Planned caesarean section for term breech delivery (Review)

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ABSTRACT

Background
Poor outcomes after breech birth might be the result of underlying conditions causing breech presentation or to factors associated with the delivery.

Objectives
To assess the effects of planned caesarean section for singleton breech presentation at term on measures of pregnancy outcome.

Search strategy
We searched the Cochrane Pregnancy and Childbirth Group trials register (October 2004) and the Cochrane Central Register of Controlled Trials (*The Cochrane Library,* Issue 3, 2004).

Selection criteria
Randomised trials comparing planned caesarean section for singleton breech presentation at term with planned vaginal birth.

Data collection and analysis
We assessed trial eligibility and quality. We extracted and analysed data using routine Cochrane Collaboration methodology.

Main results
Three trials (2396 participants) were included in the review.

Caesarean delivery occurred in 550/1227 (45%) of those women allocated to a vaginal delivery protocol. Perinatal or neonatal death (excluding fatal anomalies) or serious neonatal morbidity was reduced with planned caesarean section (relative risk (RR) 0.33, 95% confidence interval (CI) 0.19 to 0.56). This reduction was less for countries with high national perinatal mortality rates. Perinatal or neonatal death (excluding fatal anomalies) was also reduced with planned caesarean section (RR 0.29, 95% CI 0.10 to 0.86). The proportional reductions were similar for countries with low and high national perinatal mortality rates. Planned caesarean section was associated with modestly increased short-term maternal morbidity (RR 1.29, 95% CI 1.03 to 1.61). At three months after delivery, women allocated to the planned caesarean section group reported less urinary incontinence (RR 0.62, 95% CI 0.41 to 0.93); more abdominal pain (RR 1.89, 95% CI 1.29 to 2. 79); and less perineal pain (RR 0.32, 95% CI 0.18 to 0.58).

At two years, there were no differences in the combined outcome 'death or neurodevelopmental delay'. Maternal outcomes at 2 years were also similar.

Authors' conclusions
Planned caesarean section compared with planned vaginal birth reduced perinatal or neonatal death or serious neonatal morbidity, at the expense of somewhat increased maternal morbidity. The option of external cephalic version is dealt with in separate reviews. The data from this review cannot be generalised to settings where caesarean section is not readily available, or to methods of breech delivery that differ materially from the clinical delivery protocols used in the trials reviewed. The review will help to inform individualised decision-making regarding breech delivery. Research on strategies to improve the safety of breech delivery is needed.

PLAIN LANGUAGE SUMMARY

Planned caesarean section safer for singleton term breech babies than planned vaginal birth, managed according to a clinical protocol, but more complications for mothers

Most babies are born head first but some lie in the womb with their buttocks or feet coming first (breech). The review of studies showed that planned caesarean section was safer for the singleton breech baby at term than planned vaginal birth, managed according to a clinical protocol. However, mothers suffered more short-term complications and there was limited information about the potential for problems with future pregnancies.

BACKGROUND

The routine use of caesarean section for breech presentation became widespread prior to evidence from randomised trials that the benefits of such a policy outweighed the risks.

The interpretation of observational studies that compare outcome after vaginal breech birth and cephalic birth is confounded by the fact that breech presentation per se appears to be a marker for poor perinatal outcome. For example, the incidence of childhood handicap among singleton breech babies, born at term, has been found to be high (19.4%) and similar for those delivered following trial of labour and those following an elective caesarean section (Danielian 1996). Thus, poor outcomes following vaginal breech birth may be the result of underlying conditions causing breech presentation rather than damage during delivery. However, the care during labour, the delivery methods used, and skill of the birth attendant may also influence outcome.

Factors which have been associated with breech presentation include: nulliparity; previous breech birth; uterine anomaly; contracted pelvis; use of anticonvulsant drugs; placenta praevia; cornual placenta; decreased or increased amniotic fluid volume; extended fetal legs; multiple pregnancy; prematurity; short umbilical cord; decreased fetal activity; impaired fetal growth; fetal anomaly; and fetal death.

In a review of two randomised trials and seven cohort studies, the risk difference between trial of labour and planned caesarean section for any perinatal injury or death was 1.1% (Gifford 1995), findings similar to a previous review (Cheng 1993). However, cohort studies are fundamentally flawed by the fact that factors which influence the choice of method of delivery may have more to do with the outcome for the baby than the method of delivery.

