
Masukume, G., McCarthy, F. P., Baker, P. N., Kenny, L. C., Morton, S. M. B., Murray, D. M., Hourihane, J. O., Khashan, A. S., Association between caesarean section delivery and obesity in childhood: A longitudinal cohort study in Ireland, BMJ Open, 9, e025051, 2019

Ref Id
1030049

Country/ies where the study was carried out
Ireland

Study type</td><td>Sample size
N=626 (n=156 elective cesarean birth and n=470 unassisted vaginal birth)

Characteristics<table><tr><th></th><th>Elective caesarean birth</th><th>Unassisted vaginal birth</th></tr><tr><td>Maternal age, median years (IQR)</td><td>32 (29.5-34)</td><td>30 (27-32)</td></tr><tr><td>Male offspring sex, n (%)</td><td>81 (5139)</td><td>221 (47)</td></tr><tr><td>Maternal BMI at 15 weeks (kg/m2), median (IQR), n (%)</td><td>24.9 (22.3-28.7)</td><td>23.9 (21.5-26.40</td></tr><tr><td>Gestational age, median weeks (IQR), n (%)</td><td>39.3 (38.6-40.1)</td><td>40.3 (39.3-41)</td></tr></table>BMI: body mass index, IQR: interquartile range

Inclusion criteria
• Low risk nulliparous women with singleton pregnancies</td><td>Interventions
Elective caesarean birth (prelabour lower segment caesarean section) versus unassisted vaginal birth</td><td>Details
Data were obtained from the Irish cohort of the prospective Screening for Pregnancy Endpoints (SCOPE) study and its follow-up prospective Irish birth cohort, the Babies after SCOPE: Evaluating the Longitudinal impact on Neurological and Nutritional Enspoints (BASELINE) study.

The child's height and</td><td>Results
Children long term outcomes

<u>Overweight or obese at age 5 years</u>

Number of cases in the elective caesarean birth group: 17/156

Number of cases in the vaginal birth group: 36/470

Adjusted RRR (95% CI)
1.37 (0.69 to 2.69)</td><td>Limitations
<u>Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies</u>

Selection
1) Representativeness of the exposed cohort: somewhat representative (population based, but small sample size [i.e. under 1000 participants])
2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort
3) Ascertainment of exposure: directly measured
4) Demonstration that outcome of interest</td></tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Prospective cohort study **Aim of the study** To examine the association between caesarean birth and obesity **Study dates** November 2007 and February 2011 **Source of funding** Health research board, National Children's Research Centre, Food Standards Agency of the United Kingdom, Irish Centre for Fetal and Neonatal Translational Research (INFANT)	**Exclusion criteria** • Women considered to be at high risk of fetal growth restriction, pre-eclampsia or spontaneous pre-term birth due to underlying medical conditions, previous cervical knife cone biopsy, ≥3 miscarriages, current ruptured membranes • Women with major uterine anomaly, a known major fetal anomaly or abnormal karyotype • Received an intervention that could modify pregnancy outcome		weight were measured by a trained interviewer using standardised protocols and approved instruments. BMI was classified according to the International Obesity Task Force (IOTF) criteria. Results were reported as relative risk ratios (RRR) and were adjusted for the following factors: maternal age, education, ethnicity, marital status, infant sex, maternal smoking during pregnancy, maternal BMI at the first antenatal visit,		was not present at start of the study: yes **Comparability** 1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (maternal age, education, ethnicity, marital status, infant sex, maternal smoking during pregnancy, maternal BMI at the first antenatal visit, gestational age at birth, birth weight and pre-eclampsia) **Outcome** 1) Assessment of outcome: directly measured 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: no statement regarding missing data **Overall quality: good**

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td>gestational age at birth, birth weight and pre-eclampsia.</td><td></td><td></td></tr>
<tr><td>Full citation
Masukume, Gwinyai, O'Neill, Sinead M., Baker, Philip N., Kenny, Louise C., Morton, Susan M. B., Khashan, Ali S., The Impact of Caesarean Section on the Risk of Childhood Overweight and Obesity: New Evidence from a Contemporary Cohort Study, Scientific reports, 8, 15113, 2018

Ref Id
1145799

Country/ies where the study was carried out
Ireland

Study type
Retrospective cohort study</td><td>Sample size
N=7981 (n=1402 in the elective caesarean birth group and n=6579 in the unassisted vaginal birth group)

Characteristics<table><tr><td></td><td>Elective caesarean birth</td><td>Unassisted vaginal birth</td></tr><tr><td>Age, median years (IQR)</td><td>35 (31-37)</td><td>32 (28-35)</td></tr><tr><td>Gestational age, mean weeks (SD)</td><td>38.7 (1.7)</td><td>39.7 (1.9)</td></tr><tr><td>Gestational diabetes, n (%)</td><td>61 (4.4)</td><td>151 (2.3)</td></tr><tr><td>Male offspring, n (%)</td><td>702 (50.1)</td><td>3253 (49.4)</td></tr><tr><td>Macrosomia (>4000g), n (%)</td><td>183 (13.1)</td><td>899 (13.7)</td></tr></table>IQR: interquartile range, SD: standard deviation

Inclusion criteria
• Not reported

Exclusion criteria
• Children whose primary caregivers were not their biological mothers</td><td>Interventions
Elective caesarean birth versus unassisted vaginal birth</td><td>Details
Data was obtained from the Growing Up in Ireland study. Infants were recruited randomly and families had face to face interviews when infants were approximately 9 months old.

Children were followed-up when they were 3 and 5 years old. Children's height and weight were measured using standard methods.

Obesity was defined according to the</td><td>Results
Children long term outcomes

<u>Obesity at age 5 years</u>
Number of cases in the elective caesarean birth group: 65/1402

Number of cases in the unassisted vaginal birth group: 252/6579

Adjusted RRR (95% CI) 1.30 (0.98 to 1.73)</td><td>Limitations
<u>Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies</u>

Selection
1) Representativeness of the exposed cohort: truly representative (population based cohort)
2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort
3) Ascertainment of exposure: structured interview
4) Demonstration that outcome of interest was not present at start of the study: yes

Comparability
1) Comparability of cohorts on the basis of the design or analysis controlled for</td></tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Aim of the study To assess the impact of caesarean birth on childhood obesity **Study dates** 1st December 2007 to 30th June 2008 **Source of funding** Government of Ireland	• Children born by vaginal breech birth • Those whose mode of birth was unknown		International Obesity Task Force (IOTF). Results were reported as relative risk ratio (RRR) adjusted for maternal age, education, ethnicity, marital status, region, infant sex, gestational age, pre-eclampsia, gestational diabetes, and parity.		controlled for confounders: study controls for other factors (maternal age, education, ethnicity, marital status, region, infant sex, gestational age, pre-eclampsia, gestational diabetes, and parity) **Outcome** 1) Assessment of outcome: independent blind assessment 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: response rate was 64% at baseline, 91% at 3 years, and 87% at 5 years. The study reports that children lost to follow-up tended to have unmarried mothers or mothers with lower educational attainment. **Overall quality: good**
Full citation Moshkovsky, R., Wainstock, T.,	**Sample size** N=131,880 (n= 11,780 elective caesarean birth and n=120,112 vaginal birth)	**Interventions** Elective caesarean birth	**Details** Data was obtained from	**Results** *Children long term outcomes*	**Limitations** Methodological limitations assessed

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr>
<td>Sheiner, E., Landau, D., Walfisch, A., Elective cesarean delivery at term and the long-term risk for endocrine and metabolic morbidity of the offspring, Journal of developmental origins of health and disease, 1-7, 2018

Ref Id
1031728

Country/ies where the study was carried out
Israel

Study type
Population-based retrospective cohort study

Aim of the study
To assess the association between mode of birth and offspring obesity

Study dates
1991 to 2014</td>
<td>Characteristics
<table>
<tr><th></th><th>Elective caesarean birth</th><th>Unassisted vaginal birth</th></tr>
<tr><td>Age at birth, mean (SD)</td><td>30.5 (5.5)</td><td>27.7 (5.6)</td></tr>
<tr><td>Gestational age at birth, mean (SD)</td><td>38.6 (1.3)</td><td>39.5 (1.2)</td></tr>
<tr><td>Macrosomia >4000, n (%)</td><td>1050 (8.9)</td><td>4829 (4)</td></tr>
<tr><td>Male offspring, n (%)</td><td>5917 (50.3)</td><td>59,683 (49.7)</td></tr>
</table>
SD: standard deviation

Inclusion criteria
• Term singleton births

Exclusion criteria
• Those with gestational diabetes, thyroid disease, gestational hypertension, chronic hypertension, premature rupture of membranes and Rh inmunization
• Instrumental births, cervical ripening, and labour induction
• Prolapse of cord, placental abruption or previa, non-progressive labour
• Congenital malformations, central nervous system malformations and chromosomal abnormalities</td>
<td>versus unassisted vaginal birth</td>
<td>the birth-record computerized database of the department od obstetrics and gynaecology, and the paediatric computerised-hospitalization database of the Soroka University Medical Center. Offspring obesity was defined as per the WHO, BMI percentile ≥97 %. Censoring occurred at time of a death or at age 18. Results were reported as hazard ratio (HR) adjusted for: maternal obesity (BMI ≥30 kg/m2), maternal age, gestational age, birth weight and maternal</td>
<td><u>Obesity</u>
Number of cases in the elective caesarean birth group: 15/11,768

Number of cases in the unassisted vaginal birth group: 149/120,112

Adjusted HR (95% CI) 1.35 (0.78 to 2.34)</td>
<td><u>using the Newcastle-Ottawa quality assessment form for cohort studies</u>

Selection
1) Representativeness of the exposed cohort: truly representative (population based cohort)
2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort
3) Ascertainment of exposure: secure record
4) Demonstration that outcome of interest was not present at start of the study: yes

Comparability
1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (maternal obesity (BMI ≥30 kg/m2), maternal age, gestational age, birth weight and maternal group B</td>
</tr>
</table>

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td>Source of funding
No specific grant or funding from any agency, commercial or non-profit organization</td><td></td><td></td><td>group B streptococcus colonization status</td><td></td><td>streptococcus colonization status)

Outcome
1) Assessment of outcome: record linkage
2) Was follow-up long enough for outcomes to occur: yes
3) Adequacy of follow-up of cohorts: no statement regarding missing data

Overall quality: good</td></tr>
<tr><td>Full citation
Petridou,E., Koussouri,M., Toupadaki,N., Papavassiliou,A., Youroukos,S., Katsarou,E., Trichopoulos,D., Risk factors for cerebral palsy: a case-control study in Greece, Scandinavian Journal of Social Medicine, 24, 14-26, 1996

Ref Id
322544</td><td>Sample size
N=357 (n=22 in the planned casesarean birth group, n= 271 in the spontaneous and vacuum birth group, n=11 in the forceps group, and n=53 in the emergency caesarean birth group)

Only those included in the planned caesarean birth group and in the spontaneous and vacuum birth group have been reported (N=293)

Characteristics
Characteristics based on the entire cohort of women and children (N=357)<table><tr><th></th><th>Cases</th><th>Control</th></tr><tr><td>Maternal age at birth <24 years old, n (%)</td><td>30 (29.1)</td><td>82 (32.3)</td></tr><tr><td>Maternal age at birth</td><td>33 (32)</td><td>99 (39)</td></tr></table></td><td>Interventions
Planned caesarean section versus spontaneous + vacuum vaginal birth</td><td>Details
Cases were ascertained from the PIKPA, National Welfare Organization, two non-governmental institutions dedicated to the care of children with cerebral palsy, and 3 major physiotherapy clinics specialised in the</td><td>Results
Children long term outcomes

<u>Cerebral palsy</u>
Number of cases in the planned caesarean birth group: 4/22

Number of cases in the spontaneous and vacuum birth group: 72/271

Adjusted OR (95% CI) 0.08 (0.01 to 0.65)</td><td>Limitations
<u>Methodological limitations assessed using the CASP case-control checklist</u>

Section A: Are the results of the trial valid?

1. Did the study address a clearly focused issue? yes

2. Did the authors use an appropriate method to answer their question? Yes</td></tr>
</table>

Study details	Participants			Interventions	Methods	Outcomes and Results	Comments
Country/ies where the study was carried out Greece **Study type** Case-control **Aim of the study** To assess the association between mode of birth and cerebral palsy **Study dates** 1991 and 1992 **Source of funding** Greek Ministry of Health and the Foundation for Research in Childhood	25 to 29 years old, n (%)				rehabilitation of people with cerebral palsy (no cerebral palsy registries were available at the time of the study). A neurologist confirmed the cerebral palsy diagnosis. Controls were chosen among neighbours of the index case or were healthy siblings of children with neurological diseases other than cerebral palsy, seen by the same neurologists as the children with cerebral palsy. Maternal characteristics were self-reported. Results were reported as odds ratio (OR) adjusted		3. Were the cases recruited in an appropriate way? can't tell, these were recruited from national organisations and physiotherapy practices, but not from national registries. Diagnosis was not based on a standardised criteria 4. Were the controls selected in an acceptable way? can't tell. Some of the controls were the siblings of the cases whereas others were siblings of children with a neurological condition different to cerebral palsy, therefore were not included in the study 5. Was the exposure accurately measured to minimise bias? no. Maternal characteristics were self-reported 6a. Aside from the experimental intervention, were the
	Maternal age at birth 30 to 34 years old, n (%)	21 (20.4)	46 (18.1)				
	Maternal age at birth 35+, n (%)	19 (18.5)	27 (10.6)				
	Female offspring, n (%)	46 (44.7)	116 (45.7)				
	Inclusion criteria • Children with an established diagnosis of cerebral palsy born in Athens between January 1st 1984 and December 31st 1988 **Exclusion criteria** • Not reported						

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
			for gender, age at interview, and maternal age at birth.		groups treated equally? Yes 6b. Have the authors taken account of the potential confounding factors in their design and/or analysis? Yes **Section B: What are the results?** 7. How large was the treatment effect? treatment effect is large, however results should be interpreted with caution considering the wide 95% CIs 8. How precise was the estimate of the treatment effect? estimates are not precise as confidence intervals are wide, probably due to the low number participants included 9. Do you believe the results? unclear **Section C: Will the results help locally**?

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>10. Can the results be applied to the local population? no, the study was based on a very small sample of children born on 4 consecutive years

11. Do the results of this study fit with other available evidence? can't tell (there is no other available evidence)

Other information
n=38 (10.6%) of children included were born before 32 weeks gestational age
n=27 (7.5%) were born between 33 and 36 weeks gestational age</td></tr>
<tr><td>Full citation
Xu, H., Ding, Y., Ma, Y., Xin, X., & Zhang, D. (2017). Cesarean section and risk of postpartum depression: a meta-analysis. Journal of psychosomatic research, 97, 118-126.</td><td>Sample size
K=6, N=13221

Characteristics<table><tr><td>Study</td><td>Country</td><td>Population</td><td>Mean age/age range</td><td>PPD diagnosis</td></tr><tr><td>Iwata 2015</td><td>Japan</td><td>419</td><td>37.7</td><td>EPDS ≥ 9</td></tr><tr><td>Barbadoro 2012</td><td>Italy</td><td>4984</td><td>-</td><td>Self-reported</td></tr></table></td><td>Interventions
Elective caesarean birth versus vaginal birth</td><td>Details
A systematic review up to November 2016 was conducted in PubMed, Web of Science and Embase. Studies were reviewed independently</td><td>Results
Maternal long term outcomes

<u>Post-partum depression</u>
Adjusted OR (95% CI) 1.15 (0.92 to 1.43), I2= 34.5%</td><td>Limitations
<u>Systematic review limitations assessed with the ROBIS checklist</u>

Identifying concerns in the review process

Domain 1: concerns regarding specification</td></tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
Ref Id 388619 **Country/ies where the study was carried out** China **Study type** Systematic review and meta-analysis **Aim of the study** To assess the association between mode of birth and postpartum depression **Study dates** Studies published between 2010 and 2015 **Source of funding** Study received no funding	<table><tr><td>Imsiragic 2014</td><td>Croatia</td><td>227</td><td>15-45</td><td>EPDS ≥ 9</td></tr><tr><td>Blom 2010</td><td>Netherlands</td><td>3386</td><td>29.7</td><td>EPDS ≥ 12</td></tr><tr><td>Rowlands 2012</td><td>UK</td><td>3905</td><td>≥16</td><td>Self-reported</td></tr><tr><td>Nikpour 2013</td><td>Iran</td><td>300</td><td>25.2</td><td>EPDS ≥ 13</td></tr></table>EPDS: Edinburgh Postnatal Depression Scale; PPD: postpartum depression **Inclusion criteria** • Observational studies published as original research • Studies were comparing caesarean birth with vaginal birth • The outcome of interest was post-partum depression • Multivariate adjusted odds ratio were reported with 95% confidence intervals **Exclusion criteria** • Not reported		by two researchers and discrepacienci es were discussed and resolved by a third investigator. If 2 studies reported on the same population, the one with the most recent completion data was included		of study eligibility criteria: low Domain 2: concerns regarding methods used to identify and/or select studies: low Domain 3: concerns regarding methods used to collect data and appraise studies: low Domain 4: concerns regarding the synthesis and findings: low **Risk of bias in the review** A. Did the interpretation of findings address all of the concerns identified in Domains 1 to 4?: yes B. Was the relevance of identified studies to the review's research questions appropriately considered?: yes C. Did the reviewers avoid emphasizing results on the basis of their statistical significance?: yes **Risk of bias in the review: LOW**
Full citation	**Sample size**	**Interventions**	**Details**	**Results**	**Limitations**

<table>
<tr><th>Study details</th><th>Participants</th><th>Interventions</th><th>Methods</th><th>Outcomes and Results</th><th>Comments</th></tr>
<tr>
<td>Yip, Benjamin Hon Kei, Leonard, Helen, Stock, Sarah, Stoltenberg, Camilla, Francis, Richard W., Gissler, Mika, Gross, Raz, Schendel, Diana, Sandin, Sven, Caesarean section and risk of autism across gestational age: a multi-national cohort study of 5 million births, International Journal of Epidemiology, 46, 429-439, 2017

Ref Id
1033936

Country/ies where the study was carried out
Norway, Sweden, Denmark, Finland, Australia

Study type
Population-based retrospective cohort study

Aim of the study</td>
<td>N= 4,559,493 (n= 243,749 in the planned caesarean birth group and n= 4,315,477 in the vaginal birth group)

Characteristics
<table>
<tr><th></th><th>Planned caesarean birth</th><th>Unassisted vaginal birth</th></tr>
<tr><td>Gestational age 26 to 36 weeks, n (%)</td><td>28,252 (11.6)</td><td>156,667 (3.6)</td></tr>
<tr><td>Gestational age 37 to 38 weeks, n (%)</td><td>108,434 (44.5)</td><td>666,512 (15.4)</td></tr>
<tr><td>Gestational age 39 to 41 weeks, n (%)</td><td>97,599 (40)</td><td>3,176,324 (73.6)</td></tr>
<tr><td>Gestational age 42 to 44 weeks, n (%)</td><td>9464 (3.9)</td><td>316,241 (6.5)</td></tr>
<tr><td>Male offspring, n (%)</td><td>126,614 (51.9)</td><td>2,201,829 (51)</td></tr>
</table>
Inclusion criteria
• Not reported

Exclusion criteria
• Multiple births</td>
<td>Planned caesarean birth versus unassisted vaginal birth</td>
<td>Data was obtained from population-based registries of Sweden, Norway, Denmark, Finland and Australia. Children were followed from birth to reported diagnosis of ASD or end of follow-up, whichever occurred first. ASD diagnoses from Denmark, Finland and Sweden were obtained from medical registries. ASD diagnoses from Norway and Austrlia were derived from government-maintained service/ benefits registries. Demographic</td>
<td>Children long term outcomes

<u>Autism spectrum condition</u>

Number of cases in the elective caesarean birth group: 1959/243,749

Number of cases in the unassisted vaginal birth group: 25750/4,315,744

Adjusted OR (95% CI) 1.26 (1.16 to 1.37)</td>
<td><u>Methodological limitations assessed using the Newcastle-Ottawa quality assessment form for cohort studies</u>

Selection
1) Representativeness of the exposed cohort: truly representative (population based cohort)
2) Selection of the non-exposed cohort: drawn from the same community as the exposed cohort
3) Ascertainment of exposure: secure record
4) Demonstration that outcome of interest was not present at start of the study: yes

Comparability
1) Comparability of cohorts on the basis of the design or analysis controlled for controlled for confounders: study controls for other factors (gestational age, site, maternal age and birth year)</td>
</tr>
</table>

Study details	Participants	Interventions	Methods	Outcomes and Results	Comments
To assess the association between mode of birth and autism spectrum condition **Study dates** Between 1984 and 2004 **Source of funding** Austism Speaks, Seaver Foundation, National Institutes of Health, Eunice Kennedy Shriver National Institute of Child Health and Human Development, the National Institute of Environmental Health Sciences, the National Institute of Neurological Disorders and Stroke			details were obtained from birth or civil registries. Results were reported in odd ratio (OR) adjusted for gestational age, site, maternal age and birth year.		**Outcome** 1) Assessment of outcome: record linkage 2) Was follow-up long enough for outcomes to occur: yes 3) Adequacy of follow-up of cohorts: no statement regarding missing data Overall quality: good

Appendix E – Forest plots

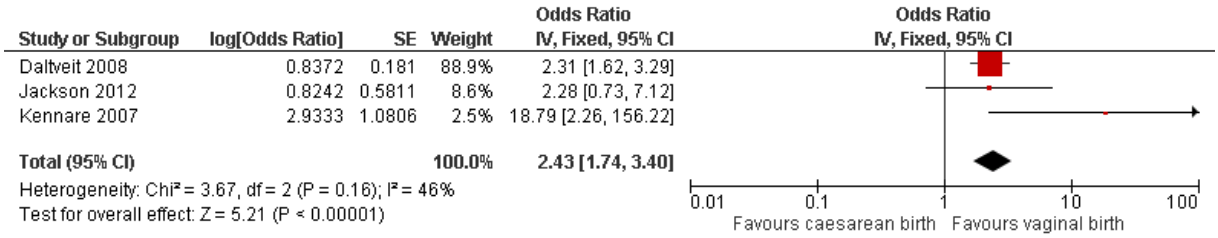
Forest plots for review question: What are the benefits and risks (short and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

This section includes forest plots only for outcomes that are meta-analysed. Outcomes from single studies are not presented here, but the quality assessment for these outcomes is provided in the GRADE profiles in appendix F.

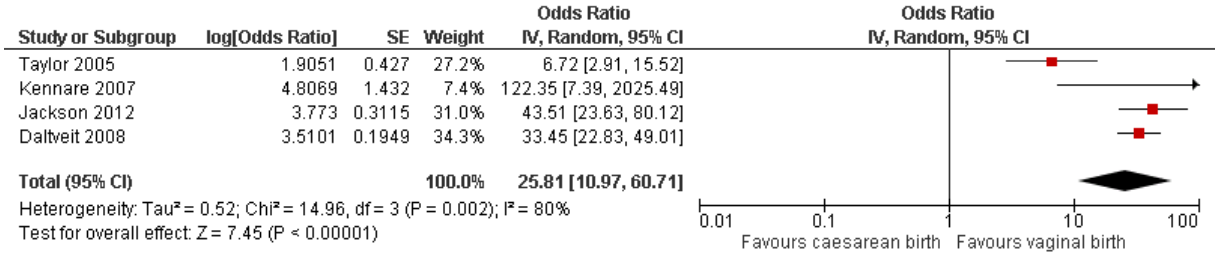
Comparison 2. Elective caesarean birth versus vaginal birth: long-term outcomes

Maternal outcomes

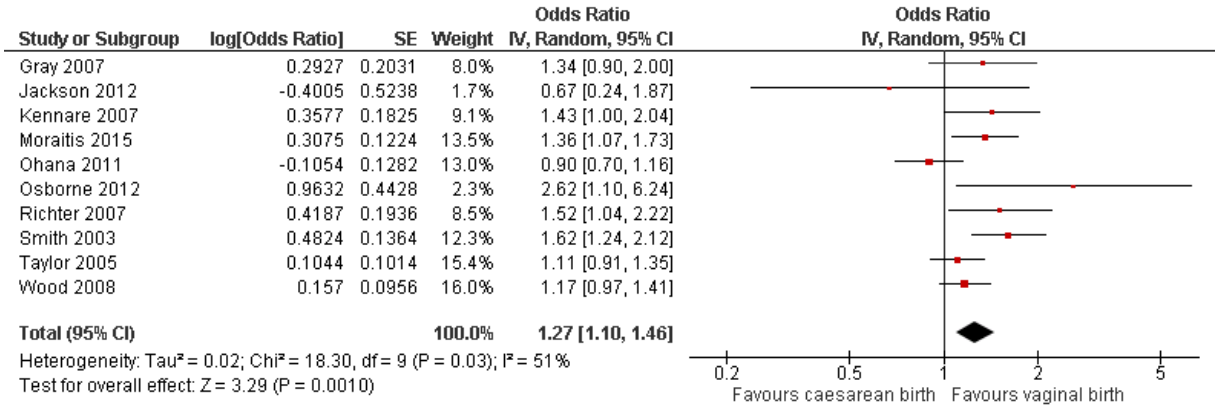
Placenta accreta in any future pregnancy



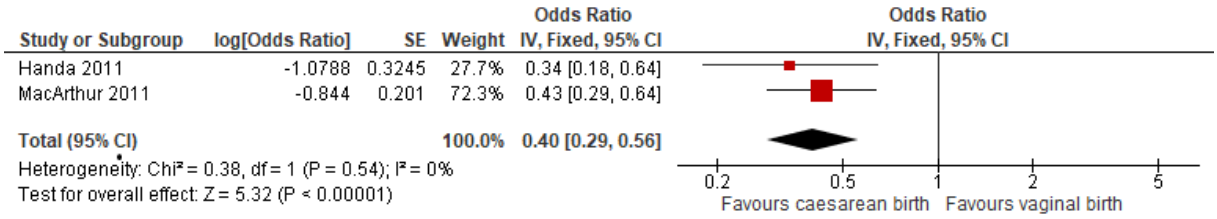
Uterine rupture in any future pregnancy



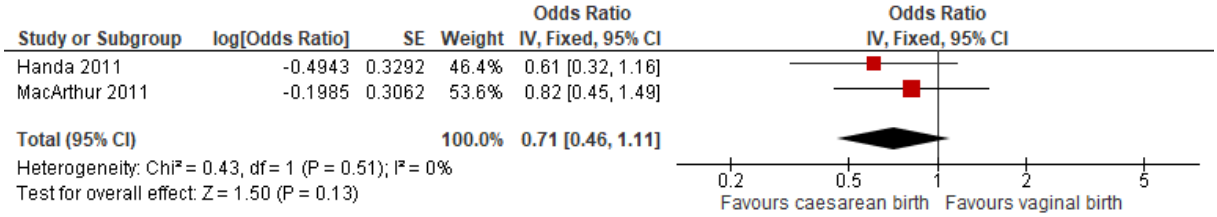
Stillbirth in any future pregnancy



Urinary incontinence >1 year postpartum (versus unassisted VB)

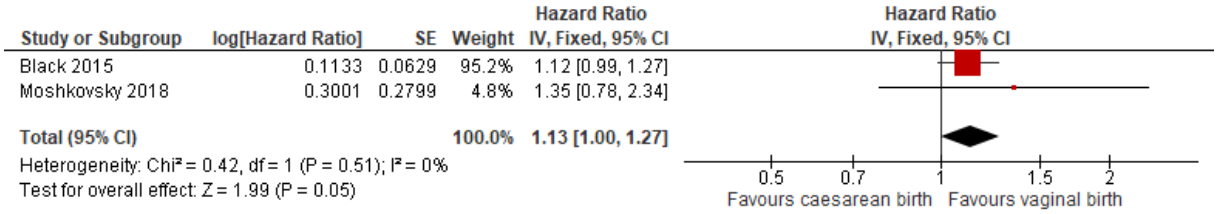


Faecal incontinence >1 year post partum (versus unassisted VB)

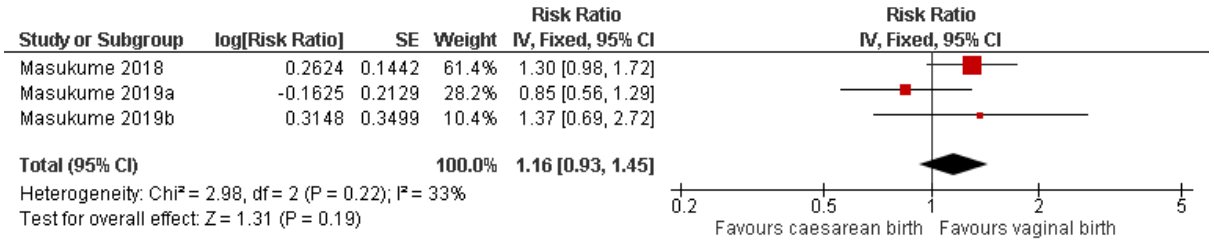


Childhood outcomes

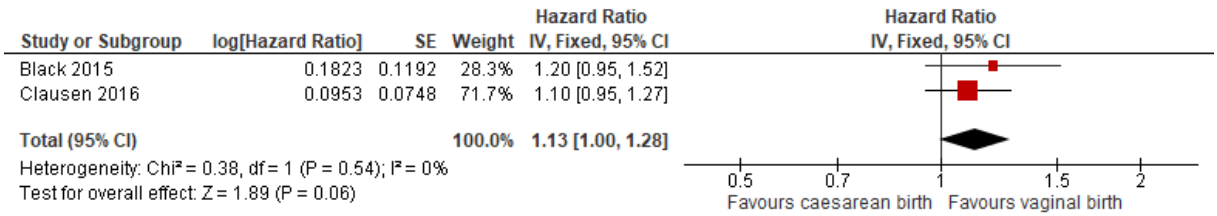
Childhood obesity



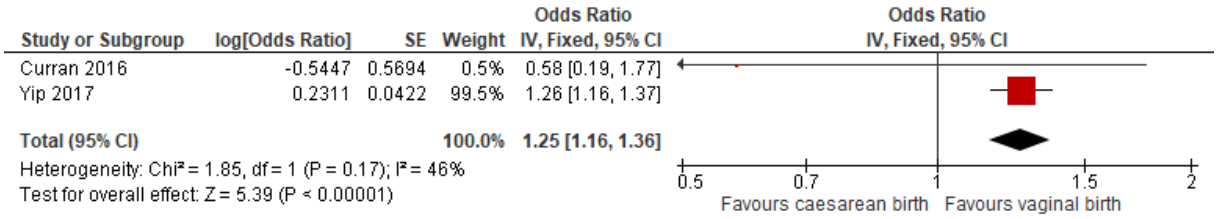
Childhood obesity



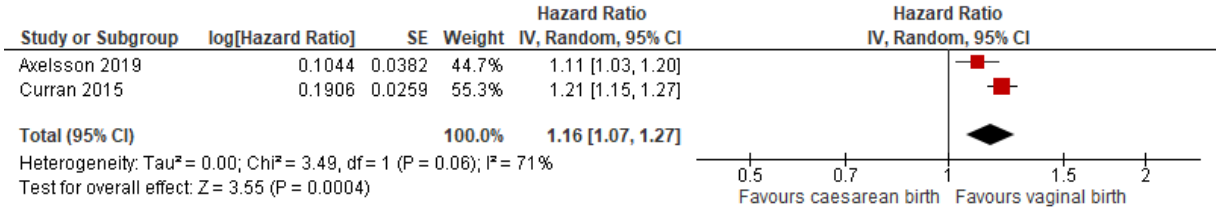
Type 1 diabetes



Autism spectrum condition



Autism spectrum condition



Appendix F – GRADE tables

GRADE tables for review question: What are the benefits and risks (short and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

Table 7: Comparison 1. Elective caesarean birth versus planned vaginal birth: short-term outcomes

Quality assessment							Number of patients		Effect			
Number of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Elective caesarean birth	Planned vaginal birth	Relative (95% CI)	Absolute	Quality	Importance
Major obstetric haemorrhage												
1 (Herstad 2016)	observational studies	no serious risk of bias	serious[1]	serious[2]	serious[3]	none	8/373 (2.1%)	90/6299 (1.4%)	RR 1.63 (0.75 to 3.54)	9 more per 1000 (from 4 fewer to 36 more)	VERY LOW	CRITICAL
Bleeding complications												
1 (Karlstrom 2013)	observational studies[4]	no serious risk of bias	serious[1]	serious[5]	no serious imprecision	none	579/5877 (9.9%)	644/12936 (5%)	OR 2.5 (2.1 to 3)	66 more per 1000 (from 49 more to 86 more)	VERY LOW	CRITICAL
Postpartum haemorrhage												
1 (Lavecchia 2016)	observational studies	no serious risk of bias	serious[1]	no serious indirectness	no serious imprecision	none	390/35170 (1.11%)	10253/406897 (2.52%)	OR 0.44 (0.39 to 0.48)	14 fewer per 1000 (from 15 fewer to 13 fewer)	VERY LOW	CRITICAL
Maternal death												
1 (Lavecchia 2016)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	25.6/100000 (0.025%)	4.4/100000 (0.004%)	OR 5.63 (2.52 to 12.55)	0 more per 1000 (from 0 more to 0 more)	LOW	CRITICAL
Intensive treatment unit admission												
1 (Herstad 2016)	observational studies	no serious risk of bias	no serious inconsistency	serious[2]	very serious[6]	none	1/373 (0.27%)	7/6299 (0.1%)	RR 1.13 (0.12 to 10.64)	0 more per 1000 (from 1 fewer to 11 more)	VERY LOW	CRITICAL
Peri-partum hysterectomy												

Quality assessment							Number of patients		Effect			
Number of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Elective caesarean birth	Planned vaginal birth	Relative (95% CI)	Absolute	Quality	Importance
1 (Lavecchia 2016)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	56/35170 (0.16%)	325/406897 (0.08%)	OR 1.81 (1.36 to 2.40)	1 more per 1000 (from 0 more to 1 more)	LOW	CRITICAL
Thromboembolic disease												
1 (Lavecchia 2016)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[3]	none	7/35170 (0.02%)	40/406897 (0.01%)	OR 1.87 (0.84 to 4.18)	0 more per 1000 (from 0 fewer to 0 more)	VERY LOW	CRITICAL
Neonatal mortality												
1 (MacDorman 2008)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	469/271179 (0.17%)	4500/7138068 (0.06%)	OR 2.34 (2.13 to 2.58)	1 more per 1000 (from 1 more to 1 more)	LOW	CRITICAL
Admission to neonatal unit												
1 (Herstad 2016)	observational studies	no serious risk of bias	no serious inconsistency	serious[2]	serious[3]	none	16/373 (4.3%)	282/6299 (4.5%)	RR 0.86 (0.5 to 1.48)	6 fewer per 1000 (from 22 fewer to 21 more)	VERY LOW	CRITICAL
Respiratory morbidity												
1 (Herstad 2016)	observational studies	no serious risk of bias	serious[1]	serious[2]	serious[3]	none	5/373 (1.3%)	82/6299 (1.3%)	RR 0.94 (0.36 to 2.46)	1 fewer per 1000 (from 8 fewer to 19 more)	VERY LOW	CRITICAL
Respiratory distress syndrome												
1 (Karlstrom 2013)	observational studies[3]	no serious risk of bias	serious[1]	serious[5]	no serious imprecision	none	159/5877 (2.7%)	132/12936 (1%)	OR 2.7 (1.8 to 4.05)	17 more per 1000 (from 8 more to 28 more)	VERY LOW	CRITICAL
Infectious morbidity												
1 (Herstad 2016)	observational studies	no serious risk of bias	no serious inconsistency	serious[2]	serious[3]	none	4/373 (1.1%)	154/6299 (2.4%)	RR 0.43 (0.16 to 1.19)	14 fewer per 1000 (from 21 fewer to 5 more)	VERY LOW	CRITICAL
Infectious morbidity												

Quality assessment							Number of patients		Effect		Quality	Importance
Number of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Elective caesarean birth	Planned vaginal birth	Relative (95% CI)	Absolute		
1 (Karlstrom 2013)	observational studies[4]	no serious risk of bias	no serious inconsistency	serious[5]	serious[3]	none	29/5877 (0.5%)	95/12936 (0.7%)	OR 0.7 (0.4 to 1)	2 fewer per 1000 (from 4 fewer to 0 more)	VERY LOW	CRITICAL

CI: confidence interval; No: number; RR: relative risk; OR: odds ratio
[1] Contradictory evidence from studies that cannot be meta-analysed due to specifics of outcome reported
[2] The quality of the evidence was downgraded by 1 as the intervention group was analysed according to actual mode of birth
[3] The quality of the evidence was downgraded by 1 as the 95% CI crossed the line of no effect
[4] Case-control
[5] The quality of the evidence was downgraded by 1 as the control group was analysed according to actual mode of birth
[6] The quality of the evidence was downgraded by 2 as the 95% CI crossed the line of no effect and was subjectively wide

Table 8: Comparison 2. Elective caesarean birth versus vaginal birth: long-term outcomes

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Caesarean birth	Vaginal birth	Relative (95% CI)	Absolute		
Placenta accreta in any future pregnancy												
3 (Daltveit 2008, Jackson 2012, Kennare 2007)	systematic review of 3 observational studies	no serious risk of bias	no serious inconsistency	serious[1]	no serious imprecision	none	N=698374 (n per group was NR)		OR 2.43 (1.74 to 3.40)	1 more per 1000 (from 0 more to 1 more) δ	VERY LOW	CRITICAL
Uterine rupture in any future pregnancy												
4 (Daltveit 2008, Jackson 2012, Kennare 2007, Taylor 2005)	systematic review of 4 observational studies	no serious risk of bias	serious[2]	serious[1]	no serious imprecision	none	N=834475 (n per group was NR)		OR 25.81 (10.97 to 60.71)	10 more per 1000 (from 4 more to 23 more) δ	VERY LOW	CRITICAL
Stillbirth in any future pregnancy												
10 (Gray 2007, Jackson 2012, Kennare 2007, Moraitis 2015, Ohana 2011, Osborne 2012, Richter	systematic review of 10 observational studies	no serious risk of bias	serious[2]	serious[1]	no serious imprecision	none	N=972134 (n per group was NR)		OR 1.27 (1.10 to 1.46)	1 more per 1000 (from 0 more to 2 more) δ	VERY LOW	CRITICAL

Quality assessment							No of patients		Effect			
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Caesarean birth	Vaginal birth	Relative (95% CI)	Absolute	Quality	Importance
2007, Smith 2003, Taylor 2005, Wood 2008)												
Stillbirth in a second pregnancy												
1 (Franz 2009)	observational studies	no serious risk of bias	serious[3]	serious[1]	serious[4]	none	94538	535277	HR 1.30 (0.93 to 1.82)	1 more per 1000 (from 0 fewer to 3 more) δ	VERY LOW	CRITICAL
Stillbirth in a subsequent pregnancy												
1 (Bahtiyar 2006)	observational studies	no serious risk of bias	serious[3]	serious[1]	no serious imprecision	none	N=9287701 (n per group was NR)		RR 0.88 (0.83 to 0.93)	0 fewer per 1000 (from 1 fewer to 0 fewer) δ	VERY LOW	CRITICAL
Urinary incontinence >1 year postpartum (versus unasssisted VB)												
2 (Handa 2011, MacArthur 2011)	observational studies	serious[5]	no serious inconsistency	no serious indirectness	no serious imprecision	none	62/316 (19.6%)	1160/2177 (48.7%)	OR 0.40 (0.29 to 0.56)	212 fewer per 1000 (from 140 fewer to 217 fewer)	VERY LOW	CRITICAL
Urinary incontinence >1 year postpartum (versus assisted VB)												
1 (Handa 2011)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	14/192 (7.3%)	25/126 (19.8%)	OR 0.22 (0.10 to 0.46)	147 fewer per 1000 (from 96 fewer to 174 fewer)	LOW	CRITICAL
Faecal incontinence >1 year postpartum (versus unassisted VB)												
2 (Handa 2011, MacArthur 2011)	observational studies	serious[5]	no serious inconsistency	no serious indirectness	serious[4]	none	28/316 (8.9%)	250/2177 (11.5%)	OR 0.71 (0.46 to 1.11)	30 fewer per 1000 (from 59 fewer to 11 more)	VERY LOW	CRITICAL
Faecal incontinence >1 year postpartum (versus assisted VB)												
1 (Handa 2011)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	15/192 (7.8%)	19/126 (15.1%)	OR 0.45 (0.21 to 0.94)	77 fewer per 1000 (from 8 fewer to 115 fewer)	LOW	CRITICAL
Postnatal depression												

Quality assessment							No of patients		Effect			
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Caesarean birth	Vaginal birth	Relative (95% CI)	Absolute	Quality	Importance
1 (Xu 2017)	systematic review of 6 observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[4]	none	N=13221 (n per group was NR)		OR 1.15 (0.92 to 1.44)	10 more per 1000 (from 6 fewer to 30 more)	VERY LOW	CRITICAL
Infant mortality (up to 1 year of age)												
1 (Black 2015)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[4]	none	26/12355 (0.21%)	384/252917 (0.15%)	HR 1.43 (0.95 to 2.15)	1 more per 1000 (from 0 fewer to 2 more)	VERY LOW	CRITICAL
Cerebral palsy												
1 (Petridou 1996)	observational studies[6]	very serious[7]	no serious inconsistency	no serious indirectness	no serious imprecision	none	4/22 (18.2%)	72/271 (26.6%)	OR 0.08 (0.01 to 0.64)	238 fewer per 1000 (from 78 fewer to 262 fewer)	VERY LOW	CRITICAL
Persistent verbal delay												
1 (Hanrahan 2019)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[4]	none	19/846 (2.2%)	131/6020 (2.2%)	OR 1.23 (0.74 to 2.04)	5 more per 1000 (from 6 fewer to 22 more)	VERY LOW	CRITICAL
Obesity (childhood)												
2 (Black 2015, Moshkovsky 2018)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	317/14450 (2.2%)	4741/168998 (2.8%)	HR 1.13 (1 to 1.27)	4 more per 1000 (from 0 more to 7 more)	LOW	CRITICAL
Obesity (childhood)												
3 (Masukume 2018, Masukume 2019a, Masukume 2019b)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[4]	none	120/2176 (5.5%)	614/11490 (5.3%)	RR 1.16 (0.93 to 1.45)	9 more per 1000 (from 4 fewer to 24 more)	VERY LOW	CRITICAL
Asthma												
1 (Huang 2015)	systematic review of 8 observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	N=2782769 (n per group was NR)		OR 1.21 (1.17 to 1.25)	3 more per 1000 (from 3 more to 4 more) [δ]	LOW	CRITICAL
Type 1 diabetes												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Caesarean birth**	**Vaginal birth**	**Relative (95% CI)**	**Absolute**		
1 (Khashan 2014)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	154498	2094481	RR 1.15 (1.06 to 1.25)	1 more per 1000 (from 0 more to 1 more) δ	LOW	CRITICAL
Type 1 diabetes												
2 (Black 2015, Clausen 2016)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	375/135144 (0.28%)	4847/1750529 (0.27%)	HR 1.13 (1 to 1.28)	1 more per 1000 (from 0 more to 1 more)	LOW	CRITICAL
Type 1 diabetes; sibling control analysis												
1 (Khashan 2014)	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[4]	none	N=2200 (n per group NR)		RR 1.06 (0.85 to 1.32)	0 more per 1000 (from 1 fewer to 2 more) δ	VERY LOW	CRITICAL
Autism spectrum condition												
2 (Curran 2016, Yip 2017)	observational studies	no serious risk of bias	serious[3]	no serious indirectness	no serious imprecision	none	1957/244799 (0.8%)	25843/4322061 (0.59%)	OR 1.25 (1.16 to 1.36)	1 more per 1000 (from 1 more to 2 more)	LOW	CRITICAL
Autism spectrum condition												
2 (Axelsson 2019, Curran 2015)	observational studies	no serious risk of bias	serious[3]	no serious indirectness	no serious imprecision	none	227545	2714885	HR 1.16 (1.07 to 1.27)	2 more per 1000 (from 1 more to 3 more) δ	LOW	CRITICAL
Autism spectrum condition; sibling control analysis												
1 (Axelsson 2019)	observational studies	no serious risk of bias	serious[3]	no serious indirectness	serious[4]	none	NR	NR	HR 0.97 (0.83 to 1.13)	0 fewer per 1000 (from 2 fewer to 1 more) δ	VERY LOW	CRITICAL
Autism spectrum condition; sibling control analysis												
1 (Curran 2015)	observational studies	no serious risk of bias	serious[3]	no serious indirectness	serious[4]	none	NR	NR	OR 0.89 (0.76 to 1.04)	1 fewer per 1000 (from 2 fewer to 0 more) δ	VERY LOW	CRITICAL