For these reasons, information from randomised trials is required to determine whether benefits (if any) of routine caesarean section for the infant are sufficient to justify subjecting mothers to the increased current and future risks of caesarean section. Attention should be paid to the selection criteria for allowing a trial of labour and the skill and experience of the clinician at delivery.

OBJECTIVES

To assess, from the best available evidence, the effects on perinatal or neonatal death (excluding fatal anomalies) or serious neonatal morbidity, perinatal, neonatal, or infant death (excluding fatal anomalies) or disability in childhood, and maternal death or maternal morbidity, of a policy of routine versus selective caesarean delivery for term singleton breech presentation.

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

Types of studies

All comparisons of intention to perform caesarean section and intention to deliver vaginally, subject to a management protocol, for singleton breech presentation at term; random allocation to treatment and control groups, with adequate allocation concealment; violations of allocated management and exclusions after allocation not sufficient to materially affect outcomes.

Types of participants

Women with breech presentation considered suitable for vaginal delivery. Sub-group analysis was performed for countries with low (20 or less per 1000) and high (more than 20 per 1000) national perinatal mortality rates, as defined in the Term Breech Trial (Hannah 2000). This analysis was not specified in the original review protocol.

Types of intervention

Planned caesarean section compared with planned vaginal birth subject to the requirements of the clinical trial protocol.

Types of outcome measures

The list of outcome measures was developed in 2000 as a generic list for reviews of planned caesarean section for various indications. The list was revised in 2003 and 2004 to include additional measures of neonatal and maternal morbidity (marked * and ** respectively).

Primary

Perinatal or neonatal death (excluding fatal anomalies) or serious neonatal morbidity (e.g. seizures, birth asphyxia as defined by trial authors, neonatal encephalopathy, birth trauma);
perinatal, neonatal or infant death (excluding fatal anomalies) or disability in childhood;
maternal death or serious maternal morbidity (e.g. admission to intensive care unit, septicaemia, organ failure).

Secondary

Short-term perinatal/neonatal outcomes
perinatal/neonatal death (excluding fatal anomalies);
serious neonatal morbidity (e.g. seizures, birth asphyxia as defined by trial authors, neonatal encephalopathy, birth trauma);
Apgar score less than seven at 5 minutes;
*Apgar score less than four at 5 minutes;
cord blood pH less then 7.2;
*cord blood pH less than 7.0;
*base deficit at least 15;
neonatal intensive care unit admission;
neonatal encephalopathy, as defined by trial authors;
*birth trauma, as defined by trial authors;
brachial plexus injury.

Long-term infant outcomes (at two years)
death (excluding fatal anomalies);
disability in childhood, as defined by trial authors;
medical problems**

Short-term maternal outcomes
caesarean section;
regional analgesia;
general anaesthesia;
instrumental vaginal delivery;
death;
serious maternal morbidity (e.g. intensive care unit admission, septicaemia, organ failure);
postpartum haemorrhage (as defined by the trial authors);
postpartum anaemia, as defined by trial authors;
blood transfusion;
wound infection;
woman not satisfied with care.

Longer-term maternal outcomes (at three months)
breastfeeding failure, as defined by trial authors;
perineal pain;
abdominal pain;
backache or back pain;
any pain;
dyspareunia, as defined by trial authors;
uterovaginal prolapse;
urinary incontinence;
flatus incontinence;
faecal incontinence;
postnatal depression, as defined by trial authors;
postnatal self-esteem, as defined by trial authors;
postnatal anxiety, as defined by trial authors;
relationship with baby, as defined by trial authors;
relationship with partner, as defined by trial authors.

Long-term maternal outcomes (at two years)
breastfeeding failure, as defined by trial authors;
perineal pain;
abdominal pain;
backache or back pain;
any pain;
dyspareunia, as defined by trial authors;
uterovaginal prolapse;
urinary incontinence;
flatus incontinence;
faecal incontinence;
infertility;
subsequent pregnancy;
miscarriage or termination of a subsequent pregnancy;
caesarean section in a subsequent pregnancy;
uterine rupture in a subsequent pregnancy;
dysmenorrhoea;
menorrhagia;
postnatal depression, as defined by trial authors postnatal self-esteem, as defined by trial authors;
postnatal anxiety, as defined by trial authors;
relationship with child, as defined by trial authors;
relationship with partner, as defined by trial authors.

Health services
caregiver not satisfied;
cost.

Outcomes were included if clinically meaningful; reasonable measures had been taken to minimise observer bias; missing data were insufficient to materially influence conclusions; data were available for analysis according to original allocation, irrespective of protocol violations; data were available in a format suitable for analysis.

Only outcomes for which data were available have been included in the analysis tables.

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: methods used in reviews.

We searched the Cochrane Pregnancy and Childbirth Group trials register (October 2004).

The Cochrane Pregnancy and Childbirth Group's trials register is maintained by the Trials Search Co-ordinator and contains trials identified from:
1. quarterly searches of the Cochrane Central Register of Controlled Trials (CENTRAL);

2. monthly searches of MEDLINE;
3. handsearches of 30 journals and the proceedings of major conferences;
4. weekly current awareness search of a further 37 journals.

Details of the search strategies for CENTRAL and MEDLINE, the list of handsearched journals and conference proceedings, and the list of journals reviewed via the current awareness service can be found in the 'Search strategies for identification of studies' section within the editorial information about the Cochrane Pregnancy and Childbirth Group.

Trials identified through the searching activities described above are given a code (or codes) depending on the topic. The codes are linked to review topics. The Trials Search Co-ordinator searches the register for each review using these codes rather than keywords.

In addition, we searched the Cochrane Central Register of Controlled Trials (*The Cochrane Library*, Issue 3, 2004) using the term 'breech'.

METHODS OF THE REVIEW

Trials under consideration were evaluated for methodological quality and appropriateness for inclusion according to the pre-stated selection criteria, without consideration of their results. Individual outcome data were included in the analysis if they met the pre-stated criteria in 'Types of outcome measures'. Included trial data were processed as described in Clarke 2000.

Data were extracted from the sources and entered onto the Review Manager (RevMan) computer software (RevMan 2000), checked for accuracy, and analysed as above using the RevMan software. For dichotomous data, relative risks and 95% confidence intervals were calculated, and in the absence of heterogeneity, results were pooled using a fixed effect model. Continuous data were pooled using weighted mean differences and 95% confidence intervals.

DESCRIPTION OF STUDIES

See table of 'Characteristics of included studies'.

METHODOLOGICAL QUALITY

See table of 'Characteristics of included studies', particularly the 'Methods' and 'Notes' sections.

For all three studies included in this review, women were delivered in hospital. In two studies from the same unit, women with frank (Collea 1980) or non-frank (Gimovsky 1983) breech presentation were allocated 'by random selection' to a policy of elective caesarean section or a protocol allowing vaginal delivery within prescribed limitations including the absence of diminished pelvic dimensions on x-ray pelvimetry. The method of randomisation is not specified, and in the first study (Collea 1980) a large discrepancy in numbers between groups (93 versus 115 total, and 37 versus 57 multiparous women) is not accounted for. In other respects the studies are methodologically sound, and although some of the reported analyses are by actual method of delivery, the data presentation allows analysis according to primary allocation as presented in this review.

Exclusion of these two less methodologically sound trials does not change the conclusions of the review, except that the excess of maternal morbidity in the planned caesarean section group is no longer statistically significant.

The Term Breech Trial (Hannah 2000) was a large, international multi-centre trial comparing planned caesarean section with planned vaginal birth by an experienced clinician following agreed clinical guidelines, for the frank or complete breech presentation. The computerised randomisation system was controlled centrally. The data monitoring committee stopped the trial before the sample size of 2800 was reached because pre-defined criteria of benefit to the caesarean section group were met. The participating countries were classified as having low (20 per 1000 or less) or high (greater than 20 per 1000) national perinatal mortality rates. Women from centres able to ensure greater than 80% follow up were followed up at three months and at two-years.

RESULTS

Three trials with 2396 participants were included in the review.