CI: confidence interval; HR: hazard ratio; No: number; NR: not reported; RR: relative risk; OR: odds ratio; VB: vaginal birth
δControl group risk was not reported by the study. See Appendix O for more information
[1] The quality of the evidence was downgraded by 1 as any type of caesarean birth (elective, emergency) was included
[2] The quality of the evidence was downgraded by 1 due to serious heterogeneity (I^2>50%)
[3] Contradictory evidence from studies that cannot be meta-analysed due to specifics of outcome reported

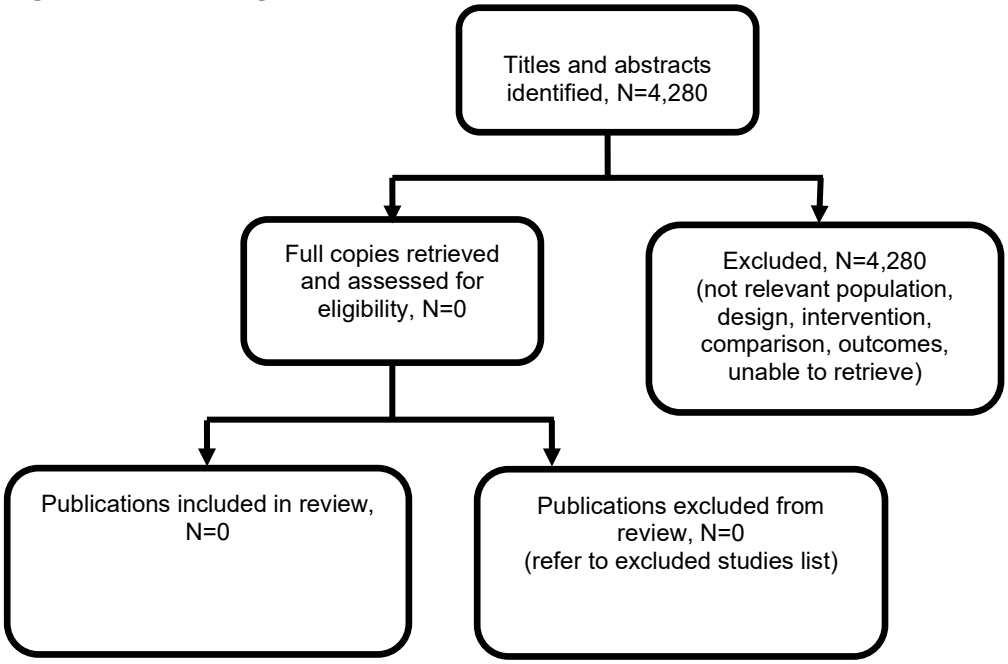
[4] *The quality of the evidence was downgraded by 1 as the 95% CI crossed the line of no effect*
[5] *The quality of the evidence was downgraded by 1 as mode of birth was self-reported and loss to follow-up was greater than 20%*
[6] *Case-control*
[7] *The quality of the evidence was downgraded by 2 due to very high risk of selection bias and due to the mode of birth being self-reported*

Appendix G – Economic evidence study selection

Economic evidence study selection for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

No economic evidence was identified which was applicable to this review question.

Figure 3: Flow diagram of economic article selection



Appendix H – Economic evidence tables

Economic evidence tables for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

No evidence was identified which was applicable to this review question

Appendix I – Health economic evidence profiles

Health economic evidence profiles for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

No evidence was identified which was applicable to this review question

Appendix J – Health economic analysis

Health economic analysis for review question 1: What are the benefits and risks (short-and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

No economic analysis was conducted for this review question.

Appendix K – Excluded studies

Excluded studies for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

Clinical studies

Table 9: Clinical studies: short-term outcomes

Study	Reason for Exclusion
Abdel-Latif, Mohamed E., Bolisetty, Srinivas, Abeywardana, Samanthi, Lui, Kei, Australian,, New Zealand Neonatal, Network, Mode of delivery and neonatal survival of infants with gastroschisis in Australia and New Zealand, Journal of Pediatric Surgery, 43, 1685-90, 2008	Infants had gastroschisis, which may overestimate the number of deaths (only relevant outcome reported)
Abenhaim, Haim A., Benjamin, Alice, Effect of prior cesarean delivery on neonatal outcomes, Journal of Perinatal Medicine, 39, 241-4, 2011	Study included any type of caesarean section (elective and emergency procedures)
Abramowitz, L., Moine, A. B., Le Tohic, A., De Carne Carnavalet, C., Benbara, A., Girard, G., Poujade, O., Roy, C., Tubach, F., Effect of mode of delivery on anal incontinence following a second delivery in women with sphincter disruption resulting from the first delivery: the EPIC multicenter randomized trial, Colorectal Disease, 19, 4â□□, 2017	Study abstract
Aliyar, R., Fong, F., Khan, B., Thamban, S., Visvanathan, D., Vaginal birth after caesarean section - Acceptability and outcome in an East London University Hospital, BJOG: An International Journal of Obstetrics and Gynaecology, 119, 66, 2012	Study abstract
Allen, Victoria M., O'Connell, Colleen M., Baskett, Thomas F., Maternal morbidity associated with cesarean delivery without labor compared with induction of labor at term, Obstetrics and Gynecology, 108, 286-94, 2006	Study included women with medical/obstetric indication for caesarean section
Atalla,R.K., Thompson,J.R., Oppenheimer,C.A., Bell,S.C., Taylor,D.J., Reactive thrombocytosis after caesarean section and vaginal delivery: implications for maternal thromboembolism and its prevention, BJOG: An International Journal of Obstetrics and Gynaecology, 107, 411-414, 2000	Study included any type of caesarean section (elective and emergency procedures)
Baghestan, Elham, Irgens, Lorentz M., Bordahl, Per E., Rasmussen, Svein, Trends in risk factors for obstetric anal sphincter	No relevant caesarean section comparison group was included

Study	Reason for Exclusion
injuries in Norway, Obstetrics and Gynecology, 116, 25-34, 2010	
Baghirzada, L., Downey, K. N., Macarthur, A. J., Assessment of quality of life indicators in the postpartum period, International Journal of Obstetric Anesthesia, 22, 209-216, 2013	Study did not adjust for confounders
Bashir, Rani A., Vayalthrikkovil, Sakeer, Espinoza, Liza, Irvine, Leigh, Scott, James, Mohammad, Khorshid, Prevalence and Characteristics of Intracranial Hemorrhages in Neonates with Hypoxic Ischemic Encephalopathy, American Journal of Perinatology, 35, 676-681, 2018	No relevant population; study did not compare vaginal birth with caesarean section
Benedetto, Chiara, Marozio, Luca, Prandi, Giovanna, Roccia, Ajit, Blefari, Silvia, Fabris, Claudio, Short-term maternal and neonatal outcomes by mode of delivery. A case-controlled study, European journal of obstetrics, gynecology, and reproductive biology, 135, 35-40, 2007	Study did not control for confounders
Bevan, M. E., Duvalla, S., Ramalingam, K., Management of postpartum haemorrhage, BJOG: An International Journal of Obstetrics and Gynaecology, 120, 49-50, 2013	Study abstract
Blondon, Marc, Casini, Alessandro, Hoppe, Kara K., Boehlen, Francoise, Righini, Marc, Smith, Nicholas L., Risks of Venous Thromboembolism After Cesarean Sections: A Meta-Analysis, Chest, 150, 572-96, 2016	Article not in English
Bodner, Klaus, Wierrani, Franz, Grunberger, Werner, Bodner-Adler, Barbara, Influence of the mode of delivery on maternal and neonatal outcomes: a comparison between elective cesarean section and planned vaginal delivery in a low-risk obstetric population, Archives of Gynecology and Obstetrics, 283, 1193-8, 2011	Study did not adjust for confounders
Bossano, Carla M., Townsend, Kelly M., Walton, Alexandra C., Blomquist, Joan L., Handa, Victoria L., The maternal childbirth experience more than a decade after delivery, American Journal of Obstetrics and Gynecology, 217, 342.e1-342.e8, 2017	Time period extends beyond 6 weeks (follow-up established for HRQoL outcome)
Bouvier-Colle, M. H., Varnoux, N., Salanave, B., Ancel, P. Y., Breart, G., Case-control study of risk factors for obstetric patients' admission to intensive care units, European Journal of Obstetrics, Gynecology, & Reproductive BiologyEur J Obstet Gynecol Reprod Biol, 74, 173-7, 1997	No relevant population; study did not compare vaginal birth with caesarean section
Boyo, M., Burke, N., McAuliffe, F., Morrison, J., Turner, M., Dornan, S., Higgins, J., Cotter, A., Geary, M., Daly, S., McParland, P., Dicker, P., Tully, E., Malone, F. D., Current neonatal intensive care unit admissions in the 'low risk' nulliparous patient, BJOG: An	Study abstract

Study	Reason for Exclusion
International Journal of Obstetrics and Gynaecology, 123, 53, 2016	
Broe, S., Khoo, S. K., How safe is caesarean section in current practice? A survey of mortality and serious morbidity, Australian & New Zealand Journal of Obstetrics & Gynaecology, 29, 93-8, 1989	No relevant caesarean section comparison group was included
Butt, Tayyaba Khawar, Farooqui, Rehan, Khan, M. Aman Ullah, Risk factors for hypoxic ischemic encephalopathy in children, Journal of the College of Physicians and Surgeons--Pakistan : JCPSP, 18, 428-32, 2008	Study developed in a low/middle income country (Pakistan)
Buzaglo, Naama, Harlev, Avi, Sergienko, Ruslan, Sheiner, Eyal, Risk factors for early postpartum hemorrhage (PPH) in the first vaginal delivery, and obstetrical outcomes in subsequent pregnancy, The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians, 28, 932-7, 2015	No relevant population; study did not compare vaginal birth with caesarean section
Cerruto, M. A., D'Elia, C., Aloisi, A., Fabrello, M., Artibani, W., Prevalence, incidence and obstetric care impact for women with urinary incontinence in Europe: a systematic and qualitative review of the literatur, Neurourology and Urodynamics, 1), 2-3, 2011	Study abstract
Chaliha,C., Sultan,A.H., Bland,J.M., Monga,A.K., Stanton,S.L., Anal function: effect of pregnancy and delivery, American Journal of Obstetrics and Gynecology, 185, 427-432, 2001	No relevant caesarean section comparison group was included
Chan, S. S. C., Cheung, R. Y. K., Lee, L. L., Yiu, A. K. W., Health related quality of life on pelvic floor in women one year after delivery according to their mode of delivery, BJOG: An International Journal of Obstetrics and Gynaecology, 121, 231, 2014	Study abstract
Chellamma, V. K., Kalaiselvi, N., Umadevi, N., Study of maternal and fetal outcome in second stage caesarean sections and instrumental vaginal delivery, BJOG: An International Journal of Obstetrics and Gynaecology, 121, 146, 2014	Study abstract
Chew,S., Biswas,A., Caesarean and postpartum hysterectomy, Singapore Medical Journal, 39, 9-13, 1998	No relevant vaginal birth comparison group was included
Contag, S. A., Clifton, R. G., Bloom, S. L., Spong, C. Y., Varner, M. W., Rouse, D. J., Ramin, S. M., Caritis, S. N., Peaceman, A. M., Sorokin, Y., Sciscione, A., Carpenter, M. W., Mercer, B. M., Thorp, J. M., Malone, F. D., Iams, J. D., Neonatal outcomes and operative vaginal delivery versus cesarean	Study included women with medical/obstetric indication for caesarean section

Study	Reason for Exclusion
delivery, American Journal of Perinatology, 27, 493-499, 2010	
Crowther, C. A., Dodd, J. M., Hiller, J. E., Haslam, R. R., Robinson, J. S., Planned repeat elective caesarean section after previous caesarean section compared with planned vaginal birth is associated with improved health outcomes for women and their infants, Journal of Paediatrics and Child Health, 47, 36, 2011	Study abstract
Curet,L.B., Zachman,R.D., Rao,A.V., Poole,W.K., Morrison,J., Burkett,G., Effect of mode of delivery on incidence of respiratory distress syndrome, International Journal of Gynaecology and Obstetrics, 27, 165-170, 1988	Included women were at higher medical/ obstetric risk as presented with diabetes/ chronic hypertension or pre-eclampsia
Deneux-Tharaux, C., Carmona, E., Bouvier-Colle, M. H., Breart, G., Postpartum maternal mortality and cesarean delivery, Obstetrics and Gynecology, 108, 541-548, 2006	Case-control study; the only relevant outcome reported was maternal mortality and there is already evidence for that outcome from observational studies
Dera, A., Breborowicz, G. H., Szczapa-Krenz, H., Natural delivery is safe: outcome differences by mode of delivery by time, Journal of maternal-fetal & neonatal medicine, 22, 43â□□44, 2009	Study abstract
Derman, R., Maternal and neonatal complications to long term of cesarean section, International Journal of Gynecology and Obstetrics, 143, 92, 2018	Study abstract
DiPiazza, DeAnn, Richter, Holly E., Chapman, Victoria, Cliver, Suzanne P., Neely, Cherry, Chen, Chi Chiung, Burgio, Kathryn L., Risk factors for anal sphincter tear in multiparas, Obstetrics and Gynecology, 107, 1233-7, 2006	No relevant population; study did not compare vaginal birth with caesarean section
Dodd, Jodie, Crowther, Caroline, Vaginal birth after Caesarean versus elective repeat Caesarean for women with a single prior Caesarean birth: a systematic review of the literature, The Australian & New Zealand journal of obstetrics & gynaecology, 44, 387-91, 2004	No relevant population; study did not compare vaginal birth with caesarean section
Eason,E., Labrecque,M., Marcoux,S., Mondor,M., Anal incontinence after childbirth, CMAJ Canadian Medical Association Journal, 166, 326-330, 2002	No relevant caesarean section comparison group was included
Fallahi,M., Keshtmand,G., Bassir,M.F., Effects of delivery mode on short-term neonatal outcomes, Iranian Journal of Neonatology, 5, 25-28, 2014	Study conducted in a low/middle income country
Farchi, Sara, Di Lallo, Domenico, Franco, Francesco, Polo, Arianna, Lucchini, Renato, Calzolari, Flaminia, De Curtis, Mario, Neonatal respiratory morbidity and mode of delivery in a population-based study of low-risk pregnancies, Acta Obstetricia et	Results analysed according to actual mode of birth

Study	Reason for Exclusion
Gynecologica Scandinavica, 88, 729-32, 2009	
Farrukh, R., Dar, A., Naheed, F., Comparison of fetomaternal outcome of vaginal delivery and cesarean section, Biomedica, 23, 102â□□106, 2007	Study unavailable
Fitzpatrick, Kathryn E., Kurinczuk, Jennifer J., Alfirevic, Zarko, Spark, Patsy, Brocklehurst, Peter, Knight, Marian, Uterine rupture by intended mode of delivery in the UK: a national case-control study, PLoS Medicine, 9, e1001184, 2012	No relevant population; study included women with uterine rupture in their previous pregnancy versus women without a uterine rupture, regardless of their mode of birth
Fitzpatrick, M., Cassidy, M., Barassaud, M. L., Hehir, M. P., Hanly, A. M., O'Connell, P. R., O'Herlihy, C., Does anal sphincter injury preclude subsequent vaginal delivery?, European journal of obstetrics, gynecology, and reproductive biology, 198, 30-4, 2016	No relevant population; study included women with a documented obstetric anal sphincter injury
Fodstad, Kathrine, Staff, Anne Cathrine, Laine, Katariina, Sexual activity and dyspareunia the first year postpartum in relation to degree of perineal trauma, International Urogynecology Journal, 27, 1513-23, 2016	No relevant population; study did not compare vaginal birth with caesarean section
Fritel, X., Pizzoferrato, A., Fauconnier, A., Guilhot, J., Is it possible to predict the risk of postnatal urinary or fecal incontinence prior to delivery?, Neurourology and Urodynamics, 36, S237â□□S238, 2017	Study abstract
Gallagher, A. C., Hersh, A. R., Scrivner, K. J., Tilden, E., Caughey, A. B., Operative vaginal delivery compared to cesarean section modeled for a second pregnancy: A cost-effectiveness analysis, American Journal of Obstetrics and Gynecology, 218, S347, 2018	Study abstract
Geary, M., Fanagan, M., Boylan, P., Maternal satisfaction with management in labour and preference for mode of delivery, Journal of Perinatal Medicine, 25, 433-9, 1997	No relevant population; study did not compare vaginal birth with caesarean section
Geller, Elizabeth J., Wu, Jennifer M., Jannelli, Mary L., Nguyen, Thao V., Visco, Anthony G., Maternal outcomes associated with planned vaginal versus planned primary cesarean delivery, American Journal of Perinatology, 27, 675-83, 2010	Study included women with medical/obstetric indication for caesarean section
Geller,E.J., Wu,J.M., Jannelli,M.L., Nguyen,T.V., Visco,A.G., Neonatal outcomes associated with planned vaginal versus planned primary cesarean delivery, Journal of Perinatology, 30, 258-264, 2010	Study included women with medical/obstetric indication for caesarean section
Ghahiri, Ataollah, Khosravi, Mehrnoush, Maternal and neonatal morbidity and mortality rate in caesarean section and vaginal delivery, Advanced biomedical research, 4, 193, 2015	Study conducted in a low/middle income country (Iran)

Study	Reason for Exclusion
Gyhagen, M., Akervall, S., Othman, J. A., Nilsson, I., Milsom, I., The age-dependent prevalence and severity of urinary incontinence after one pregnancy and one vaginal delivery and the attributable risk reduction with C-section, Neurourology and Urodynamics, 37, S369â□□S371, 2018	Study abstract
Hales,K.A., Morgan,M.A., Thurnau,G.R., Influence of labor and route of delivery on the frequency of respiratory morbidity in term neonates, International Journal of Gynaecology and Obstetrics, 43, 35-40, 1993	Study did not adjust for confounders
Hankins, Gary D. V., Clark, Shannon M., Munn, Mary B., Cesarean section on request at 39 weeks: impact on shoulder dystocia, fetal trauma, neonatal encephalopathy, and intrauterine fetal demise, Seminars in Perinatology, 30, 276-87, 2006	Systematic review: no relevant outcomes were reported
Hansen, Anne Kirkeby, Wisborg, Kirsten, Uldbjerg, Niels, Henriksen, Tine Brink, Risk of respiratory morbidity in term infants delivered by elective caesarean section: cohort study, BMJ (Clinical research ed.), 336, 85-7, 2008	Study included women with medical/obstetric indication for caesarean section
Harkin, Rosemary, Fitzpatrick, Myra, O'Connell, P. Ronan, O'Herlihy, Colm, Anal sphincter disruption at vaginal delivery: is recurrence predictable?, European journal of obstetrics, gynecology, and reproductive biology, 109, 149-52, 2003	No relevant caesarean section comparison group was included
Herstad, L., Vangen, S., Klungsoyr, K., Skjaerven, R., Obstetric complications according to maternal age in planned vaginal delivery. A population based registry study of low-risk women, Acta Obstetricia et Gynecologica Scandinavica, 159), 86, 2012	Study abstract
Holm, C., Langhoff-Roos, J., Petersen, K. B., Norgaard, A., Diness, B. R., Severe postpartum haemorrhage and mode of delivery: a retrospective cohort study, BJOG: An International Journal of Obstetrics & Gynaecology, 119, 596-604, 2012	No relevant outcomes were reported
Hristova, I., Vakrilova, L., Dimitrova, V., Zlatkov, G., Slancheva, B., Mode of delivery, illness severity and short term outcome of very low birth weight neonates, Journal of Perinatal Medicine, 43, 2015	Study abstract
Hughes, K., Mary, N., A splash of red: A review of the major postpartum haemorrhages from NHS Lothian in 2016-2017, BJOG: An International Journal of Obstetrics and Gynaecology, 124 (Supplement 5), 21-22, 2017	Study abstract
Jansen, A. J. G., Essink-Bot, M. L., Duvekot, J. J., van Rhenen, D. J., Psychometric evaluation of health-related quality of life measures in women after different types of	Study included women undergoing caesarean section for medical indication (breech/ previous CS)