Caesarean delivery occurred in 1060/1169 (91%) of those women allocated to planned caesarean section, and 550/1227 (45%) of those allocated to a vaginal delivery protocol. Perinatal or neonatal death (excluding fatal anomalies) or short-term neonatal morbidity was reduced overall with a policy of planned caesarean section (relative risk (RR) 0.33, 95% confidence interval (CI) 0.19 to 0.56). Perinatal or neonatal death (excluding fatal anomalies) or short-term neonatal morbidity was also reduced in the Term Breech Trial (Hannah 2000; RR 0.33, 95% confidence interval (CI) 0.19 to 0.56), and in this trial neonatal morbidity was defined as serious. The outcomes of neonatal morbidity are not as clearly documented in the study of Gimovsky et al (Gimovsky 1983). The reduction in risk of perinatal or neonatal death or short-term neonatal morbidity was less for countries with high national perinatal mortality rates (see 'Discussion'). For the latter subgroup, the numbers were inadequate to evaluate a modest reduction statistically. Perinatal or neonatal death (excluding fatal anomalies) was also reduced overall (RR 0.29, 95% CI 0.10 to 0.86) with a policy of planned caesarean section. The reduction in risk was similar for countries with low and high national perinatal mortality rates, although the numbers in these sub-groups were too

small for valid statistical evaluation. There were also significant reductions in neonatal morbidity overall and in specific measures of neonatal morbidity. Five minute Apgar scores below four (RR 0.11, 95% CI 0.01 to 0.88) and seven (RR 0.32, 95% CI 0.17 to 0.61) were reduced with planned caesarean section, as were cord blood pH less than 7.0 (RR 0.15, 95% CI 0.03 to 0.68) and cord blood base excess at least 15 (RR 0.30, 95% CI 0.10 to 0.92). The reduction in birth trauma with planned caesarean section was not statistically significant, and the numbers studied are too small to address the question specifically of brachial plexus injury satisfactorily.

A two-year follow-up was conducted at the Term Breech Trial centres which felt they would be able to achieve follow-up rates of about 80%. The primary outcome death or neurodevelopmental delay at age 2 years was similar between the two groups (RR 1.09, 95% CI 0.52 to 2.30).

In a secondary analysis of the data from the Term Breech Trial (not according to group allocation), adverse perinatal outcome was lowest with prelabour caesarean section and increased with caesarean section in early labour, in active labour, and vaginal birth. For women having labour, adverse perinatal outcome was also associated with labour augmentation, birth weight less than 2.8 kg, longer time between pushing and delivery and no experienced clinician at delivery (Su 2003).

Planned caesarean section compared with planned vaginal birth was associated with a small increase in short-term maternal morbidity, which was consistent between trials, and overall statistically significant (RR 1.29, 95% CI 1.03 to 1.61). Follow up for women at centres participating in the three-month follow up of the Term Breech Trial (Hannah 2000) was greater than 82%. At three months after delivery, women allocated to the planned caesarean section group reported less urinary incontinence (RR 0.62, 95% CI 0.41 to 0.93); more abdominal pain (RR 1.89, 95% CI 1.29 to 2.79); and less perineal pain (RR 0.32, 95% CI 0.18 to 0.58). There were no statistically significant differences in other outcomes.

The two-year follow-up of women enrolled in the term breech measured a wide range of outcomes relating to the women's health, incontinence of urine, flatus or faeces, pain, sexual function, depression, relationship with baby and partner, and subsequent pregnancies. The study was underpowered to detect modest differences in most of these outcomes. No differences were detected, except for an increase in constipation in the planned caesarean section group (RR 1.35, 95% CI 1.06 to 1.70).

DISCUSSION

The three trials reviewed studied different populations of breech presentation (frank (Collea 1980), complete or footling (Gimovsky 1983), and frank or complete (Hannah 2000)). In the first two trials x-ray pelvimetry and continuous electronic fetal monitoring in labour were used for all women; in the Term Breech Trial (Hannah 2000), these tests were used selectively. However, the estimates of effects are compatible between the trials. Because of the relative sizes of the trials, the findings of this review reflect mainly the findings of the Term Breech Trial.

The interventions being compared in this review are planned caesarean section versus planned vaginal birth according to a clinical protocol. The comparison is thus not only of the intended method of delivery, but includes possible effects of shorter pregnancies and fewer labours in the planned caesarean section group. This reflects the reality of implementing either policy in practice.