Study	Reason for Exclusion
delivery, Journal of Psychosomatic Research, 63, 275-281, 2007	
Joseph, K. S., Shiliang, L., Muraca, G. M., Sabr, Y., Pressey, T., Liston, R. M., Mode of delivery after a previous cesarean birth, and associated maternal and neonatal morbidity, CMAJ, 190, E556-E564, 2018	No relevant interventions; repeat cesarean section versus trial of labour after caesarean section
Kallianidis, A. F., Schutte, J. M., van Roosmalen, J., van den Akker, T., Maternal mortality after cesarean section in the Netherlands, European Journal of Obstetrics and Gynecology and Reproductive Biology, 229, 148-152, 2018	No relevant vaginal birth comparison group was included
Karmarkar, Roopali, Bhide, Alka, Digesu, Alex, Khullar, Vik, Fernando, Ruwan, Mode of delivery after obstetric anal sphincter injury, European journal of obstetrics, gynecology, and reproductive biology, 194, 7-10, 2015	Study included women undergoing caesarean section for medical indication
Kim, B. I., Choi, J. H., Yun, C. K., Changes of Respiratory Indices and Clinical Response to the Different Modes of Delivery for Administration of Surfactant Replacement Therapy in the Respiratory Distress Syndrome, Journal of the korean society of neonatology, 4, 205â□□216, 1997	Study not in English
Kimura, T., Takeuchi, M., Imai, T., Tanaka, S., Kawakami, K., Neurodevelopment at 3 Years in Neonates Born by Vaginal Delivery versus Cesarean Section at <26 Weeks of Gestation: Retrospective Analysis of a Nationwide Registry in Japan, Neonatology, 112, 258-266, 2017	Study included pre-term births
Kitchen,W., Ford,G.W., Doyle,L.W., Rickards,A.L., Lissenden,J.V., Pepperell,R.J., Duke,J.E., Cesarean section or vaginal delivery at 24 to 28 weeks' gestation: comparison of survival and neonatal and two-year morbidity, Obstetrics and Gynecology, 66, 149-157, 1985	Study included pre-term births
Kok, N., Kazemier, B., Mol, B. W., Pajkrt, E., Maternal and neonatal complications in subsequent pregnancy after first birth cesarean section or vaginal delivery; A nationwide comparative cohort study, American Journal of Obstetrics and Gynecology, 208, S73-S74, 2013	Study abstract
Kolas,T., Saugstad,O.D., Daltveit,A.K., Nilsen,S.T., Oian,P., Planned cesarean versus planned vaginal delivery at term: comparison of newborn infant outcomes, American Journal of Obstetrics and Gynecology, 195, 1538-1543, 2006	Study included women with medical/obstetric indication for caesarean section
Kor-Anantakul,O., Suwanrath,C., Lim,A., Chongsuviwatwong,V., Comparing complications in intended vaginal and	Study conducted in a low/middle income country (Thailand)

Study	Reason for Exclusion
caesarean deliveries, Journal of Obstetrics and Gynaecology, 28, 64-68, 2008	
Larsson, Christina, Saltvedt, Sissel, Wiklund, Ingela, Andolf, Ellika, Planned vaginal delivery versus planned caesarean section: short-term medical outcome analyzed according to intended mode of delivery, Journal of obstetrics and gynaecology Canada : JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC, 33, 796-802, 2011	Study did not adjust for confounders
Le Guennec, J. C., Bard, H., Teasdale, F., Doray, B., Elective delivery and the neonatal respiratory distress syndrome, Canadian Medical Association journal, 122, 307-9, 1980	A proportion of the included population (46%) had pre-term births (at 32 weeks)
Lee, Hyun Joo, Jeon, Gyeong Sik, Kim, Man Deuk, Kim, Sang Heum, Lee, Jong Tae, Choi, Min Jeong, Usefulness of pelvic artery embolization in cesarean section compared with vaginal delivery in 176 patients, Journal of vascular and interventional radiology : JVIR, 24, 103-9, 2013	No relevant outcomes; study reported pelvic artery embolization. Rates of major obstetric haemorrhage were not reported
Levine,E.M., Ghai,V., Barton,J.J., Strom,C.M., Mode of delivery and risk of respiratory diseases in newborns, Obstetrics and Gynecology, 97, 439-442, 2001	Study included any type of caesarean section (elective and emergency procedures)
Lilford, R. J., Van Couverden De Groot, H. A., Moore, P. J., Bingham, P., The relative risks of caesarean section (intrapartum and elective) and vaginal delivery: A detailed analysis to exclude the effects of medical disorders and other acute pre-existing physiological disturbances, British Journal of Obstetrics and Gynaecology, 97, 883-892, 1990	Study included any type of caesarean section (elective and emergency procedures)
Linder, N., Linder, I., Fridman, E., Kouadio, F., Lubin, D., Merlob, P., Yogev, Y., Melamed, N., Birth trauma-risk factors and short-term neonatal outcome, Journal of Maternal-Fetal and Neonatal Medicine, 26, 1491-1495, 2013	Study included any type of caesarean section (elective and emergency procedures)
Liu, S., Liston, R. M., Joseph, K. S., Heaman, M., Sauve, R., Kramer, M. S., Maternal mortality and severe morbidity associated with low-risk planned cesarean delivery versus planned vaginal delivery at term, CMAJ, 176, 455-460, 2007	Study included women with medical/obstetric indication for caesarean section
Liu, Xiaohua, Landon, Mark B., Cheng, Weiwei, Chen, Yan, A comparison of maternal and neonatal outcomes with forceps delivery versus cesarean delivery, The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the	Study included women with medical/obstetric indication for caesarean section

Study	Reason for Exclusion
International Society of Perinatal Obstetricians, 1-7, 2018	
MacDorman,M.F., Declercq,E., Menacker,F., Malloy,M.H., Infant and neonatal mortality for primary cesarean and vaginal births to women with "no indicated risk," United States, 1998-2001 birth cohorts, Birth: Issues in Perinatal Care, 33, 175-182, 2006	Study included any type of caesarean section (elective and emergency procedures)
Mackeen, A., Khong, S. Y., The impact of postpartum haemorrhage (PPH) on maternal morbidity, Journal of Health and Translational Medicine, 16, 94-95, 2013	Study abstract
Mallen, Christian David, Mottram, Sara, Wynne-Jones, Gwenllian, Thomas, Elaine, Birth-related exposures and asthma and allergy in adulthood: a population-based cross-sectional study of young adults in North Staffordshire, The Journal of asthma : official journal of the Association for the Care of Asthma, 45, 309-12, 2008	No relevant outcomes were reported
Metz, T. D., Gonzalez, C., Allshouse, A. A., Henry, E., Esplin, S., Influence of Patient-Level Factors on Mode of Delivery among Operative Vaginal Delivery Candidates in Modern Practice, American Journal of Perinatology, 34, 974-981, 2017	Study included women with medical/obstetric indication for caesarean section
Michailidou, S., Petridou, M., Tsapara, V., Moysidis, K., Apostolidis, A., Caesarean section versus vaginal delivery and the development of urinary incontinence and/or LUTS in premenopausal parous women, European Urology, Supplements, 18, e883, 2019	Study abstract
O'Neill, I., Gale, C. P., McCallum, A., McIntyre, H., Squire, I., Cherif, M., Impact of mode of delivery of disease management programmes on clinical outcomes among patients following hospitalised heart failure: a systematic review and meta-analysis, European Journal of Heart Failure, 19, 227â□□, 2017	Study abstract
Ozdemir, Ismail, Yucel, Nese, Yucel, Oguz, Rupture of the pregnant uterus: a 9-year review, Archives of Gynecology and Obstetrics, 272, 229-31, 2005	No relevant population; not all women had a previous pregnancy (requirement for uterine rupture outcome)
Pallasmaa, Nanneli, Ekblad, Ulla, Gissler, Mika, Severe maternal morbidity and the mode of delivery, Acta Obstetricia et Gynecologica Scandinavica, 87, 662-8, 2008	Study did not adjust for confounders
Peaceman, A. M., Lopez-Zeno, J. A., Minogue, J. P., Socol, M. L., Factors that influence route of delivery--active versus traditional labor management, American Journal of Obstetrics and Gynecology, 169, 940â□□944, 1993	No relevant outcomes were reported

Study	Reason for Exclusion
Pence, S., Kocoglu, H., Balat, O., Balat, A., The effect of delivery on umbilical arterial cord blood gases and lipid peroxides: comparison of vaginal delivery and cesarean section, Clinical and experimental obstetrics & gynecology, 29, 212â□□214, 2002	No relevant outcomes were reported
Petrou, Stavros, Kim, Sung Wook, McParland, Penny, Boyle, Elaine M., Mode of Delivery and Long-Term Health-Related Quality-of-Life Outcomes: A Prospective Population-Based Study, Birth (Berkeley, Calif.), 44, 110-119, 2017	Time period extends beyond 6 weeks (follow-up established for HRQoL outcome)
Polkowski, Moritz, Kuehnle, Elna, Schippert, Cordula, Kundu, Sudip, Hillemanns, Peter, Staboulidou, Ismini, Neonatal and Maternal Short-Term Outcome Parameters in Instrument-Assisted Vaginal Delivery Compared to Second Stage Cesarean Section in Labour: A Retrospective 11-Year Analysis, Gynecologic and Obstetric Investigation, 83, 90-98, 2018	Study included any type of caesarean section (elective and emergency procedures)
Prado, D. S., Mendes, R. B., Barreto, I. D. C., Cipolotti, R., Gurgel, R. Q., The influence of mode of delivery on neonatal and maternal short and long-term outcomes, Revista de Saude Publica, 52, 95, 2018	Study conducted in a low/middle income country (Brasil)
Quiroz, Lieschen H., Chang, Howard, Blomquist, Joan L., Okoh, Yvonne K., Handa, Victoria L., Scheduled cesarean delivery: maternal and neonatal risks in primiparous women in a community hospital setting, American Journal of Perinatology, 26, 271-7, 2009	CS due to medical/ obstetric complications
Rahman,J., Al-Ali,M., Qutub,H.O., Al-Suleiman,S.S., Al-Jama,F.E., Rahman,M.S., Emergency obstetric hysterectomy in a university hospital: A 25-year review, Journal of Obstetrics and Gynaecology, 28, 69-72, 2008	Study included women with medical/obstetric indication for caesarean section
Sharma, Shanta, Dhakal, Indra, Cesarean vs Vaginal Delivery : An Institutional Experience, JNMA; journal of the Nepal Medical Association, 56, 535-539, 2018	Study developed in a low/middle income country (Nepal)
Sheldon, W. R., Blum, J., Vogel, J. P., Souza, J. P., Gulmezoglu, A. M., Winikoff, B., W. H. O. Multicountry Survey on Maternal, Newborn Health Research, Network, Postpartum haemorrhage management, risks, and maternal outcomes: findings from the World Health Organization Multicountry Survey on Maternal and Newborn Health, BJOG: An International Journal of Obstetrics & Gynaecology, 121 Suppl 1, 5-13, 2014	Study included any type of caesarean section (elective and emergency procedures)
Shmueli, Anat, Salman, Lina, Ashwal, Eran, Hiersch, Liran, Gabbay-Benziv, Rinat, Yogev, Yariv, Aviram, Amir, Perinatal outcomes of	Study included any type of caesarean section (elective and emergency procedures)

Study	Reason for Exclusion
vacuum assisted versus cesarean deliveries for prolonged second stage of delivery at term, The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians, 30, 886-889, 2017	
Smith,J., Mousa,H.A., Peripartum hysterectomy for primary postpartum haemorrhage: incidence and maternal morbidity, Journal of Obstetrics and Gynaecology, 27, 44-47, 2007	Study included any type of caesarean section (elective and emergency procedures)
Spain, Janine E., Tuuli, Methodius G., Macones, George A., Roehl, Kimberly A., Odibo, Anthony O., Cahill, Alison G., Risk factors for serious morbidity in term nonanomalous neonates, American Journal of Obstetrics and Gynecology, 212, 799.e1-7, 2015	Study included women with medical/obstetric indication for caesarean section
Spiliopoulos, Michail, Kareti, Aparna, Jain, Neetu J., Kruse, Lakota K., Hanlon, Alex, Dandolu, Vani, Risk of peripartum hysterectomy by mode of delivery and prior obstetric history: data from a population-based study, Archives of Gynecology and Obstetrics, 283, 1261-8, 2011	Study included any type of caesarean section (elective and emergency procedures)
Spitzer,M., Fleischer,A., Schulman,H., Farmakides,G., Impact of perinatal asphyxia, mode of delivery, and duration of premature rupture of membranes on the incidence of the respiratory distress syndrome, New York State Journal of Medicine, 86, 64-67, 1986	Study included any type of caesarean section (elective and emergency procedures)
Sriskandarajah, K., Summers, J., Pollard, E., Trivedi, P., Nisar, P., Bearn, P., An eight year, pelvic floor centre experience of anal incontinence, following obstetric anal sphincter injuries (OASIs), Colorectal Disease, 18, 64â□□, 2016	Study abstract
Srp, B., Velebil, P., Proportion of caesarean sections and main causes of maternal mortality during 1978-1997 in the Czech Republic, Ceska gynekologie, 64, 219-23, 1999	No relevant population; study did not compare vaginal birth with caesarean section
Stafford, Irene, Dildy, Gary A., Clark, Steven L., Belfort, Michael A., Visually estimated and calculated blood loss in vaginal and cesarean delivery, American Journal of Obstetrics and Gynecology, 199, 519.e1-7, 2008	No relevant caesarean section comparison group was included
Tan, P. S., Tan, J. K. H., Tan, E. L., Tan, L. K., Comparison of caesarean sections and instrumental deliveries at full cervical dilatation: A retrospective review, Singapore Medical Journal, 60, 75-79, 2019	Study included any type of caesarean section (elective and emergency procedures)
Tarcomnicu, I., Dimitriu, M. C. T., Pacu, I., Gheorghiu, D. C., Calin, D. F., Hardja, H.,	Study included any type of caesarean section (elective and emergency procedures)

Study	Reason for Exclusion
Vladescu, T., Banacu, M., Ciobanu, A., Popescu, I., Jitianu, R. C., Constantin, V. D., Popa, F., Paunica-Panea, G., Bacalbaaea, N., Ionescu, C. A., Obstetric haemorrhages, a reality in spite of modern obstetrics!, Archives of the Balkan Medical Union, 50, 513-517, 2015	
Thomas, P. E., Petersen, S. G., Gibbons, K., The influence of mode of birth on neonatal survival and maternal outcomes at extreme prematurity: A retrospective cohort study, Australian and New Zealand Journal of Obstetrics and Gynaecology, 56, 60-68, 2016	Study included pre-term births
Thorp, J. A., Gaston, L., Ferrette-Smith, D., Caspers, D., Wickstrom, E., Pal, M., Mode of delivery and prediction of severe intracranial hemorrhage (ICH): a randomized double blinded placebo controlled trial, American Journal of Obstetrics and Gynecology, 172, 289, 1995	Study abstract
Thorp,J.A., Poskin,M.F., McKenzie,D.R., Heimes,B., Perinatal factors predicting severe intracranial hemorrhage, American Journal of Perinatology, 14, 631-636, 1997	No relevant population; study did not compare vaginal birth with caesarean section
Torkan, Behnaz, Parsay, Sousan, Lamyian, Minoor, Kazemnejad, Anoshirvan, Montazeri, Ali, Postnatal quality of life in women after normal vaginal delivery and caesarean section, BMC Pregnancy and Childbirth, 9, 4, 2009	Study conducted in a low/middle income country
Trivino-Juarez, J. M., Romero-Ayuso, D., Nieto-Pereda, B., Forjaz, M. J., Criado-Alvarez, J. J., Arruti-Sevilla, B., Aviles-Gamez, B., Oliver-Barrecheguren, C., Mellizo-Diaz, S., Soto-Lucia, C., Pla-Mestre, R., Health related quality of life of women at the sixth week and sixth month postpartum by mode of birth, Women & Birth: Journal of the Australian College of Midwives, 30, 29-39, 2017	Results analysed according to actual mode of birth
van der Kooy, Jacoba, Birnie, Erwin, Denktas, Semiha, Steegers, Eric A. P., Bonsel, Gouke J., Planned home compared with planned hospital births: mode of delivery and Perinatal mortality rates, an observational study, BMC Pregnancy and Childbirth, 17, 177, 2017	No relevant population; study did not compare vaginal birth with caesarean section
van Dillen, Jeroen, Zwart, Joost J., Schutte, Joke, Bloemenkamp, Kitty W. M., van Roosmalen, Jos, Severe acute maternal morbidity and mode of delivery in the Netherlands, Acta Obstetricia et Gynecologica Scandinavica, 89, 1460-5, 2010	Study did not adjust for confounders
van Ham,M.A., van Dongen,P.W., Mulder,J., Maternal consequences of caesarean section. A retrospective study of intra-	No relevant vaginal birth comparison group was included

Study	Reason for Exclusion
operative and postoperative maternal complications of caesarean section during a 10-year period, European Journal of Obstetrics, Gynecology, and Reproductive Biology, 74, 1-6, 1997	
Wainstock, Tamar, Walfisch, Asnat, Shoham-Vardi, Ilana, Segal, Idit, Sergienko, Ruslan, Landau, Daniella, Sheiner, Eyal, Term Elective Cesarean Delivery and Offspring Infectious Morbidity: A Population-Based Cohort Study, The Pediatric infectious disease journal, 38, 176-180, 2019	Study did not adjust for confounders
Wax, Joseph R., Maternal request cesarean versus planned spontaneous vaginal delivery: maternal morbidity and short term outcomes, Seminars in Perinatology, 30, 247-52, 2006	Systematic review; references checked. Most studies included babies in breech presentation

Table 10: Clinical studies: systematic reviews

Study	Reason for Exclusion
Ayers, S., Bond, R., Bertullies, S., Wijma, K., The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework, Psychological MedicinePsychol Med, 46, 1121-34, 2016	No relevant outcomes were reported
Azam, S., Khan, K., Khanam, A., Tirlapur, S. A., What are the maternal outcomes in planned elective caesarean section compared to planned trial of vaginal birth? A systematic review, BJOG: An International Journal of Obstetrics and Gynaecology, 120, 142-143, 2013	Study abstract
Azam, Sultana, Khanam, Amina, Tirlapur, Seema, Khan, Khalid, Planned caesarean section or trial of vaginal delivery? A meta-analysis, Current opinion in obstetrics & gynecology, 26, 461-8, 2014	Systematic review: included studies were not relevant, either because these were developed in low/middle income countries or because the length of follow-up was inadequate
Azami, M., Rahmati, S., Delpisheh, A., Kooti, W., Ahmadi, M. R. H., Relationship of caesarean section and childhood asthma: Meta-analysis, Iranian Journal of Allergy, Asthma and Immunology, 17, 93-94, 2018	Study abstract
Benton, M., Turnbull, D., Salter, A., Tape, N., Wilkinson, C., Women's psychosocial outcomes following an emergency caesarean section: A systematic literature review, Journal of Paediatrics and Child Health, 55, 63, 2019	Study abstract
Berhan, Y., Haileamlak, A., The risks of planned vaginal breech delivery versus planned caesarean section for term breech birth: A meta-analysis including observational studies, BJOG: An International Journal of Obstetrics and Gynaecology, 123, 49-57, 2016	Systematic review; included studies specific for babies in breech presentation, reporting on short-term outcomes (i.e. admission to neonatal unit) or outcomes not relevant for the protocol (i.e. neurological morbidity or 5-minute Apgar score <7)

Study	Reason for Exclusion
Berhan, Yifru, Berhan, Asres, A meta-analysis of selected maternal and fetal factors for perinatal mortality, Ethiopian journal of health sciences, 24 Suppl, 55-68, 2014	Only included studies from low and middle income countries
Bernardo, L. S., Simoes, R., Bernardo, W. M., de Toledo, S. F., Hazzan, M. A., Chan, H. F., Bucci, K. B., Mercuri, G., Mother-requested cesarean delivery compared to vaginal delivery: a systematic review, Revista da Associacao Medica Brasileira, 60, 302-304, 2014	Systematic review is incomplete and does not include study details or a references list
Cardwell,C.R., Stene,L.C., Joner,G., Cinek,O., Svensson,J., Goldacre,M.J., Parslow,R.C., Pozzilli,P., Brigis,G., Stoyanov,D., Urbonaite,B., Sipetic,S., Schober,E., Ionescu-Tirgoviste,C., Devoti,G., de Beaufort,C.E., Buschard,K., Patterson,C.C., Caesarean section is associated with an increased risk of childhood-onset type 1 diabetes mellitus: a meta-analysis of observational studies, Diabetologia, 51, 726-735, 2008	Systematic review used to limit the searches for type 1 diabetes, but was not included because some of the studies included women undergoing emergency caesarean birth
Curran, Eileen A., O'Neill, Sinead M., Cryan, John F., Kenny, Louise C., Dinan, Timothy G., Khashan, Ali S., Kearney, Patricia M., Research review: Birth by caesarean section and development of autism spectrum disorder and attention-deficit/hyperactivity disorder: a systematic review and meta-analysis, Journal of child psychology and psychiatry, and allied disciplines, 56, 500-8, 2015	Systematic review used for limiting the searches, but studies were not included because some of them included women undergoing emergency CS
Darmasseelane, Karthik, Hyde, Matthew J., Santhakumaran, Shalini, Gale, Chris, Modi, Neena, Mode of delivery and offspring body mass index, overweight and obesity in adult life: a systematic review and meta-analysis, PLoS ONE, 9, e87896, 2014	Outcomes included people who were 18 years and above
de Graaff, Lisanne F., Honig, Adriaan, van Pampus, Marielle G., Stramrood, Claire A. I., Preventing post-traumatic stress disorder following childbirth and traumatic birth experiences: a systematic review, Acta Obstetricia et Gynecologica Scandinavica, 97, 648-656, 2018	This systematic review focuses on interventions to prevent PTSD following birth
de la Cruz, Cara Z., Thompson, Erika L., O'Rourke, Kathleen, Nembhard, Wendy N., Cesarean section and the risk of emergency peripartum hysterectomy in high-income countries: a systematic review, Archives of Gynecology and Obstetrics, 292, 1201-15, 2015	Studies included any type of caesarean section (including elective and emergency procedures)
de Lau, Hinke, Gremmels, Hendrik, Schuitemaker, Nico W., Kwee, Anneke, Risk of uterine rupture in women undergoing trial	Compared women with a history of both caesarean section and vaginal birth versus women with a history of solely caesarean section