Overall, there was a reduction in perinatal or neonatal mortality or neonatal morbidity. However, in the Term Breech Trial two-year follow-up study, death or neurodevelopmental delay at age two years was similar in the two groups. Of 18 infants with short-term severe morbidity, one died following surgery for subglottic stenosis thought to be congenital in origin, and the remaining 17 had no evidence of neurodevelopmental delay at age two years. There is thus no evidence of long-term disability following the diagnosis of severe perinatal morbidity in this trial.

To determine whether the reduced mortality/neonatal morbidity in the planned caesarean section group might be specific to certain subgroups of women, the Term Breech Trial authors undertook numerous subgroup analyses. The reduction was greater in countries with low national perinatal mortality rates. The lack of similar reductions in high perinatal mortality rate countries appears anomalous. One possible explanation is that in these countries women are frequently discharged home shortly after vaginal birth. Documentation of neonatal complications following vaginal birth may have been less complete than for babies born by caesarean section, who spend a longer time under observation in hospital.

The subgroup analyses found similar reductions in risk of the main outcome (perinatal or neonatal death [excluding fatal anomalies] or serious neonatal morbidity) with planned caesarean section, compared to planned vaginal birth for all other subgroups defined by the baseline variables.

To determine whether the poorer short-term outcome in the planned vaginal birth group might be due to differences in practice in individual cases, the Term Breech Trial authors also undertook sensitivity analyses after excluding women having a vaginal breech delivery after augmentation or induction of labour with oxytocin or prostaglandins, if

- labour was prolonged;
- there was a footling breech or breech of uncertain type at delivery;
- epidural analgesia was not used; and
- there was no experienced clinician at the birth. Experienced clinician was defined in three different ways: according to the

study protocol, as one who considered him or herself skilled and experienced in vaginal breech delivery, confirmed by the individual's head of department, as a licensed obstetrician, as a clinician with over 10 years of vaginal breech delivery experience and as a clinician with over 20 years of vaginal breech delivery experience.

The main outcome (perinatal or neonatal death (excluding fatal anomalies) or serious neonatal morbidity) remained significantly less frequent in the planned caesarean section group after excluding these cases (Hannah 2000).

Perinatal or neonatal death (excluding fatal anomalies) was also reduced overall with planned caesarean section compared to planned vaginal birth. This reduction was similar for countries with low and high national perinatal mortality rates.

Short-term maternal morbidity was modestly increased with a policy of planned caesarean section. At three months after the birth, urinary incontinence was reduced by planned caesarean section. Although there was no difference in pain at three months after the birth in the Term Breech Trial (Hannah 2000), abdominal pain was more common following planned caesarean section while perineal pain was more common following planned vaginal birth. There were no statistically significant differences between groups for back pain, faecal or flatus incontinence, postnatal depression, maternal dissatisfaction with the experience, breastfeeding, relationship with the baby, relationship with the woman's partner, or dyspareunia. At two years, the only difference found was increased constipation in the planned caesarean section group. The added morbidity related to having a scarred uterus in subsequent pregnancies, and the ability to perform everyday activities were not assessed in these trials (*see* 'Implications for research' below).

Because the Term Breech Trial was conducted in a wide range of clinical settings, the results of the Term Breech Trial, and thus this review, may be generalised to a similarly wide range of clinical settings. However, the results of this review can not be generalised to settings where women labour and birth at home, or where caesarean section is not readily available, or to methods of breech delivery which differ materially from the clinical delivery protocols used in the trials reviewed. Also, as is the case with all randomised controlled trials, uncertainty remains as to whether results may be generalised to those who would not have agreed to randomisation because of strong views as to their preferred method of delivery. The results should also not be generalised to the preterm breech presentation or to twin pregnancies in which the first fetus is presenting cephalic and the second twin is presenting breech.

AUTHORS' CONCLUSIONS

Implications for practice

The reviewed trials indicate that a policy of planned caesarean section compared with planned vaginal birth according to a clinical protocol, for singleton term breech presentation, was associated with a decrease in perinatal or neonatal death and/or neonatal morbidity but no difference in death or neurodevelopmental delay at age 2 years. As the long-term outcome following perinatal morbidity appeared good, the most relevant outcome is the reduction in perinatal/neonatal death. This was 3/1166 (0.26%) in the planned caesarean section group versus 14/1222 (1.15%) in the planned vaginal birth group. At these rates (accepting that estimates based on small numbers are subject to wide variability), one death would be prevented for every 112 caesarean sections planned and one death would be prevented for every 53 additional caesarean sections performed.