Study	Reason for Exclusion
of labour with a history of both a caesarean section and a vaginal delivery, Archives of Gynecology and Obstetrics, 284, 1053-8, 2011	
Eckerlund, I., Gerdtham, U. G., Estimating the effect of cesarean section rate on health outcome: Evidence from Swedish hospital data, International Journal of Technology Assessment in Health Care, 15, 123-135, 1999	No vaginal birth comparison group
Fahmy, Walid Makin, Crispim, Cibele Aparecida, Cliffe, Susan, Association between maternal death and cesarean section in Latin America: A systematic literature review, Midwifery, 59, 88-93, 2018	Systematic review: most of the included studies were not relevant because were conducted in low and middle income countries
Handa, V. L., Harris, T. A., Ostergard, D. R., Protecting the pelvic floor: obstetric management to prevent incontinence and pelvic organ prolapse, Obstetrics & Gynecology, 88, 470-8, 1996	Narrative review
Hansen, Anne Kirkeby, Wisborg, Kirsten, Uldbjerg, Niels, Henriksen, Tine Brink, Elective caesarean section and respiratory morbidity in the term and near-term neonate, Acta Obstetricia et Gynecologica Scandinavica, 86, 389-94, 2007	Studies included women with medical/obstetric indication for caesarean section
Khan, M., Khan, N., Moore, J., A systematic review of the association between childhood asthma and delivery by caesarean section, International Journal of Gynecology and Obstetrics, 143, 633, 2018	Study abstract
Khan, N., Moore, J., A systematic review of the association between the development of behavioural disorders and delivery by caesarean section, BJOG: An International Journal of Obstetrics and Gynaecology, 124, 78, 2017	Study abstract
Kuhle, S., Tong, O. S., Woolcott, C. G., Association between caesarean section and childhood obesity: a systematic review and meta-analysis, Obesity ReviewsObes Rev, 16, 295-303, 2015	Studies included women who underwent not elective CS
Li, H. t, Zhou, Y. b, Liu, J. m, The impact of cesarean section on offspring overweight and obesity: a systematic review and meta-analysis, International journal of obesity (2005), 37, 893-9, 2013	Studies included women with not elective caesarean section
Loke, A. Y., Yuen, J. W., Wong, K., Mode of delivery and urinary incontinence: A meta-analysis, Journal of Women's Health, 22, 12-13, 2013	Study abstract
McIntyre, Sarah, Taitz, David, Keogh, John, Goldsmith, Shona, Badawi, Nadia, Blair, Eve, A systematic review of risk factors for cerebral palsy in children born at term in developed countries, Developmental	Systematic review used for limiting the searches, but studies were not included because some of them included women undergoing emergency CS

Study	Reason for Exclusion
Medicine and Child Neurology, 55, 499-508, 2013	
Moameri, H., Ostadghaderi, M., Khatooni, E., Doosti-Irani, A., Association of postpartum depression and cesarean section: A systematic review and meta-analysis, Clinical Epidemiology and Global Health, 2019	Other included systematic review (Xu 2017) had wider search dates and covered more studies
Mozurkewich, E. L., Hutton, E. K., Elective repeat cesarean delivery versus trial of labor: a meta-analysis of the literature from 1989 to 1999, American Journal of Obstetrics & Gynecology, 183, 1187-97, 2000	Subgroup of women at risk
Nelson, R. L., Go, C., Darwish, R., Gao, J., Parikh, R., Kang, C., Mahajan, A., Habeeb, L., Zalavadiya, P., Patnam, M., Cesarean delivery to prevent anal incontinence: a systematic review and meta-analysis, Techniques in coloproctology, 2019	References checked; included studies were not relevant either because of an insuffiecient lenght of follow up, or because the included studies were developed in low/ middle income countries
Nelson,R., Cesarian section for the prevention of anal incontinence, Cochrane Database of Systematic Reviews, #2007. Article Number, -, 2007	References checked; studies not relevant either because insufficient lenght of follow-up or because of being conducted in low or middle income countries
O'Callaghan, Michael, MacLennan, Alastair, Cesarean delivery and cerebral palsy: a systematic review and meta-analysis, Obstetrics and Gynecology, 122, 1169-75, 2013	Systematic review, articles checked for inclusion. Most of the included studies were not relevant, either because these did not adjust for confounders or because included pre-term births
Olde, Eelco, van der Hart, Onno, Kleber, Rolf, van Son, Maarten, Posttraumatic stress following childbirth: a review, Clinical Psychology Review, 26, 1-16, 2006	No vaginal birth comparison group
Olieman, Renske M., Siemonsma, Femke, Bartens, Margaux A., Garthus-Niegel, Susan, Scheele, Fedde, Honig, Adriaan, The effect of an elective cesarean section on maternal request on peripartum anxiety and depression in women with childbirth fear: a systematic review, BMC Pregnancy and Childbirth, 17, 195, 2017	Other included systematic review (Xu 2017) had wider search dates and covered more studies
O'Neill, Sinead M., Kearney, Patricia M., Kenny, Louise C., Khashan, Ali S., Henriksen, Tine B., Lutomski, Jennifer E., Greene, Richard A., Caesarean delivery and subsequent stillbirth or miscarriage: systematic review and meta-analysis, PLoS ONE, 8, e54588, 2013	Studies included women with not elective caesarean section
Press, J. Z., Klein, M. C., Kaczorowski, J., Liston, R. M., von Dadelszen, P., Does cesarean section reduce postpartum urinary incontinence: a systematic review, Birth, 34, 228-237, 2007	Systematic review used for limiting the searches, but analyses could not be used in entirety because some of them included women undergoing emergency CS
Pretlove,S.J., Thompson,P.J., Toozs-Hobson,P.M., Radley,S., Khan,K.S., Does the mode of delivery predispose women to anal incontinence in the first year postpartum? A comparative systematic	Women were followed-up up to 1 year

Study	Reason for Exclusion
review, BJOG: An International Journal of Obstetrics and Gynaecology, 115, 421-434, 2008	
Rortveit, Guri, Hannestad, Yngvild S., Association between mode of delivery and pelvic floor dysfunction, Tidsskrift for den Norske laegeforening : tidsskrift for praktisk medicin, ny raekke, 134, 1848-52, 2014	Narrative review
Sutharsan, R., Mannan, M., Doi, S. A., Mamun, A. A., Caesarean delivery and the risk of offspring overweight and obesity over the life course: a systematic review and bias-adjusted meta-analysis, Clinical obesity, 5, 293-301, 2015	Studies included women with not elective caesarean section
Tahtinen, R. M., Cartwright, R., Tsui, J. F., Aaltonen, R. L., Aoki, Y., Joronen, K. M., Mirza, E., Oksjoki, S. M., Pesonen, J. S., Heels-Ansdell, D., Guyatt, G. H., Tikkinen, K. A. O., Long-term impact of mode of delivery on stress and urgency urinary incontinence: A systematic review and meta-analysis, Neurourology and Urodynamics, 34, S174-S175, 2015	Studies included women with not elective caesarean section
Tahtinen, R. M., Cartwright, R., Vernooij, R., Hunskar, S., Rortveit, G., Guyatt, G. H., Tikkinen, K. A. O., Mode of vaginal delivery and urinary leakage: Population-based prospective cohort study, Neurourology and Urodynamics, 36 (Supplement 3), S119-S121, 2017	Study abstract
Tahtinen, R., Cartwright, R., Tsui, J., Aaltonen, R., Aoki, Y., Cardenas, J., Dib, R. E., Joronen, K., Juaid, S. A., Kalantan, S., Kochana, M., Kopec, M., Lopes, L., Mirza, E., Oksjoki, S., Pesonen, J., Valpas, A., Wang, L., Zhang, Y., Heels-Ansdell, D., Guyatt, G., Tikkinen, K., Long-term impact of mode of delivery on stress urinary incontinence and urgency urinary incontinence: A systematic review and meta-analysis, Journal of Urology, 195, e587, 2016	Study abstract
Thavagnanam, S., Fleming, J., Bromley, A., Shields, M. D., Cardwell, C. R., A meta-analysis of the association between Caesarean section and childhood asthma, Clinical and Experimental Allergy, 38, 629-633, 2008	Other included systematic review (Huang 2015) had wider search dates and covered more studies
Thom, David H., Rortveit, Guri, Prevalence of postpartum urinary incontinence: a systematic review, Acta Obstetricia et Gynecologica Scandinavica, 89, 1511-22, 2010	Women were followed-up up to 1 year
Vadnais, Mary, Sachs, Benjamin, Maternal mortality with cesarean delivery: a literature review, Seminars in Perinatology, 30, 242-6, 2006	Studies included any type of caesarean section (including elective and emergency procedures)

Study	Reason for Exclusion
Visco, Anthony G., Viswanathan, Meera, Lohr, Kathleen N., Wechter, Mary Ellen, Gartlehner, Gerald, Wu, Jennifer M., Palmieri, Rachel, Funk, Michele Jonsson, Lux, Linda, Swinson, Tammeka, Hartmann, Katherine, Cesarean delivery on maternal request: maternal and neonatal outcomes, Obstetrics and Gynecology, 108, 1517-29, 2006	Studies included women with medical/obstetric indication for caesarean birth and reported outcomes by planned mode of birth
Viswanathan, M., Visco, A. G., Hartmann, K., Wechter, M. E., Gartlehner, G., Wu, J. M., Palmieri, R., Jonsson Funk, M., Lux, L., Swinson, T., Lohr, K. N., Cesarean delivery on maternal request, Title to be Checked, 138, 2006	Studies did not report outcomes by planned mode of birth
Yang, X. J., Sun, Y., Comparison of caesarean section and vaginal delivery for pelvic floor function of parturients: a meta-analysis, European Journal of Obstetrics and Gynecology and Reproductive Biology, 235, 42-48, 2019	Studies included women with not elective caesarean section

Table 11: Clinical studies: long-term outcomes

Study	Reason for Exclusion
Abdel-Fattah, Mohamed, Familusi, Akinbowale, Fielding, Shona, Ford, John, Bhattacharya, Sohinee, Primary and repeat surgical treatment for female pelvic organ prolapse and incontinence in parous women in the UK: a register linkage study, BMJ Open, 1, e000206, 2011	Studies included any type of caesarean section (including elective and emergency procedures)
Abramov, Yoram, Sand, Peter K., Botros, Sylvia M., Gandhi, Sanjay, Miller, Jay-James R., Nickolov, Angel, Goldberg, Roger P., Risk factors for female anal incontinence: new insight through the Evanston-Northwestern twin sisters study, Obstetrics and Gynecology, 106, 726-32, 2005	Emergency caesarean birth was included
Abramowitz, L., Sobhani, I., Ganansia, R., Vuagnat, A., Benifla, J. L., Darai, E., Madelenat, P., Mignon, M., Are sphincter defects the cause of anal incontinence after vaginal delivery? Results of a prospective study, Diseases of the Colon and Rectum, 43, 590-598, 2000	Study did not adjust for confounders
Abreu-Silva, Joao, Castro, Jorge, Maia, Catarina, Pinho, Manuela, Carvalho, Claudina, Trial of labour after caesarean section: Two-year analysis at a Portuguese centre, Journal of obstetrics and gynaecology : the journal of the Institute of Obstetrics and Gynaecology, 37, 704-708, 2017	No relevant VB group
Adams, J., Whitlow, C., Beck, D., Timmcke, A., Hicks, T., Margolin, D., There is no causal relation between the risk of delayed fecal	Conference abstract

Study	Reason for Exclusion
incontinence and childbirth, Diseases of the Colon and Rectum, 53, 565, 2010	
Adlercreutz, Emma H., Wingren, Carl Johan, Vincente, Raquel P., Merlo, Juan, Agardh, Daniel, Perinatal risk factors increase the risk of being affected by both type 1 diabetes and coeliac disease, Acta paediatrica (Oslo, Norway : 1992), 104, 178-84, 2015	No relevant population; study did not compare vaginal birth with caesarean birth
Agacayak, E., Basaranoglu, S., Tunc, S. Y., Icen, M. S., Findik, F. M., Sak, S., Gul, T., A comparison of maternal outcomes in complicated vaginal and cesarean deliveries, Clinical and Experimental Obstetrics and Gynecology, 44, 20-26, 2017	Results reported by actual rather than planned mode of birth
Ajslev, T. A., Andersen, C. S., Gamborg, M., Sorensen, T. I. A., Jess, T., Childhood overweight after establishment of the gut microbiota: the role of delivery mode, pre-pregnancy weight and early administration of antibiotics, International journal of obesity (2005), 35, 522-9, 2011	Emergency caesarean birth was included
Alkhalaf, S. Y., O'Neill, S. M., O'Keeffe, L. M., Kenny, L. C., Khashan, A. S., The impact of mode of delivery on childhood behavioral outcomes, Reproductive Sciences, 21, 196A, 2014	Study abstract
Al-Kufaishi, A., Al Zouebi, A., Erasmus, K., Mitchell, S., Emmanuel, J., Cotzias, C., A review and service evaluation of elective caesarean sections at West Middlesex University Hospital, BJOG: An International Journal of Obstetrics and Gynaecology, 120, 119, 2013	Study abstract
Almqvist, C., Cnattingius, S., Lichtenstein, P., Lundholm, C., The impact of birth mode of delivery on childhood asthma and allergic diseases--a sibling study, Clinical & Experimental Allergy, 42, 1369-76, 2012	Included in Huang 2015
Altman, Daniel, Ekstrom, Asa, Forsgren, Catharina, Nordenstam, Johan, Zetterstrom, Jan, Symptoms of anal and urinary incontinence following cesarean section or spontaneous vaginal delivery, American Journal of Obstetrics and Gynecology, 197, 512.e1-7, 2007	Emergency caesarean birth was included
Al-Zirqi, I., Stray-Pedersen, B., Forsen, L., Vangen, S., Uterine rupture after previous caesarean section, BJOG: An International Journal of Obstetrics and Gynaecology, 117, 809-820, 2010	All women had previous CS, no relevant VB comparison group
Al-Zirqi, I., Stray-Pedersen, B., Vangen, S., Risk factors for complete rupture in intact uterus after trial of labor, International Journal of Gynecology and Obstetrics, 131, E490-E491, 2015	Conference abstract
Amir, B., Allen, V. M., Kirkland, S., MacPherson, K., Farrell, S., The Long-Term Pelvic Floor Health Outcomes of Women After Childbirth: The Influence of Labour in the First Pregnancy,	No outcomes of interest were reported

Study	Reason for Exclusion
Journal of Obstetrics and Gynaecology Canada, 38, 827-838, 2016	
Andrews, Vasanth, Sultan, Abdul H., Thakar, Ranee, Jones, Peter W., Risk factors for obstetric anal sphincter injury: a prospective study, Birth (Berkeley, Calif.), 33, 117-22, 2006	No relevant outcomes were reported
Auwad, W., Hagi, S., Al kenawi, A., Altaf, Z., El-Sayed, R., Pelvic floor disorders, symptoms and quality of life after caesarean versus vaginal delivery: A prospective study of primiparous women using MRI and validated assessment tools, Neurourology and Urodynamics, 35, S136-S137, 2016	Study abstract
Bache, I., Bock, T., Volund, A., Buschard, K., Previous maternal abortion, longer gestation, and younger maternal age decrease the risk of type 1 diabetes among male offspring, Diabetes care, 22, 1063-5, 1999	No relevant population; study did not compare vaginal birth with caesarean birth
Bahl, Rachna, Patel, Roshni R., Swingler, Rebecca, Ellis, Matthew, Murphy, Deirdre J., Neurodevelopmental outcome at 5 years after operative delivery in the second stage of labor: a cohort study, American Journal of Obstetrics and Gynecology, 197, 147.e1-6, 2007	Adjusted ORs were not reported for the outcome of interest
Bammann, Karin, Peplies, Jenny, De Henauw, Stefaan, Hunsberger, Monica, Molnar, Denes, Moreno, Luis A., Tornaritis, Michael, Veidebaum, Toomas, Ahrens, Wolfgang, Siani, Alfonso, Idefics Consortium, Early life course risk factors for childhood obesity: the IDEFICS case-control study, Plos One, 9, e86914, 2014	Emergency caesarean birth was included
Bar-Meir, Maskit, Friedlander, Yechiel, Calderon-Margalit, Ronit, Hochner, Hagit, Mode of delivery and offspring adiposity in late adolescence: The modifying role of maternal pre-pregnancy body size, PLoS ONE, 14, e0209581, 2019	Emergency caesarean birth was included
Baumfeld, Yael, Walfisch, Asnat, Wainstock, Tamar, Segal, Idit, Sergienko, Ruslan, Landau, Daniella, Sheiner, Eyal, Elective cesarean delivery at term and the long-term risk for respiratory morbidity of the offspring, European Journal of Pediatrics, 177, 1653-1659, 2018	Study reported respiratory morbidity overall, which included asthma, but also brochiectasis, pneumonitis, pleural disease, obstustrive sleep apnea, and other respiratory diseases
Bentley, Jason P., Roberts, Christine L., Bowen, Jenny R., Martin, Andrew J., Morris, Jonathan M., Nassar, Natasha, Planned Birth Before 39 Weeks and Child Development: A Population-Based Study, Pediatrics, 138, 2016	Pre term births were included and analyses did not adjust for gestational age
Bharucha, A. E., Zinsmeister, A. R., Locke, G. R., Seide, B. M., McKeon, K., Schleck, C. D., Melton, Iii L. J., Risk factors for fecal incontinence: A population-based study in women, American Journal of Gastroenterology, 101, 1305-1312, 2006	CB and VB were combined for reporting results
Bilder, Deborah, Pinborough-Zimmerman, Judith, Miller, Judith, McMahon, William,	Emergency caesarean birth was included

Study	Reason for Exclusion
Prenatal, perinatal, and neonatal factors associated with autism spectrum disorders, Pediatrics, 123, 1293-300, 2009	
Birbilis, M., Moschonis, G., Mougios, V., Manios, Y., Healthy Growth Study, group, Manios Y, Moschonis G. Skenderi K. P. Grammatikaki E. Androutsos O. Tanagra S. Koumpitski A. Siatitsa P. E. Vandorou A. Kyriakou E. Dede V. Kantilafti M. Farmaki A. E. Siopi A. Micheli S. Damianidi L. Margiola P. Gakni D. Iatridi V. Mavrogianni C. Michailidou K. Giannopoulou A. Argyri E. Maragkopoulou K. Spyridonos M. Tsikalaki E. Kliasios P. Naoumi A. Koutsikas K. Kondaki K. Aggelou E. Krommyda Z. Aga C. Birbilis M. Kosteria I. Zlatintsi A. Voutsadaki E. Papadopoulou E. Z. Papazi Z. Papadogiorgakaki M. Chlouveraki F. Lyberi M. Karatsikaki-Vlami N. Dionysopoulou E. Daskalou E. Mougios V. Petridou A. Papaioannou K. Tsalis G. Karagkiozidis A. Bougioukas K. Sakellaropoulou A. Skouli G. Chrousos G. P. Drakopoulou M. Charmandari E. Pervanidou P., Obesity in adolescence is associated with perinatal risk factors, parental BMI and sociodemographic characteristics, European journal of clinical nutrition, 67, 115-21, 2013	No relevant population; study did not compare vaginal birth with caesarean birth
Blomquist, J. L., Carroll, M., Munoz, A., Handa, V. L., A longitudinal study of the incidence of pelvic floor disorders after childbirth, Female Pelvic Medicine and Reconstructive Surgery, 24, S10, 2018	Study abstract
Blomquist, Joan L., Munoz, Alvaro, Carroll, Megan, Handa, Victoria L., Association of Delivery Mode With Pelvic Floor Disorders After Childbirth, JAMA, 320, 2438-2447, 2018	Emergency caesarean birth was included
Blustein, J., Attina, T., Liu, M., Ryan, A. M., Cox, L. M., Blaser, M. J., Trasande, L., Association of caesarean delivery with child adiposity from age 6 weeks to 15 years, International Journal of Obesity, 37, 900-6, 2013	Emergency caesarean birth was included
Boker, F., Alzahrani, A. J., Alsaeed, A., Alzhrani, M., Albar, R., Cesarean Section and Development of Childhood Bronchial Asthma: Is There A Risk?, Open Access Macedonian Journal of Medical Sciences, 7, 347-351, 2019	Study conducted in a low/ middle income country (Saudi Arabia)
Bollard,R.C., Gardiner,A., Duthie,G.S., Lindow,S.W., Anal sphincter injury, fecal and urinary incontinence: A 34-year follow-up after forceps delivery, Diseases of the Colon and Rectum, 46, 1083-1088, 2003	No exposures of interest
Borello-France, D., Burgio, K. L., Richter, H. E., Zyczynski, H., FitzGerald, M. P., Whitehead, W., Fine, P., Nygaard, I., Handa, V. L., Visco, A. G., Weber, A. M., Brown, M. B., Fecal and urinary incontinence in primiparous women, Obstetrics and Gynecology, 108, 863-872, 2006	No minimum 1 year follow-up (follow-up established for decal and urinary incontinence outcome)