For the mother, planned caesarean section was associated with a modest increase in short-term maternal morbidity, possibly a decrease in urinary incontinence at three months but not 2 years, and an increase in constipation at 2 years after the birth. Other outcomes at 2 years were similar between the two groups. The effects of caesarean section on longer-term outcomes, such as risks related to the scarred uterus, have not yet been addressed, nor have the cost implications.

To reduce the problems associated with breech delivery, an active policy of external cephalic version at term may be considered (*see* Hofmeyr 2000a; Hofmeyr 2000b; Hofmeyr 2000c). Secondly, caesarean breech deliveries may be delayed to allow time for spontaneous version to take place. In the Term Breech Trial (Hannah 2000), cephalic birth occurred in 19/1041 of the planned caesarean section group, compared with 39/1042 of the planned vaginal birth group ($p < 0.02$).

The data from this review should be applied with due consideration to specific health care environments and the circumstances of individual women. A policy of planned caesarean section may not be affordable or feasible in resource-poor settings. The long-term risks of caesarean section may be increased for women who may not access health services in subsequent pregnancies.

Individual women should be informed of the risks of vaginal breech delivery, the present and future risks of caesarean section, and our lack of accurate knowledge in the latter field, so that as informed a choice as possible can be made in each case.

A policy of planned caesarean section will reduce the overall incidence of cephalic birth and will not totally eliminate problems of vaginal breech birth (Hofmeyr 2001). In the group allocated to planned caesarean section in the Term Breech Trial (Hannah 2000), 100/1041 (9.6%) gave birth vaginally, most because the birth took place before caesarean section could be arranged; 22 (2.1%) experienced difficult deliveries; and six (0.6%) experienced birth trauma.

With a policy of routine caesarean section for breech presentation at term, in time the clinical skills of vaginal breech delivery will be eroded, placing women who deliver vaginally at increased risk.

Implications for research

Childbirth is a profound and unique human experience. Little is known about the evolutionary importance of the birth process to women's personal development, emotional wellbeing and adaptation to parenthood, and to subsequent child development, particularly for women who attach importance to giving birth normally. Future trials comparing planned caesarean section with planned vaginal birth should take care to ensure that the protocol for planned vaginal birth is designed to optimise the outcome for both mothers and infants. Further information on long-term benefits and risks of caesarean section for the woman will be useful for clinical decision-making.

Given that by choice or by default vaginal breech births will continue to take place, attention should be paid to techniques of vaginal delivery which might improve outcomes for the baby. For example, ready availability of symphysiotomy in the event of difficulty with delivery of the head (Wykes 2003) might reduce adverse outcomes and give reassurance to women keen to give birth vaginally.

POTENTIAL CONFLICT OF INTEREST

Mary Hannah is principal investigator and Justus Hofmeyr a collaborator of the Term Breech Trial (Hannah 2000), which is included in this review.

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TABLES

Characteristics of included studies

Study	Collea 1980
Methods	Allocation by "random selection". Method not specified.
Participants	Inclusion criteria: singleton frank breech presentation; 36 weeks or more gestation; estimated fetal weight between 2500 and 3800 grams; cervical dilation 7 cm or less. Exclusion criteria: hyperextension of the fetal head or evidence of fetal skeletal anomalies on abdominal x-ray; elderly primigravidae; obstetric indication for caesarean section; class B-F diabetes mellitus; floating station; involuntary infertility; pelvic contracture by previous x-ray pelvimetry; history of previous difficult or traumatic delivery.
Interventions	Planned delivery by caesarean section compared with a policy of vaginal breech delivery; x-ray pelvimetry was performed and if one or more pelvic inlet or midcavity measurements were reduced, caesarean section performed; oxytocin induction was permitted only for premature rupture of membranes with the fetus engaged in the maternal pelvis; oxytocin augmentation of labour was used for prolonged latent phase and protracted active phase dilation; fetal heart rate and uterine contractions were monitored throughout labour. Delivery by or supervised by a senior obstetric resident.
Outcomes	Actual use of caesarean section; brachial plexus injury; Apgar score < 7 at 5 minutes; short-term neonatal morbidity; perinatal mortality; maternal morbidity.
Notes	Los Angeles, California, USA. Data presented for four groups according to protocol selection and actual method of delivery. For this review, analysed according to protocol selection only (ie according to 'intention

	to treat'). A large discrepancy in numbers between groups (93 versus 115, and 37 versus 57 multiparous women) is not accounted for.
Allocation concealment	C – Inadequate