Study	Reason for Exclusion
Borgwardt, Line, Bach, Diana, Nickelsen, Carsten, Gutte, Henrik, Boerch, Klaus, Elective caesarean section increases the risk of respiratory morbidity of the newborn, Acta paediatrica (Oslo, Norway : 1992), 98, 187-9, 2009	Study did not adjust for confounders
Botelho, S., da Silva, J. M., Palma, P., Herrmann, V., Riccetto, C., Can the delivery method influence lower urinary tract symptoms triggered by the first pregnancy, International Braz J Urol, 38, 267-276, 2012	Study did not adjust for confounders
Bowman, Z. S., Eller, A. G., Bardsley, T., Green, T., Varner, M. W., Silver, R. M., Risk factors for the development of placenta accreta, Reproductive Sciences, 20, 325A, 2013	Study abstract
Bozkurt, M., Yumru, A. E., Sahin, L., Pelvic floor dysfunction, and effects of pregnancy and mode of delivery on pelvic floor, Taiwanese Journal of Obstetrics and Gynecology, 53, 452-458, 2014	Study conducted in a low/middle income country (Turkey)
Brown, Stephanie J., Gartland, Deirdre, Donath, Susan, MacArthur, Christine, Fecal incontinence during the first 12 months postpartum: complex causal pathways and implications for clinical practice, Obstetrics and Gynecology, 119, 240-9, 2012	No relevant time frame (minimum follow-up for fecal incontinence is 1 year, as per the review protocol)
Bruske, I., Pei, Z., Thiering, E., Flexeder, C., Berdel, D., Von Berg, A., Koletzko, S., Bauer, C. P., Hoffmann, B., Heinrich, J., Schulz, H., Caesarean Section has no impact on lung function at the age of 15 years, Pediatric Pulmonology, 50, 1262-1269, 2015	Emergency caesarean birth was included
Burgio, K. L., Borello-France, D., Richter, H. E., Fitzgerald, M. P., Whitehead, W., Handa, V. L., Nygaard, I., Fine, P., Zyczynski, H., Visco, A. G., Brown, M. B., Weber, A. M., Risk factors for fecal and urinary incontinence after childbirth: The childbirth and pelvic symptoms study, American Journal of Gastroenterology, 102, 1998-2004, 2007	No relevant time frame (minimum follow-up for urinary incontinence is 1 year, as per the review protocol)
Burstyn, I., Sithole, F., Zwaigenbaum, L., Autism spectrum disorders, maternal characteristics and obstetric complications among singletons born in Alberta, Canada, Chronic diseases in Canada, 30, 125-34, 2010	Emergency caesarean birth was included
Cardwell, C. R., Carson, D. J., Patterson, C. C., Parental age at delivery, birth order, birth weight and gestational age are associated with the risk of childhood Type 1 diabetes: a UK regional retrospective cohort study, Diabetic medicine : a journal of the British Diabetic Association, 22, 200-6, 2005	No relevant population; study did not compare vaginal birth with caesarean birth
Casey, Brian M., Schaffer, Joseph I., Bloom, Steven L., Heartwell, Stephen F., McIntire, Donald D., Leveno, Kenneth J., Obstetric antecedents for postpartum pelvic floor	Study did not adjust for confounders

Study	Reason for Exclusion
dysfunction, American Journal of Obstetrics and Gynecology, 192, 1655-62, 2005	
Chang, F., Chu, C., Hung, C., Lan, Y., Lu, K., Lee, W., Gau, C., Lu, I., Yen, C., Shen, Y., Cai, Z., Huang, S., Lin, L., Wu, C., Yao, T., Influence of mode of delivery on asthma, fractional exhaled nitric oxide and total serum IgE in a cohort of children aged 6 years, Allergy: European Journal of Allergy and Clinical Immunology, 72, 556-557, 2017	Study abstract
Chang, S. R., Chen, K. H., Lin, H. H., Lin, M. I., Chang, T. C., Lin, W. A., Association of mode of delivery with urinary incontinence and changes in urinary incontinence over the first year postpartum, Obstetrics and Gynecology, 123, 568-577, 2014	Study conducted in a low/ middle income country (China)
Chang, S., Lin, H., Lin, M., Chang, T., Lin, W., Association of mode of delivery with urinary incontinence over the first year postpartum, Female Pelvic Medicine and Reconstructive Surgery, 20, S335, 2014	No relevant time frame (minimum follow-up for urinary incontinence is 1 year, as per the review protocol)
Cherif, R., Feki, I., Gassara, H., Baati, I., Sellami, R., Feki, H., Chaabene, K., Masmoudi, J., Post-partum depressive symptoms: Prevalence, risk factors and relationship with quality of life, Gynecologie Obstetrique Fertilite et Senologie, 45, 528-534, 2017	Study in French
Chojnacki, Morgan R., Holscher, Hannah D., Balbinot, Alaina R., Raine, Lauren B., Biggan, John R., Walk, Anne M., Kramer, Arthur F., Cohen, Neal J., Hillman, Charles H., Khan, Naiman A., Relations between mode of birth delivery and timing of developmental milestones and adiposity in preadolescence: A retrospective study, Early Human Development, 129, 52-59, 2019	No relevant outcomes (adiposity was reported as fat %)
Colmorn, L. B., Krebs, L., Klungsoyr, K., Jakobsson, M., Tapper, A. M., Gissler, M., Lindqvist, P. G., Kallen, K., Gottvall, K., Bordahl, P. E., Bjarnadottir, R. I., Langhoff-Roos, J., Mode of first delivery and severe maternal complications in the subsequent pregnancy, Acta Obstetricia et Gynecologica Scandinavica, 03, 03, 2017	Emergency caesarean birth was included
Connolly, Thomas J., Litman, Heather J., Tennstedt, Sharon L., Link, Carol L., McKinlay, John B., The effect of mode of delivery, parity, and birth weight on risk of urinary incontinence, International Urogynecology Journal and Pelvic Floor Dysfunction, 18, 1033-42, 2007	Comparison group were women who had never been pregnant
Curran, E. A., Dalman, C., Kearney, P. M., Kenny, L., Cryan, J. F., Dinan, T. G., Khashan, A. S., Obstetric mode of delivery and autism spectrum disorders in Sweden: A sibling design study, European Journal of Epidemiology, 30, 722, 2015	Study abstract

Study	Reason for Exclusion
Dahlgren, Leanne S., von Dadelszen, Peter, Christilaw, Jan, Janssen, Patricia A., Lisonkova, Sarka, Marquette, Gerald P., Liston, Robert M., Caesarean section on maternal request: risks and benefits in healthy nulliparous women and their infants, Journal of obstetrics and gynaecology Canada : JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC, 31, 808-817, 2009	Study included women with medical/obstetric indication for caesarean birth
Dahlquist, G. G., Patterson, C., Soltesz, G., Perinatal risk factors for childhood type 1 diabetes in Europe. The EURODIAB Substudy 2 Study Group, Diabetes care, 22, 1698-702, 1999	Emergency caesarean birth was included
Dahlquist,G., Kallen,B., Maternal-child blood group incompatibility and other perinatal events increase the risk for early-onset type 1 (insulin-dependent) diabetes mellitus, Diabetologia, 35, 671-675, 1992	Emergency caesarean birth was included
Davidson, Rebekah, Roberts, Stephen E., Wotton, Clare J., Goldacre, Michael J., Influence of maternal and perinatal factors on subsequent hospitalisation for asthma in children: evidence from the Oxford record linkage study, BMC pulmonary medicine, 10, 14, 2010	Emergency caesarean birth was included
Dean, Nicola, Wilson, Don, Herbison, Peter, Glazener, Cathryn, Aung, Thiri, Macarthur, Christine, Sexual function, delivery mode history, pelvic floor muscle exercises and incontinence: a cross-sectional study six years post-partum, The Australian & New Zealand journal of obstetrics & gynaecology, 48, 302-11, 2008	Emergency caesarean birth was included
Deen, K. I., Faecal incontinence after vaginal delivery, The Ceylon medical journal, 48, 1-3, 2003	Study conducted in a low/middle income country (Sri Lanka)
Deykin, E. Y., MacMahon, B., Pregnancy, delivery, and neonatal complications among autistic children, American journal of diseases of children (1960), 134, 860-4, 1980	Unavailable
Dolan, Lucia M., Hilton, Paul, Obstetric risk factors and pelvic floor dysfunction 20 years after first delivery, International urogynecology journal, 21, 535-44, 2010	Emergency caesarean birth was included
Eckerdal, P., Georgakis, M. K., Kollia, N., Wikstrom, A. K., Hogberg, U., Skalkidou, A., Delineating the association between mode of delivery and postpartum depression symptoms: a longitudinal study, Acta Obstetricia et Gynecologica Scandinavica, 97, 301-311, 2018	One systematic review (Xu 2017) assessing the risk of postpartum depression after CB comparing VB has been included and the results are in the same direction, therefore is not necessary to include this study
Effraimidis, N., Bladh, M., Josefsson, A., Akesson, K., Samuelsson, U., Cesarean section is associated to a small extent with an increased risk for type 1 diabetes in children and adolescents: A Swedish population-based registry study, Pediatric Diabetes, 15, 59, 2014	Study abstract

Study	Reason for Exclusion
Eftekhar,T., Hajibaratali,B., Ramezanzadeh,F., Shariat,M., Postpartum evaluation of stress urinary incontinence among primiparas, International Journal of Gynaecology and Obstetrics, 94, 114-118, 2006	Study did not adjust for confounders
Ekstrom, Asa, Altman, Daniel, Wiklund, Ingela, Larsson, Christina, Andolf, Ellika, Planned cesarean section versus planned vaginal delivery: comparison of lower urinary tract symptoms, International Urogynecology Journal and Pelvic Floor Dysfunction, 19, 459-65, 2008	No relevant time frame (minimum follow-up for urinary incontinence is 1 year, as per the review protocol)
Elenskaia, K., Thakar, R., Sultan, A., Scheer, I., Srivastava, R., Stress incontinence and childbirth: Results of a 5 year longitudinal study, Neurourology and Urodynamics, 30, 952-954, 2011	Study abstract
Falkert, A., Willmann, A., Endress, E., Meint, P., Seelbach-Gobel, B., Three-dimensional ultrasound of pelvic floor: is there a correlation with delivery mode and persisting pelvic floor disorders 18-24 months after first delivery?, Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology, 41, 204-9, 2013	Only tomographic ultrasound imaging was reported by group. Urinary incontinence symptoms were reported in combination for those who had a cesarean birth and a vaginal birth
Faridi, Andree, Willis, Stefan, Schelzig, Petra, Siggelkow, Wulf, Schumpelick, Volker, Rath, Werner, Anal sphincter injury during vaginal delivery--an argument for cesarean section on request?, Journal of Perinatal Medicine, 30, 379-87, 2002	Study did not adjust for confounders
Finegan, J. A., Quarrington, B., Pre-, peri-, and neonatal factors and infantile autism, Journal of child psychology and psychiatry, and allied disciplines, 20, 119-28, 1979	Study did not adjust for confounders
Flemming, Kelli, Woolcott, Christy G., Allen, Alexander C., Veugelers, Paul J., Kuhle, Stefan, The association between caesarean section and childhood obesity revisited: a cohort study, Archives of Disease in Childhood, 98, 526-32, 2013	Emergency caesarean birth was included
Fobelets, M., Beeckman, K., Buyl, R., Daly, D., Sinclair, M., Healy, P., Grylka-Baeschlin, S., Nicoletti, J., Gross, M. M., Morano, S., et al.,, Mode of birth and postnatal health-related quality of life after one previous cesarean in three European countries, Birth (Berkeley, Calif.), 45, 137â□□147, 2018	Inadequate lenght of fllow up (3 months)
Fritel, X., Khoshnood, B., Fauconnier, A., Four years after first delivery, do urinary incontinence and anal incontinence share same obstetrical risk factors?, Neurourology and Urodynamics, 28, 902-903, 2009	Conference abstract
Fritel, X., Morel, K., Quiboeuf, E., Fauconnier, A., Urinary incontinence 12 years after first	Study abstract

Study	Reason for Exclusion
childbirth in a cohort of 235 women, Neurourology and Urodynamics, 28, 904, 2009	
Fritel, Xavier, Ringa, Virginie, Varnoux, Noelle, Zins, Marie, Breart, Gerard, Mode of delivery and fecal incontinence at midlife: a study of 2,640 women in the Gazel cohort, Obstetrics and Gynecology, 110, 31-8, 2007	Study did not adjust for confounders
Fritel,X., Fauconnier,A., Levet,C., Benifla,J.L., Stress urinary incontinence 4 years after the first delivery: a retrospective cohort survey, Acta Obstetricia et Gynecologica Scandinavica, 83, 941-945, 2004	Emergency caesarean birth was included
Fritel,X., Schaal,J.P., Fauconnier,A., Bertrand,V., Levet,C., Pigne,A., Pelvic floor disorders 4 years after first delivery: a comparative study of restrictive versus systematic episiotomy, BJOG: An International Journal of Obstetrics and Gynaecology, 115, 247-252, 2008	Emergency caesarean birth was included
Garthus-Niegel, Susan, von Soest, Tilmann, Knoph, Cecilie, Simonsen, Tone Breines, Torgersen, Leila, Eberhard-Gran, Malin, The influence of women's preferences and actual mode of delivery on post-traumatic stress symptoms following childbirth: a population-based, longitudinal study, BMC Pregnancy and Childbirth, 14, 191, 2014	No exposure of interest
Gartland, D., MacArthur, C., Woolhouse, H., McDonald, E., Brown, S. J., Frequency, severity and risk factors for urinary and faecal incontinence at 4 years postpartum: a prospective cohort, BJOG : an international journal of obstetrics and gynaecology, 123, 1203-11, 2016	Emergency caesarean birth was included
Gartland,D., Donath,S., MacArthur,C., Brown,S.J., The onset, recurrence and associated obstetric risk factors for urinary incontinence in the first 18 months after a first birth: An Australian nulliparous cohort study, BJOG: An International Journal of Obstetrics and Gynaecology, 119, 1361-1369, 2012	No relevant time frame (minimum follow-up for urinary incontinence is 1 year, as per the review protocol)
Glasson, Emma J., Bower, Carol, Petterson, Beverly, de Klerk, Nick, Chaney, Gervase, Hallmayer, Joachim F., Perinatal factors and the development of autism: a population study, Archives of general psychiatry, 61, 618-27, 2004	Emergency caesarean birth was included
Goker,A., Yanikkerem,E., Demet,M.M., Dikayak,S., Yildirim,Y., Koyuncu,F.M., Postpartum depression: is mode of delivery a risk factor?, ISRN Obstetrics and Gynecology, 2012, 616759-, 2012	No relevant outcomes were reported
Goldberg, Roger P., Kwon, Christina, Gandhi, Sanjay, Atkuru, Laxmi V., Sorensen, Mark, Sand, Peter K., Prevalence of anal incontinence among mothers of multiples and analysis of risk	Multiple pregnancy

Study	Reason for Exclusion
factors, American Journal of Obstetrics and Gynecology, 189, 1627-1, 2003	
Gopinath, Bamini, Baur, Louise A., Burlutsky, George, Robaei, Dana, Mitchell, Paul, Socio-economic, familial and perinatal factors associated with obesity in Sydney schoolchildren, Journal of Paediatrics and Child Health, 48, 44-51, 2012	Emergency caesarean birth was included
Greenwood,C., Yudkin,P., Sellers,S., Impey,L., Doyle,P., Why is there a modifying effect of gestational age on risk factors for cerebral palsy?, Archives of Disease in Childhood Fetal and Neonatal Edition, 90, F141-F146, 2005	Emergency caesarean birth was included
Gregory, Simon G., Anthopolos, Rebecca, Osgood, Claire E., Grotegut, Chad A., Miranda, Marie Lynn, Association of autism with induced or augmented childbirth in North Carolina Birth Record (1990-1998) and Education Research (1997-2007) databases, JAMA pediatrics, 167, 959-66, 2013	Emergency caesarean birth was included
Gross, R., Is cesarean section associated with risk for autism spectrum disorder?, European Neuropsychopharmacology, 27, S749, 2017	Study abstract
Groutz, Asnat, Rimon, Eli, Peled, Simona, Gold, Ronen, Pauzner, David, Lessing, Joseph B., Gordon, David, Cesarean section: does it really prevent the development of postpartum stress urinary incontinence? A prospective study of 363 women one year after their first delivery, Neurourology and Urodynamics, 23, 2-6, 2004	Study did not adjust for confounders
Groutz,A., Fait,G., Lessing,J.B., David,M.P., Wolman,I., Jaffa,A., Gordon,D., Incidence and obstetric risk factors of postpartum anal incontinence, Scandinavian Journal of Gastroenterology, 34, 315-318, 1999	Study did not adjust for confounders
Gyhagen, M., Bullarbo, M., Nielsen, T. F., Milsom, I., Prevalence and risk factors for pelvic organ prolapse 20 years after childbirth: a national cohort study in singleton primiparae after vaginal or caesarean delivery, BJOG: An International Journal of Obstetrics & Gynaecology, 120, 152-60, 2013	No relevant outcome (pelvic organ prolapse)
Gyhagen, M., Bullarbo, M., Nielsen, T. F., Milsom, I., The prevalence of urinary incontinence 20 years after childbirth: a national cohort study in singleton primiparae after vaginal or caesarean delivery, BJOG: An International Journal of Obstetrics & Gynaecology, 120, 144-51, 2013	Emergency caesarean birth was included
Gyhagen, M., Bullarbo, M., Nielsen, T., Milsom, I., A comparison of the long-term consequences of vaginal delivery versus caesarean section on the prevalence, severity and bothersomeness of urinary incontinence subtypes: A national cohort study in primiparous women, BJOG: An	Emergency caesarean birth was included

Study	Reason for Exclusion
International Journal of Obstetrics and Gynaecology, 2013	
Gyhagen, Maria, Akervall, Sigvard, Milsom, Ian, Clustering of pelvic floor disorders 20 years after one vaginal or one cesarean birth, International Urogynecology Journal, 26, 1115-21, 2015	Emergency caesarean birth was included
Gyhagen, Maria, Akervall, Sigvard, Molin, Mattias, Milsom, Ian, The effect of childbirth on urinary incontinence: a matched cohort study in women aged 40-64 years, American Journal of Obstetrics and Gynecology, 2019	Emergency caesarean birth was included
Gyhagen, Maria, Bullarbo, Maria, Nielsen, Thorkild F., Milsom, Ian, Faecal incontinence 20 years after one birth: a comparison between vaginal delivery and caesarean section, International Urogynecology Journal, 25, 1411-8, 2014	Emergency caesarean birth was included
Handa, Victoria L., Pierce, Christopher B., Munoz, Alvaro, Blomquist, Joan L., Longitudinal changes in overactive bladder and stress incontinence among parous women, Neurourology and Urodynamics, 34, 356-61, 2015	Emergency caesarean birth was included
Hannah, M. E., Whyte, H., Hannah, W. J., Hewson, S., Amankwah, K., Cheng, M., Gafni, A., Guselle, P., Helewa, M., Hodnett, E. D., et al.,, Maternal outcomes at 2 years after planned cesarean section versus planned vaginal birth for breech presentation at term: the international randomized Term Breech Trial, American Journal of Obstetrics and Gynecology, 191, 917â□□927, 2004	Study included women undergoing caesarean birth for medical indication (breech presentation)
Hanrahan, M. T., Gibson, L., McCarthy, F., Khashan, A., The association between caesarean-section and childhood cognitive ability in the UK millennium cohort study, Reproductive Sciences, 26, 96A, 2019	Study abstract
Hantoushzadeh, Sedighgeh, Javadian, Pouya, Shariat, Mamak, Salmanian, Bahram, Ghazizadeh, Shirin, Aghssa, Malekmansour, Stress urinary incontinence: pre-pregnancy history and effects of mode of delivery on its postpartum persistency, International Urogynecology Journal, 22, 651-5, 2011	Study conducted in a low/ middle income country (Iran)
Herrmann, Viviane, Scarpa, Katia, Palma, Paulo Cesar Rodrigues, Riccetto, Cassio Zanettini, Stress urinary incontinence 3 years after pregnancy: correlation to mode of delivery and parity, International Urogynecology Journal and Pelvic Floor Dysfunction, 20, 281-8, 2009	Study conducted in a low/ middle income country (Brazil)
Hilde, Gunvor, Staer-Jensen, Jette, Siafarikas, Franziska, Engh, Marie Ellstrom, Braekken, Ingeborg Hoff, Bo, Kari, Impact of childbirth and mode of delivery on vaginal resting pressure and on pelvic floor muscle strength and endurance,	No relevant time frame (minimum follow-up for urinary incontinence is 1 year, as per the review protocol)

Study	Reason for Exclusion
American Journal of Obstetrics and Gynecology, 208, 50.e1-7, 2013	
Homer,C.S.E., Kurinczuk,J.J., Spark,P., Brocklehurst,P., Knight,M., Planned vaginal delivery or planned caesarean delivery in women with extreme obesity, BJOG: An International Journal of Obstetrics and Gynaecology, 118, 480-486, 2011	Study included women with medical/obstetric indication for caesarean birth
Huebner, Markus, Gramlich, Nathanja K., Rothmund, Ralf, Nappi, Luigi, Abele, Harald, Becker, Sven, Fecal incontinence after obstetric anal sphincter injuries, International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics, 121, 74-7, 2013	No expousure of interest
Huh, S. Y., Rifas-Shiman, S. L., Zera, C. A., Rich Edwards, J. W., Oken, E., Weiss, S. T., Gillman, M. W., Delivery by caesarean section and risk of obesity in preschool age children: a prospective cohort study, Archives of Disease in Childhood, 97, 610â□□616, 2012	No relevant outcome (obesity prior childhood)
Hultman, Christina M., Sparen, Par, Cnattingius, Sven, Perinatal risk factors for infantile autism, Epidemiology (Cambridge, Mass.), 13, 417-23, 2002	Emergency caesarean birth was included
Huser, Martin, Janku, Petr, Hudecek, Robert, Zbozinkova, Zuzana, Bursa, Miroslav, Unzeitig, Vit, Ventruba, Pavel, Pelvic floor dysfunction after vaginal and cesarean delivery among singleton primiparas, International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics, 137, 170-173, 2017	Study did not adjust for confounders
Hyakutake, M. T., Han, V., Baerg, L., Koenig, N. A., Cundiff, G. W., Lee, T., Geoffrion, R., Pregnancy-Associated Pelvic Floor Health Knowledge and Reduction of Symptoms: the PREPARED Randomized Controlled Trial, Journal of Obstetrics and Gynaecology Canada, 40, 418â□□425, 2018	No relevant expousure
Ievins, R., Roberts, S. E., Goldacre, M. J., Perinatal factors associated with subsequent diabetes mellitus in the child: record linkage study, Diabetic medicine : a journal of the British Diabetic Association, 24, 664-70, 2007	Study did not adjust the outcomes of interest for confounders
Jacob, Louis, Taskan, Sevil, Macharey, George, Sechet, Ingeborg, Ziller, Volker, Kostev, Karel, Impact of caesarean section on mode of delivery, pregnancy-induced and pregnancy-associated disorders, and complications in the subsequent pregnancy in Germany, German medical science : GMS e-journal, 14, Doc06, 2016	Study did not control for confounders
Johannessen, Hege Holmo, Stafne, Signe Nilssen, Falk, Ragnhild Sorum, Stordahl, Arvid, Wibe, Arne, Morkved, Siv, Prevalence and	Study did not adjust for confounders