Study	**Gimovsky 1983**
Methods	"Randomisation" in a ratio of 1 caesarean section to 2 trials of labour, to allow for exclusions from trial of labour. Method of randomisation not specified.
Participants	Inclusion criteria: singleton pregnancy; non-frank breech presentation on abdominal x-ray; in labour; estimated gestational age 36-42 weeks; estimated fetal weight 2000 to 4000 g; cervix < 7 cm dilated; non-extended normal appearing fetal skull on x-ray; no contraindication to labour. Of 105 enrolled, 35 allocated to caesarean section and 70 to trial of labour. Exclusion criteria: severe pregnancy-induced hypertension; more than one prior caesarean section; previous stillbirth; history of infertility; class B diabetes mellitus; impaired intrauterine growth; abnormal antepartum fetal heart rate testing; abnormal amniotic fluid volume; multiple gestation.
Interventions	Planned elective caesarean section compared with planned trial of labour: x-ray pelvimetry performed and trial of labour allowed if measurements were at least 11 cm at anteroposterior diameter of the inlet, 12 cm at widest transverse diameter of the inlet and 10 cm between ischial spines at the midpelvis; continuous electronic fetal monitoring; oxytocin infusion on an optional basis for poor progress of labour; intravenous analgesia and assisted breech delivery with application of Piper forceps to aftercoming head. Delivery supervised by chief resident and/or obstetric staff.
Outcomes	Actual use of caesarean section; brachial plexus injury; Apgar score < 7 at 5 minutes; perinatal mortality; maternal morbidity.
Notes	Los Angeles. California, USA. Results reported in the study in 4 groups according to allocated and actual method of delivery. For this review analysed according to allocated method of delivery ('intention to treat') only.
Allocation concealment	C – Inadequate

Study	**Hannah 2000**
Methods	Centrally controlled computerised randomisation, stratified by parity (0 or > 0) and block sizes of 2.
Participants	Inclusion criteria: singleton live fetus; frank or complete breech presentation; 37 or more weeks' gestation. Exclusion criteria: fetopelvic disproportion; fetus judged to be 'large', or estimated 4000 g or more; hyperextension of fetal head; fetal anomaly or mechanical problem likely to affect delivery; contraindication to labour or vaginal delivery; known lethal fetal anomaly.
Interventions	Planned caesarean section: if not in labour, scheduled for 38 or more weeks' gestation if known, or following maturity testing or onset of labour. If no longer breech presentation, method of delivery reviewed. Planned vaginal birth: await spontaneous labour; induction or augmentation allowed if indicated; caesarean section if indication arose, including fetal heart rate abnormality or inadequate labour progress; assisted breech delivery by an experienced clinician; total breech extraction avoided.
Outcomes	Primary: Perinatal or neonatal mortality up to 28 days of age (excluding lethal congenital abnormalities) or specified serious neonatal morbidity. Secondary: Maternal mortality or specified serious maternal morbidity. 3-month follow up: Breastfeeding; infant health; ease of caring for infant; ease of adjusting to being a mother; sexual relations; relationship with partner; pain; urinary, flatal and faecal incontinence; depression; views regarding childbirth experience and participation in study, 2-year follow-up in selected centres: Perinatal/infant death or neurodevelopmental delay at age 2 years; maternal health at 2 years.
Notes	Multicentre trial. Countries classified as having low (20/1000 or less) or high perinatal mortality rates. Follow up at 3 months excluding centres unable to accomplish 80% follow up.