Study	Reason for Exclusion
predictors of double incontinence 1 year after first delivery, International Urogynecology Journal, 29, 1529-1535, 2018	
Joyce, N. M., Tully, E., Kirkham, C., Dicker, P., Breathnach, F. M., Perinatal mortality or severe neonatal encephalopathy among normally formed singleton pregnancies according to obstetric risk status:" is low risk the new high risk?" A population-based cohort study, European Journal of Obstetrics and Gynecology and Reproductive Biology, 228, 71-75, 2018	Study did not adjust for confounders
Joyce, Niamh M., Tully, Elizabeth, Kirkham, Colin, Dicker, Patrick, Breathnach, Fionnuala M., Perinatal mortality or severe neonatal encephalopathy among normally formed singleton pregnancies according to obstetric risk status:" is low risk the new high risk?" A population-based cohort study, European journal of obstetrics, gynecology, and reproductive biology, 228, 71-75, 2018	No exposure of interest
Kaczmarczyk,M., Sparen,P., Terry,P., Cnattingius,S., Risk factors for uterine rupture and neonatal consequences of uterine rupture: a population-based study of successive pregnancies in Sweden, BJOG: An International Journal of Obstetrics and Gynaecology, 114, 1208-1214, 2007	Emergency caesarean birth was included
Kamara, M., Henderson, J. J., Doherty, D. A., Dickinson, J. E., Pennell, C. E., The risk of placenta accreta following primary elective caesarean delivery: a case-control study, BJOG: An International Journal of Obstetrics & Gynaecology, 120, 879-86, 2013	Women had a previous pregnancy complicated by placenta praevia, which may overestimate the rate of placenta accreta in the following pregnancy
Kazemirad, N. L. S., The effect of caesarian section in preventing postpartum stress urinary incontinence in primiparous women after one year of delivery, Research Journal of Obstetrics and Gynecology, 2, 1-5, 2009	Study was conducted in a low/middle income country (Iran)
Koc, Onder, Duran, Bulent, Ozdemirci, Safak, Bakar, Yesim, Ozengin, Nuriye, Is cesarean section a real panacea to prevent pelvic organ disorders?, International Urogynecology Journal, 22, 1135-41, 2011	Study developed in a low/ middle income country (Turkey)
Kokabi, Roya, Yazdanpanah, Dorna, Effects of delivery mode and sociodemographic factors on postpartum stress urinary incontinency in primipara women: A prospective cohort study, Journal of the Chinese Medical Association : JCMA, 80, 498-502, 2017	Study conducted in a low/ middle income country (Iran)
Kurt, S., Canda, M. T., Bal, M., Tasyurt, A., Are there any preventable risk factors for women who had surgery for pelvic organ prolapse and stress urinary incontinence?, Pakistan Journal of Medical Sciences, 34, 874-878, 2018	Study conducted in a low/ middle income country (Turkey)
Langridge, Amanda T., Glasson, Emma J., Nassar, Natasha, Jacoby, Peter, Pennell, Craig,	Some of the women who were included had pre-term births (% was not specified)

Study	Reason for Exclusion
Hagan, Ronald, Bourke, Jenny, Leonard, Helen, Stanley, Fiona J., Maternal conditions and perinatal characteristics associated with autism spectrum disorder and intellectual disability, Plos One, 8, e50963, 2013	
Larsson, Charlotta, Hedberg, Charlotta Linder, Lundgren, Ewa, Soderstrom, Lars, TunOn, Katarina, Nordin, Par, Anal incontinence after caesarean and vaginal delivery in Sweden: a national population-based study, Lancet (London, England), 393, 1233-1239, 2019	Relevant outcomes were not adjusted for confounders
Leijonhufvud, Asa, Lundholm, Cecilia, Cnattingius, Sven, Granath, Fredrik, Andolf, Ellika, Altman, Daniel, Risks of stress urinary incontinence and pelvic organ prolapse surgery in relation to mode of childbirth, American Journal of Obstetrics and Gynecology, 204, 70.e1-7, 2011	Emergency caesarean birth was included
Leung, J. Y. Y., Li, A. M., Leung, G. M., Schooling, C. M., Mode of delivery and childhood hospitalizations for asthma and other wheezing disorders, Clinical and experimental allergy : journal of the British Society for Allergy and Clinical Immunology, 45, 1109-17, 2015	Emergency caesarean birth was included
Liang, C. C., Wu, M. P., Lin, S. J., Lin, Y. J., Chang, S. D., Wang, H. H., Clinical impact of and contributing factors to urinary incontinence in women 5 years after first delivery, International Urogynecology Journal and Pelvic Floor Dysfunction, 24, 99-104, 2013	Study conducted in a low/ middle income country (China)
Lipsmeyer, Melissa, Diaz, Eva, Sims, Clark, Cleves, Mario, Shankar, Kartik, Andres, A., Antenatal and Postnatal Factors Associated with Offspring Adiposity During the First Two Years of Life (FS18-08-19), Current Developments in Nutrition, 3, 2019	Study abstract
Lord, C., Schopler, E., Revicki, D., Sex differences in autism, Journal of Autism and Developmental Disorders, 12, 317-30, 1982	Study did not adjust for confounders
Lukacz,E.S., Lawrence,J.M., Contreras,R., Nager,C.W., Luber,K.M., Parity, mode of delivery, and pelvic floor disorders, Obstetrics and Gynecology, 107, 1253-1260, 2006	Emergency caesarean birth was included
Lycett, K., Juonala, M., Lau, T., Grobler, A., Kerr, J. A., Magnussen, C., Sabin, M. A., Burgner, D. P., Wake, M., Early clinical markers of overweight/obesity onset and resolution by adolescence: Longitudinal Study of Australian Children, Obesity Research and Clinical Practice, 13, 253, 2019	Study abstract
MacArthur, C., Bick, D. E., Keighley, M. R., Faecal incontinence after childbirth, British Journal of Obstetrics & Gynaecology, 104, 46-50, 1997	Study did not adjust for confounders
MacArthur, C., Wilson, D., Herbison, P., Lancashire, R. J., Hagen, S., Toozs-Hobson, P.,	Emergency caesarean birth was included

Study	Reason for Exclusion
Dean, N., Glazener, C., Faecal incontinence persisting after childbirth: A 12year longitudinal study, BJOG: An International Journal of Obstetrics and Gynaecology, 120, 169-178, 2013	
MacArthur, C., Wilson, D., Herbison, P., Lancashire, R. J., Hagen, S., Toozs-Hobson, P., Dean, N., Glazener, C., Urinary incontinence persisting after childbirth: Extent, delivery history, and effects in a 12-year longitudinal cohort study, BJOG: An International Journal of Obstetrics and Gynaecology, 123, 1022-1029, 2016	Emergency caesarean birth was included
MacArthur, C., Wilson, D., Herbison, P., Lancashire, R., Hagen, S., Toozs-Hobson, P., Dean, N., Glazener, C., Urinary incontinence persisting after childbirth: A 12 year longitudinal study, Neurourology and Urodynamics, 32, 845-847, 2013	This publication did not report results by type of caesarean birth
MacArthur, Christine, Glazener, Cathryn M. A., Wilson, P. Don, Lancashire, Robert J., Herbison, G. Peter, Grant, Adrian M., Persistent urinary incontinence and delivery mode history: a six-year longitudinal study, BJOG : an international journal of obstetrics and gynaecology, 113, 218-24, 2006	Emergency caesarean birth was included
Macarthur, Christine, Glazener, Charis, Lancashire, Robert, Herbison, Peter, Wilson, Don, Grant, Adrian, Faecal incontinence and mode of first and subsequent delivery: a six-year longitudinal study, BJOG : an international journal of obstetrics and gynaecology, 112, 1075-82, 2005	Study did not adjust for confounders
MacLennan, A. H., Taylor, A. W., Wilson, D. H., Wilson, D., The prevalence of pelvic floor disorders and their relationship to gender, age, parity and mode of delivery, BJOG : an international journal of obstetrics and gynaecology, 107, 1460-70, 2000	Study did not adjust for confounders
Magnus, Maria C., Haberg, Siri E., Stigum, Hein, Nafstad, Per, London, Stephanie J., Vangen, Siri, Nystad, Wenche, Delivery by Cesarean section and early childhood respiratory symptoms and disorders: the Norwegian mother and child cohort study, American Journal of Epidemiology, 174, 1275-85, 2011	Included in Huang 2015
Maimburg,R.D., Vaeth,M., Perinatal risk factors and infantile autism, Acta Psychiatrica Scandinavica, 114, 257-264, 2006	No relevant vaginal birth comparison group was included
Makhoul, J., Espaillat-Rijo, L. M., Tugbiyele, F., Quinones, J. N., Kjerulff, K. H., Smulian, J. C., The impact of route of delivery on urinary and fecal incontinence 18 months after a first delivery, American Journal of Obstetrics and Gynecology, 218, S115, 2018	Conference abstract

Study	Reason for Exclusion
Malcova, Hana, Sumnik, Zdenek, Drevinek, Pavel, Venhacova, Jitrenka, Lebl, Jan, Cinek, Ondrej, Absence of breast-feeding is associated with the risk of type 1 diabetes: a case-control study in a population with rapidly increasing incidence, European journal of pediatrics, 165, 114-9, 2006	Relevant outcomes were not adjusted for confounders
Mamun, Abdullah A., Sutharsan, Ratneswary, O'Callaghan, Michael, Williams, Gail, Najman, Jake, McIntyre, Harold David, Callaway, Leonie, Cesarean delivery and the long-term risk of offspring obesity, Obstetrics and Gynecology, 122, 1176-83, 2013	The study reports that they collected the data for elective CB separately, however results for this group are not shown
Mason-Brothers, A., Ritvo, E. R., Pingree, C., Petersen, P. B., Jenson, W. R., McMahon, W. M., Freeman, B. J., Jorde, L. B., Spencer, M. J., Mo, A., The UCLA-University of Utah epidemiologic survey of autism: prenatal, perinatal, and postnatal factors, Pediatrics, 86, 514-9, 1990	Study did not adjust for confounders
McKinney,P.A., Parslow,R., Gurney,K., Law,G., Bodansky,H.J., Williams,D.R., Antenatal risk factors for childhood diabetes mellitus; a case-control study of medical record data in Yorkshire, UK, Diabetologia, 40, 933-939, 1997	Study did not adjust for confounders
McKinnie, V., Swift, S. E., Wang, W., Woodman, P., O'Boyle, A., Kahn, M., Valley, M., Bland, D., Schaffer, J., Partridge, J. R., The effect of pregnancy and mode of delivery on the prevalence of urinary and fecal incontinence, American Journal of Obstetrics and Gynecology, 193, 512-518, 2005	No relevant caesarean birth comparison group was included
Melville, Jennifer L., Fan, Ming-Yu, Newton, Katherine, Fenner, Dee, Fecal incontinence in US women: a population-based study, American Journal of Obstetrics and Gynecology, 193, 2071-6, 2005	Follow up was not reported, therefore it was not clear whether the study met the 1 year minimum follow up criteria stated in the protocol for fecal incontinence
Mueller, N. T., Rifas, S. L., Chavarro, J., Oken, E., Hivert, M. F., Associations of delivery mode and labor with measures of childhood adiposity: Findings from Project Viva, FASEB Journal, 31, 2017	Study abstract
Mueller, Noel T., Zhang, Mingyu, Hoyo, Cathrine, Ostbye, Truls, Benjamin-Neelon, Sara E., Does cesarean delivery impact infant weight gain and adiposity over the first year of life?, International journal of obesity (2005), 43, 1549-1555, 2019	Emergency caesarean birth was included
Nordenstam, Johan, Altman, Daniel, Brismar, Sophia, Zetterstrom, Jan, Natural progression of anal incontinence after childbirth, International Urogynecology Journal and Pelvic Floor Dysfunction, 20, 1029-35, 2009	Study did not adjust for confounders
O'Callaghan, Michael E., MacLennan, Alastair H., Gibson, Catherine S., McMichael, Gai L., Haan, Eric A., Broadbent, Jessica L., Goldwater,	Study did not adjust for confounders

Study	Reason for Exclusion
Paul N., Dekker, Gustaaf A., Australian Collaborative Cerebral Palsy Research, Group, Epidemiologic associations with cerebral palsy, Obstetrics and gynecology, 118, 576-82, 2011	
Patterson, C. C., Carson, D. J., Hadden, D. R., Waugh, N. R., Cole, S. K., A case-control investigation of perinatal risk factors for childhood IDDM in Northern Ireland and Scotland, Diabetes Care, 17, 376-81, 1994	No relevant vaginal birth group
Pei, Z., Heinrich, J., Fuertes, E., Flexeder, C., Hoffmann, B., Lehmann, I., Schaaf, B., Von Berg, A., Koletzko, S., Cesarean delivery and risk of childhood obesity, Journal of Pediatrics, 164, 1068-1073.e2, 2014	Emergency caesarean birth was included
Pinta, T. M., Kylanpaa, M. L., Teramo, K. A. W., Luukkonen, P. S., Sphincter rupture and anal incontinence after first vaginal delivery, Acta Obstetricia et Gynecologica Scandinavica, 83, 917-922, 2004	Study did not adjust for confounders
Polo-Kantola, Paivi, Lampi, Katja M., Hinkka-Yli-Salomaki, Susanna, Gissler, Mika, Brown, Alan S., Sourander, Andre, Obstetric risk factors and autism spectrum disorders in Finland, The Journal of pediatrics, 164, 358-65, 2014	No relevant study design; registry-based case-control study
Rami, B., Schneider, U., Imhof, A., Waldhor, T., Schober, E., Risk factors for type I diabetes mellitus in children in Austria, European Journal of Pediatrics, 158, 362-6, 1999	Study did not adjust for confounders
Reddy, Uma M., Laughon, S. Katherine, Sun, Liping, Troendle, James, Willinger, Marian, Zhang, Jun, Prepregnancy risk factors for antepartum stillbirth in the United States, Obstetrics and Gynecology, 116, 1119-26, 2010	No relevant population; study combined women in whom it was not clear whether they have had a previous caesarean birth and those who had a vaginal birth
Robertson, Lynn, Harrild, Kirsten, Maternal and neonatal risk factors for childhood type 1 diabetes: a matched case-control study, BMC Public Health, 10, 281, 2010	Study reported unadjusted estimates for the relevant reported outcomes
Robson, Stephen J., de Costa, Caroline, Woods, Cindy, Ding, Pauline, Rane, Ajay, Maternal-choice caesarean section versus planned vaginal birth in low-risk primigravid women, The Australian & New Zealand journal of obstetrics & gynaecology, 58, 469-473, 2018	Study did not adjust for confounders
Rogers, R. G., Leeman, L. M., Borders, N., Qualls, C., Fullilove, A. M., Teaf, D., Hall, R. J., Bedrick, E., Albers, L. L., Contribution of the second stage of labour to pelvic floor dysfunction: a prospective cohort comparison of nulliparous women, BJOG: An International Journal of Obstetrics & Gynaecology, 121, 1145-53; discussion 1154, 2014	No relevant time frame (minimum follow-up for urinary incontinence is 1 year, as per the review protocol)
Rooney, Brenda L., Mathiason, Michelle A., Schauberger, Charles W., Predictors of obesity in childhood, adolescence, and adulthood in a birth cohort, Maternal and Child Health Journal, 15, 1166-75, 2011	Emergency caesarean birth was included

Study	Reason for Exclusion
Rortveit, G., Daltveit, A. K., Hannestad, Y. S., Hunskaar, S., Urinary incontinence after vaginal delivery or cesarean section, New England Journal of Medicine, 348, 900-907, 2003	Study included any type of caesarean birth (elective and emergency procedures)
Rusconi, F., Zugna, D., Annesi-Maesano, I., Baiz, N., Barros, H., Correia, S., Duijts, L., Forastiere, F., Inskip, H., Kelleher, C. C., Larsen, P. S., Mommers, M., Andersen, A. M. N., Penders, J., Pike, K., Porta, D., Sonnenschein-Van Der Voort, A., Sunyer, J., Torrent, M., Viljoen, K., Vrijheid, M., Richiardi, L., Galassi, C., Mode of delivery and asthma at school age in nine European birth cohorts, European Respiratory Journal, 48, 2016	Same study as Rusconi 2017
Salihu, Hamisu M., Sharma, Puza P., Kristensen, Sibylle, Blot, Cassandra, Alio, Amina P., Ananth, Cande V., Kirby, Russell S., Risk of stillbirth following a cesarean delivery: black-white disparity, Obstetrics and Gynecology, 107, 383-90, 2006	Some of the women who were included had pre-term births (% was not specified)
Samarasekera, D. N., Bekhit, M. T., Wright, Y., Lowndes, R. H., Stanley, K. P., Preston, J. P., Preston, P., Speakman, C. T. M., Long-term anal continence and quality of life following postpartum anal sphincter injury, Colorectal disease : the official journal of the Association of Coloproctology of Great Britain and Ireland, 10, 793-9, 2008	Study did not adjust for confoudners
Samarasekera,D.N., Bekhit,M.T., Preston,J.P., Speakman,C.T.M., Risk factors for anal sphincter disruption during child birth, Langenbeck's Archives of Surgery, 394, 535-538, 2009	Study did not adjust for confounding
Sangalli,M.R., Floris,L., Faltin,D., Weil,A., Anal incontinence in women with third or fourth degree perineal tears and subsequent vaginal deliveries, Australian and New Zealand Journal of Obstetrics and Gynaecology, 40, 244-248, 2000	Study did not adjust for confounders
Sargent, J., Dissanayake, M. V., Skeith, A. E., Caughey, A. B., The impact of previous route of delivery on subsequent birth outcomes: Comparing one previous cesarean and one previous vaginal delivery with two previous cesareans, American Journal of Obstetrics and Gynecology, 218, S450, 2018	Conference abstract
Schei, Berit, Johannessen, Hege Holmo, Rydning, Astrid, Sultan, Abdul, Morkved, Siv, Anal incontinence after vaginal delivery or cesarean section, Acta Obstetricia et Gynecologica Scandinavica, 98, 51-60, 2019	Emergency caesarean birth was included
Schytt, Erica, Lindmark, Gunilla, Waldenstrom, Ulla, Symptoms of stress incontinence 1 year after childbirth: prevalence and predictors in a national Swedish sample, Acta Obstetricia et Gynecologica Scandinavica, 83, 928-36, 2004	Emergency caesarean birth was included

Study	Reason for Exclusion
Sevelsted, A., Stokholm, J., Bonnelykke, K., Bisgaard, H., The risk of childhood asthma varies by type of cesarean section: A Danish population-based register study, Allergy: European Journal of Allergy and Clinical Immunology, 69, 229, 2014	Conference abstract
Sipetic, Sandra B., Vlajinac, Hristina D., Kocev, Nikola I., Marinkovic, Jelena M., Radmanovic, Slobodan Z., Bjekic, Milan D., The Belgrade childhood diabetes study: a multivariate analysis of risk determinants for diabetes, European journal of public health, 15, 117-22, 2005	No relevant population; study did not compare vaginal birth with caesarean birth
Spong, Catherine Y., Landon, Mark B., Gilbert, Sharon, Rouse, Dwight J., Leveno, Kenneth J., Varner, Michael W., Moawad, Atef H., Simhan, Hyagriv N., Harper, Margaret, Wapner, Ronald J., Sorokin, Yoram, Miodovnik, Menachem, Carpenter, Marshall, Peaceman, Alan M., O'Sullivan, Mary J., Sibai, Baha M., Langer, Oded, Thorp, John M., Ramin, Susan M., Mercer, Brian M., National Institute of Child, Health, Human Development Maternal-Fetal Medicine Units, Network, Risk of uterine rupture and adverse perinatal outcome at term after cesarean delivery, Obstetrics and Gynecology, 110, 801-7, 2007	No relevant VB group
Stelmach, Tiina, Pisarev, Heti, Talvik, Tiina, Ante- and perinatal factors for cerebral palsy: case-control study in Estonia, Journal of child neurology, 20, 654-60, 2005	No relevant vaginal birth comparison group was included
Steur, Marinka, Smit, Henriette A., Schipper, C. Maarten A., Scholtens, Salome, Kerkhof, Marjan, de Jongste, Johan C., Haveman-Nies, Annemien, Brunekreef, Bert, Wijga, Alet H., Predicting the risk of newborn children to become overweight later in childhood: the PIAMA birth cohort study, International journal of pediatric obesity : IJPO : an official journal of the International Association for the Study of Obesity, 6, e170-8, 2011	Study did not adjust for confounders
Svensson, Jannet, Carstensen, Bendix, Mortensen, Henrik B., Borch-Johnsen, Knut, Danish Study Group of Childhood, Diabetes, Early childhood risk factors associated with type 1 diabetes--is gender important?, European journal of epidemiology, 20, 429-34, 2005	No relevant vaginal birth comparison group was included
Sword, W., Kurtz Landy, C., Thabane, L., Watt, S., Krueger, P., Farine, D., Fosterc, G., Is mode of delivery associated with postpartum depression at 6 weeks: A prospective cohort study, BJOG: An International Journal of Obstetrics and Gynaecology, 118, 966-977, 2011	Emergency caesarean birth was included
Tahtinen, R. M., Cartwright, R., Vernooij, R. W. M., Rortveit, G., Hunskaar, S., Guyatt, G. H., Tikkinen, K. A. O., Long-term risks of stress and	No relevant caesarean birth comparison group

Study	Reason for Exclusion
urgency urinary incontinence after different vaginal delivery modes, American Journal of Obstetrics and Gynecology, 220, 181, 2019	
Tenconi, M. T., Devoti, G., Comelli, M., Pinon, M., Capocchiano, A., Calcaterra, V., Pretti, G., Pavia, T. D. M. Registry Group, Major childhood infectious diseases and other determinants associated with type 1 diabetes: a case-control study, Acta diabetologica, 44, 14-9, 2007	No relevant population; study did not compare vaginal birth with caesarean birth
Thorngren-Jerneck, Kristina, Herbst, Andreas, Perinatal factors associated with cerebral palsy in children born in Sweden, Obstetrics and Gynecology, 108, 1499-505, 2006	The control group were children without a diagnosis of cerebral palsy (no relevant vaginal birth group)
Tollanes, Mette C., Moster, Dag, Daltveit, Anne K., Irgens, Lorentz M., Cesarean section and risk of severe childhood asthma: a population-based cohort study, The Journal of pediatrics, 153, 112-6, 2008	Included in Huang 2015
van Brummen, Henriette J., Bruinse, Hein W., van de Pol, Geerte, Heintz, A. Peter M., van der Vaart, C. Huub, Bothersome lower urinary tract symptoms 1 year after first delivery: prevalence and the effect of childbirth, BJU International, 98, 89-95, 2006	Results were reported for caesarean birth and vaginal birth as a whole
van Brummen, Henriette Jorien, Bruinse, Hein W., van de Pol, Geerte, Heintz, A. Peter M., van der Vaart, C. Huub, The effect of vaginal and cesarean delivery on lower urinary tract symptoms: what makes the difference?, International Urogynecology Journal and Pelvic Floor Dysfunction, 18, 133-9, 2007	No relevant time frame (minimum follow-up for urinary incontinence is 1 year, as per the review protocol)
van den Berg, A., van Elburg, R. M., van Geijn, H. P., Fetter, W. P., Neonatal respiratory morbidity following elective caesarean section in term infants. A 5-year retrospective study and a review of the literature, European journal of obstetrics, gynecology, and reproductive biology, 98, 9-13, 2001	Study did not adjust for confounders
Varma, Madhulika G., Brown, Jeanette S., Creasman, Jennifer M., Thom, David H., Van Den Eeden, Stephen K., Beattie, Mary S., Subak, Leslee L., Reproductive Risks for Incontinence Study at Kaiser Research, Group, Fecal incontinence in females older than aged 40 years: who is at risk?, Diseases of the colon and rectum, 49, 841-51, 2006	No relevant population; study did not compare vaginal birth with caesarean birth
Varma,A., Gunn,J., Gardiner,A., Lindow,S.W., Duthie,G.S., Obstetric anal sphincter injury: prospective evaluation of incidence, Diseases of the Colon and Rectum, 42, 1537-1543, 1999	Study did not adjust for confounders
Viktrup,L., Rortveit,G., Lose,G., Risk of stress urinary incontinence twelve years after the first pregnancy and delivery, Obstetrics and Gynecology, 108, 248-254, 2006	Relevant outcomes were not adjusted for confounders
Visalli, N., Sebastiani, L., Adorisio, E., Conte, A., De Cicco, A. L., D'Elia, R., Manfrini, S., Pozzilli,	No relevant population; study did not compare vaginal birth with caesarean birth

Study	Reason for Exclusion
P., Imdiab Group, Environmental risk factors for type 1 diabetes in Rome and province, Archives of disease in childhood, 88, 695-8, 2003	
Wang, Liang, Alamian, Arsham, Southerland, Jodi, Wang, Kesheng, Anderson, James, Stevens, Marc, Cesarean section and the risk of overweight in grade 6 children, European Journal of Pediatrics, 172, 1341-7, 2013	Emergency caesarean birth was included
Weng, Stephen F., Redsell, Sarah A., Nathan, Dilip, Swift, Judy A., Yang, Min, Glazebrook, Cris, Estimating overweight risk in childhood from predictors during infancy, Pediatrics, 132, e414-21, 2013	No relevant population; study did not compare vaginal birth with caesarean birth
Wickramasinghe, D. P., Senaratne, S., Senanayake, H., Samarasekera, D. N., Effect of vaginal delivery on anal sphincter function in Asian primigravida: a prospective study, International Urogynecology Journal, 27, 1375-1381, 2016	Study conducted in a low/ middle income country (Sri Lanka)
Woolhouse, Hannah, Perlen, Susan, Gartland, Deirdre, Brown, Stephanie J., Physical health and recovery in the first 18 months postpartum: does cesarean section reduce long-term morbidity?, Birth (Berkeley, Calif.), 39, 221-9, 2012	Emergency caesarean birth was included
Yuan, Changzheng, Gaskins, Audrey J., Blaine, Arianna I., Zhang, Cuilin, Gillman, Matthew W., Missmer, Stacey A., Field, Alison E., Chavarro, Jorge E., Association Between Cesarean Birth and Risk of Obesity in Offspring in Childhood, Adolescence, and Early Adulthood, JAMA Pediatrics, 170, e162385, 2016	Emergency caesarean birth was included
Zadzinska, Elzbieta, Rosset, Iwona, Pre-natal and perinatal factors affecting body mass index in pre-pubertal Polish children, Annals of Human Biology, 40, 477-84, 2013	Relevant outcomes were not adjusted for confounders
Zwart, J. J., Richters, J. M., Ory, F., de Vries, J. I. P., Bloemenkamp, K. W. M., van Roosmalen, J., Uterine rupture in The Netherlands: a nationwide population-based cohort study, BJOG : an international journal of obstetrics and gynaecology, 116, 1069-80, 2009	Study did not control for confounders

Economic studies

No economic evidence was identified for this review.

Appendix L – Research recommendations

Research recommendations for review question 1: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

No research recommendations were made for this review question.

Appendix M – Summary tables

Summary effect tables for maternal, infant and children outcomes of planned caesarean birth compared with planned vaginal birth

The tables below include both the raw event numbers in each arm across all studies included per outcome and the relative effect difference between the groups. The relative effect difference has been adjusted (to some extent) for potential confounders and therefore represents the more accurate estimate of the likely independent effect of choosing between planning for caesarean birth and for vaginal birth. The absolute effect (i.e. the expected increase or decrease in actual outcomes observed were all women to plan for caesarean birth as opposed to vaginal birth) has been calculated by applying the relative effect estimate to an appropriate control group (vaginal birth) risk. The absolute and relative effect columns are therefore the most meaningful, although the raw event numbers in the second and third columns are included for information.

Table 12: Maternal and infant short-term outcomes

Outcomes	Finding for elective caesarean birth *With event/total, unless otherwise specified*	Finding for planned vaginal birth *With event/total, unless otherwise specified*	Absolute effect	Relative effect (95% CI)	Evidence quality
Short-term outcomes for women and babies that may be more likely with a caesarean birth					
Peri-partum hysterectomy	56/35,170 (0.16%)	325/406,897 (0.08%)	65 more per 100000 (from 29 more to 112 more)	OR 1.81 (1.36 to 2.40)[a]	Low
Maternal death	25.6/100,000 (0.025%)	4.4/100,000 (0.004%)	19 more per 100000 (from 6 more to 46 more)	OR 5.63 (2.52 to 12.55)[a]	Low
Neonatal mortality	469/271,179 (0.17%)	4500/7,138,068 (0.06%)	80 more per 100000 (from 68 more to 95 more)	OR 2.34 (2.13 to 2.58)	Low
Short-term outcomes for women and babies that are likely to be the same for caesarean or vaginal birth					
Thromboembolic disease	7/35,170 (0.02%)	40/406,897 (0.01%)	9 more per 100000 (from 2 fewer to 32 more)	OR 1.87 (0.84 to 4.18)[a]	Very low
Haemorrhage related outcomes[¥]					

Outcomes	Finding for elective caesarean birth *With event/total, unless otherwise specified*	Finding for planned vaginal birth *With event/total, unless otherwise specified*	Absolute effect	Relative effect (95% CI)	Evidence quality
Major obstetric haemorrhage[b]	8/373 (2.1%)	90/6,299 (1.4%)	882 more per 100000 (from 350 fewer to 3556 more)	RR 1.63 (0.75 to 3.54)[a,c]	Very low
Bleeding complications[d]	579/5,877 (9.9%)	644/12,936 (5%)	6628 more per 100000 (from 4953 more to 8636 more)	OR 2.5 (2.1 to 3)	Very low
Postpartum haemorrhage[d]	390/35,170 (1.11%)	10253/406,897 (2.52%)	1395 fewer per 100000 (from 1522 fewer to 1294 fewer)	OR 0.44 (0.39 to 0.48)[a]	Very low
Admission to neonatal unit	16/373 (4.3%)	282/6,299 (4.5%)	630 fewer per 100000 (from 2250 fewer to 2160 more)	RR 0.86 (0.5 to 1.48) [a,c]	Very low
Infectious morbidity¥	4/373 (1.1%)	154/6,299 (2.4%)	1368 fewer per 100000 (from 2016 fewer to 456 more)	RR 0.43 (0.16 to 1.19)[a,c]	Very low
	29/5,877 (0.5%)	95/12,936 (0.7%)	209 fewer per 100000 (from 419 fewer to 0 more)	OR 0.7 (0.4 to 1)[d]	Very low
Short-term outcomes for women and babies that have conflicting or limited evidence about the risk with caesarean or vaginal birth					
Intensive treatment unit admission	1/373 (0.27%)	7/6,299 (0.1%)	13 more per 100000 (from 88 fewer to 964 more)	RR 1.13 (0.12 to 10.64)[a,c]	Very low
Respiratory morbidity¥					
Respiratory morbidity[e]	5/373 (1.3%)	82/6,299 (1.3%)	78 fewer per 100000 (from 832 fewer to 1898 more)	RR 0.94 (0.36 to 2.46)[a,c]	Very low
Respiratory distress syndrome[d]	159/5,877 (2.7%)	132/12,936 (1%)	1655 more per 100000 (from 786 more to 2930 more)	OR 2.7 (1.8 to 4.05)	Very low

CI: confidence interval; OR: odds ratio; RR: risk ratio
¥ Multiple rows with different results reported because the adjusted relative effects measures reported by the studies were different and not appropriate to meta-analyse
[a]All women were ≥35 years old
[b]Defined as ≥1500 ml of visually estimated blood loss within 24 hours postpartum
[c]Comparison group were women who had unassisted vaginal birth only
*[d]*No *definition was reported*
[e]Defined as transitory tachypnea, respiratory distress, meconium aspiration, use of respirator and continuous positive airway pressure

Table 13: Maternal and children long-term outcomes

Outcomes	Finding for elective caesarean birth *With event/total, unless otherwise specified*	Finding for planned vaginal birth *With event/total, unless otherwise specified*	Absolute effect	Relative effect (95% CI)	Evidence quality
Long-term outcomes for women and children that may be less likely with a caesarean birth					
Urinary incontinence >1 year postpartum					
Urinary incontinence >1 year postpartum (versus unassisted VB)	62/316 (19.6%)	1,160/2,177 (48.7%)	21178 fewer per 100000 (from 13990 fewer to 27113 fewer)	OR 0.40 (0.29 to 0.56)	Very low
Urinary incontinence >1 year postpartum (versus assisted VB)	14/192 (7.3%)	25/126 (19.8%)	14648 fewer per 100000 (from 9602 fewer to 17391 fewer)	OR 0.22 (0.10 to 0.46)	Low
Long-term outcomes for women and children that may be more likely with a caesarean birth					
Asthma	2,782,769 (total, n per group was NR)		309 more per 100000 (from 251 more to 368 more)[δ]	OR 1.21 (1.17 to 1.25)	Low
Childhood obesity[¥]	317/14,450 (2.2%)	4741/168,998 (2.8%)	358 more per 100000 (from 0 more to 742 more)	HR 1.13 (1 to 1.27)	Low
	120/2,176 (5.5%)	614/11,490 (5.3%)	848 more per 100000 (from 371 fewer to 2385 more)	RR 1.16 (0.93 to 1.45)[a]	Very low

Outcomes	Finding for elective caesarean birth *With event/total, unless otherwise specified*	Finding for planned vaginal birth *With event/total, unless otherwise specified*	Absolute effect	Relative effect (95% CI)	Evidence quality
Faecal incontinence occurring 1 or more years after the birth (compared to assisted VB)	15/192 (7.8%)	19/126 (15.1%)	7690 fewer per 100000 (from 776 fewer to 11499 fewer)	OR 0.45 (0.21 to 0.94)	Low
Placenta accreta in any future pregnancy	698,374 (total, n per group was NR)		57 more per 100000 (from 30 more to 96 more) δ	OR 2.43 (1.74 to 3.40)[b]	Very low
Uterine rupture in any future pregnancy	834,475 (total, n per group was NR)		982 more per 100000 (from 397 more to 2332 more) δ	OR 25.81 (10.97 to 60.71)[b]	Very low
Long-term outcomes for women and children that are likely to be the same for caesarean or vaginal birth					
Postnatal depression	13,221 (total, n per group was NR)		1041 more per 100000 (from 565 fewer to 2990 more)δ	OR 1.15 (0.92 to 1.44)	Very low
Faecal incontinence occurring 1 or more years after the birth (compared to unassisted VB)	28/316 (8.9%)	250/2177 (11.5%)	3053 fewer per 100000 (from 5860 fewer to 1106 more)	OR 0.71 (0.46 to 1.11)	Very low
Persistent verbal delay	19/846 (2.2%)	131/6,020 (2.2%)	492 more per 100000 (from 563 fewer to 2188 more)	OR 1.23 (0.74 to 2.04)[a]	Very low
Infant mortality (up to 1 year)	26/12,355 (0.21%)	384/252,917 (0.15%)	64 more per 100000 (from 7 fewer to 172 more)	HR 1.43 (0.95 to 2.15)	Very low
Outcomes for women and children that have conflicting or limited evidence about the risk with caesarean or vaginal birth					
Stillbirth in any subsequent pregnancy					

Outcomes	Finding for elective caesarean birth *With event/total, unless otherwise specified*	Finding for planned vaginal birth *With event/total, unless otherwise specified*	Absolute effect	Relative effect (95% CI)	Evidence quality
Stillbirth in any future pregnancy¥	972,134 (total, n per group was NR)		91 more per 100000 (from 34 more to 156 more) δ	OR 1.27 (1.10 to 1.46)[b]	Very low
Stillbirth in a second pregnancy¥	94,538 (total)	535,277 (total)	102 more per 100000 (from 24 fewer to 278 more)δ	HR 1.30 (0.93 to 1.82)[b]	Very low
Stillbirth in a subsequent pregnancy¥	9,287,701 (total, n per group was NR)		41 fewer per 100000 (from 58 fewer to 24 fewer)δ	RR 0.88 (0.83 to 0.93)[b]	Very low
Cerebral palsy	4/22 (18.2%)	72/271 (26.6%)	23783 fewer per 100000 (from 7773 fewer to 26239 fewer)	OR 0.08 (0.01 to 0.64)	Very low
Autism spectrum condition					
Autism spectrum condition¥	1957/244,799 (0.8%)	25843/4,322,061 (0.59%)	146 more per 100000 (from 94 more to 211 more)	OR 1.25 (1.16 to 1.36)[a]	Very low
	227,545 (total)	2,714,885 (total)	159 more per 100000 (from 70 more to 268 more)δ	HR 1.16 (1.07 to 1.27)	Very low
Autism spectrum condition¥; sibling control analysis	NR	NR	30 fewer per 1000 (from 169 fewer to 123 more)δ	HR 0.97 (0.83 to 1.13)	Very low
	NR	NR	109 fewer per 1000 (from 238 fewer to 40 more)δ	OR 0.89 (0.76 to 1.04)[a]	Very low
Type 1 diabetes					
Type 1 diabetes¥	154,498 (total)	2,094,481 (total)	74 more per 100000 (from 29 more to 123 more)δ	RR 1.15 (1.06 to 1.25)	Low

Outcomes	Finding for elective caesarean birth *With event/total, unless otherwise specified*	Finding for planned vaginal birth *With event/total, unless otherwise specified*	Absolute effect	Relative effect (95% CI)	Evidence quality
	375/135,144 (0.28%)	4847/1,750,529 (0.27%)	35 more per 100000 (from 0 more to 75 more)	HR 1.13 (1 to 1.28)	Low
Type 1 diabetes, sibling control analysis	2200 (total, n per group was NR)		29 more per 100000 (from 74 fewer to 157 more)[δ]	RR 1.06 (0.85 to 1.32)	Very low

CI: confidence interval; HR: hazard ratio; NR: not reported; OR: odds ratio; RR: risk ratio
[δ]Control group risk was not reported by the study. See appendix O for more information
[¥]Multiple rows with different results reported because the adjusted relative effects measures reported by the studies were different and not appropriate to meta-analyse
[a]Comparison group were women who had unassisted vaginal birth only
[b]Women in the intervention group had any type of caesarean birth (emergency and elective)

Appendix N – Additional studies

Additional studies for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

The following studies were not included in the review because the reported effect estimates did not substantially alter the overall estimate of included systematic reviews assessing the same outcome.

Table 14: Additional studies reporting on asthma

Study	Outcome definition	Intervention (with event/ total)	Comparison (with event/total)	Relative effect
Black 2015 Population-based retrospective data-linkage study UK	Asthma requiring hospital admission up to age 14	Planned caesarean birth 461/12,355	Vaginal birth 8,624/252,917	HR (95% CI) 1.22 (1.11 to 1.34)
Peters 2018 Retrospective data-linkage study Australia	Asthma diagnosis at age 5	Elective caesarean birth 1,868/55,499	Spontaneous vaginal birth 5,738/185,883	OR (95% CI) 1.04 (0.97 to 1.11)
Rusconi 2017 Population-based retrospective cohort study Denmark, France, Italy, The Netherlands, Portugal, Spain, Ireland, UK	Asthma - parental report at ages 5 to 9	Elective caesarean birth	Spontaneous vaginal birth	RR (95% CI) 1.33 (1.02 to 1.75)
		N=67,613, total number of participants per arm was not reported		
van Berkel 2015[a] Population-based prospective cohort study	Asthma diagnosis at age 6	Elective caesarean birth 18/249	Vaginal birth 216/3150	OR (95% CI) 0.89 (0.52 to 1.52)

Study	Outcome definition	Intervention (with event/ total)	Comparison (with event/total)	Relative effect
The Netherlands				

HR: hazard ratio; OR: odds ratio; RR: risk ratio; CI: confidence interval; no.: number
[a]There may be some overlap between the population included in van Berkel 2015 and Rusconi 2017. Rusconi 2017 included a cohort of children (2001 to 2006) from the Generation R study, and van Berkel 2015 based its study in a cohort of children from the Generation R study, but the year was not reported.

Table 15: Additional studies reporting on postnatal depression

Study	Outcome definition	Intervention (with event/total)	Control (with event/total)	Relative effect
Eckerdal 2018 Population-based prospective study Sweden	EPDS ≥12 at 6 weeks postpartum	Elective caesarean birth, 40/346	Vaginal birth 309/2872	OR (95% CI) 1.19 (0.73 to 1.92)

OR: odds ratio; EPDS: Edinburgh Postpartum Depression Scale; CI: confidence interval; no.: number

Appendix O – Additional control group risks

Additional control group risks for review question: What are the benefits and risks (short- and long-term) of planned caesarean birth compared with planned vaginal birth at term for women and neonates/infants/children?

The following control group risks were obtained from the literature because these were not reported by the original studies in order to calculate absolute effects.

Table 16: Additional control group risks obtained from the literature

Outcome	Control group risk used	Reference
Placenta accreta	0.04%	Jackson S, Fleege L, Fridman M, Gregory K, Zelop C, Olsen J. Morbidity following primary cesarean delivery in the Danish National Birth Cohort. American journal of obstetrics and gynecology. 2012 Feb 1;206(2):139-e1.
Uterine rupture	0.04%	Jackson S, Fleege L, Fridman M, Gregory K, Zelop C, Olsen J. Morbidity following primary cesarean delivery in the Danish National Birth Cohort. American journal of obstetrics and gynecology. 2012 Feb 1;206(2):139-e1.
Stillbirth (all outcomes)	0.34%	Kennare R, Tucker G, Heard A, Chan A. Risks of adverse outcomes in the next birth after a first cesarean delivery. Obstetrics & Gynecology. 2007 Feb 1;109(2):270-6.
Postnatal depression	7.60%	Sword W, Kurtz Landy C, Thabane L, Watt S, Krueger P, Farine D, Foster G. Is mode of delivery associated with postpartum depression at 6 weeks: a prospective cohort study. BJOG: An International Journal of Obstetrics & Gynaecology. 2011 Jul;118(8):966-77.
Asthma	1.50%	Almqvist C, Cnattingius S, Lichtenstein P, Lundholm C. The impact of birth mode of delivery on childhood asthma and allergic diseases–a sibling study. Clinical & Experimental Allergy. 2012 Sep;42(9):1369-76.
Type 1 diabetes (RR, sibling control analysis)	0.49%	Black M, Bhattacharya S, Philip S, Norman JE, McLernon DJ. Planned repeat cesarean section at term and adverse childhood health outcomes: a record-linkage study. PLoS medicine. 2016 Mar 15;13(3):e1001973.
Autism spectrum condition (HR, sibling control analysis)	1%	Curran EA, Dalman C, Kearney PM, Kenny LC, Cryan JF, Dinan TG, Khashan AS. Association between obstetric mode of delivery and autism spectrum disorder: a population-based sibling design study. JAMA psychiatry. 2015 Sep 1;72(9):935-42.

HR: hazard ratio; RR: risk ratio