Allocation concealment A – Adequate

Characteristics of excluded studies

Study	Reason for exclusion
Confino 1985	Excluded because not a randomised trial. Breech delivery outcomes were compared retrospectively for alternate-day obstetric units. Unit 'B' used a conservative approach towards vaginal breech delivery and performed more caesarean sections (105/277, 38% versus 69/266, 26%). Unit 'A' made more use of x-ray pelvimetry, early rupture of membranes and oxytocin augmentation of labour. There were no statistically significant differences in duration of labour, Apgar scores or neonatal morbidity. There were 2 (0.7%) neonatal deaths in unit 'B' and 7 (2.6%) in unit 'A'.

ANALYSES

Comparison 01. Planned caesarean section for term breech presentation

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Perinatal/neonatal death or severe neonatal morbidity	2	2078	Relative Risk (Fixed) 95% CI	0.33 [0.19, 0.56]
02 Death or neurodevelopmental delay at age 2 years	1	920	Relative Risk (Fixed) 95% CI	1.09 [0.52, 2.30]
03 Serious short-term maternal morbidity or death	0	0	Relative Risk (Fixed) 95% CI	Not estimable
04 Postnatal depression, as defined by trial authors	1	1586	Relative Risk (Fixed) 95% CI	0.93 [0.70, 1.24]
05 Caesarean section	3	2396	Relative Risk (Fixed) 95% CI	2.04 [1.91, 2.17]
07 Instrumental vaginal delivery	0	0	Relative Risk (Fixed) 95% CI	Not estimable
11 Short-term maternal morbidity	3	2396	Relative Risk (Fixed) 95% CI	1.29 [1.03, 1.61]
14 Woman not satisfied	1	1596	Relative Risk (Fixed) 95% CI	1.00 [0.64, 1.56]
15 Not breastfeeding at 3 months	1	1557	Relative Risk (Fixed) 95% CI	1.04 [0.90, 1.21]
16 Perineal pain at 3 months	1	1593	Relative Risk (Fixed) 95% CI	0.32 [0.18, 0.58]
17 Abdominal pain at 3 months	1	1593	Relative Risk (Fixed) 95% CI	1.89 [1.29, 2.79]
18 Backache after at 3 months	1	1593	Relative Risk (Fixed) 95% CI	0.93 [0.71, 1.22]
19 Any pain after at 3 months	1	1593	Relative Risk (Fixed) 95% CI	1.09 [0.93, 1.29]
20 Dyspareunia at 3 months	1	1329	Relative Risk (Fixed) 95% CI	0.91 [0.72, 1.14]
22 Urinary incontinence at 3 months	1	1595	Relative Risk (Fixed) 95% CI	0.62 [0.41, 0.93]
23 Flatus incontinence at 3 months	1	1222	Relative Risk (Fixed) 95% CI	1.10 [0.79, 1.53]
24 Faecal incontinence at 3 months	1	1226	Relative Risk (Fixed) 95% CI	0.54 [0.18, 1.62]
28 Perinatal/neonatal mortality (excluding fatal malformations)	4	2388	Relative Risk (Fixed) 95% CI	0.29 [0.10, 0.86]
30 5 minute Apgar < 7	3	2375	Relative Risk (Fixed) 95% CI	0.32 [0.17, 0.61]
31 5 minute Apgar < 4	1	2062	Relative Risk (Fixed) 95% CI	0.11 [0.01, 0.87]
32 Cord blood pH < 7.0	1	1013	Relative Risk (Fixed) 95% CI	0.15 [0.03, 0.67]
33 Cord blood base deficit =/> 15	1	899	Relative Risk (Fixed) 95% CI	0.30 [0.10, 0.92]
34 Brachial plexus injury	3	2375	Relative Risk (Fixed) 95% CI	0.35 [0.08, 1.47]
35 Birth trauma, as defined by trial authors	1	2062	Relative Risk (Fixed) 95% CI	0.42 [0.16, 1.10]

36 Infant medical problems at 2 years	1	843	Relative Risk (Fixed) 95% CI	1.41 [1.05, 1.89]
37 Neurodevelopmental delay at age 2 years	1	920	Relative Risk (Fixed) 95% CI	1.74 [0.69, 4.37]
40 Headache at 2 years	1	917	Relative Risk (Fixed) 95% CI	1.05 [0.88, 1.25]
41 Perineal pain at 2 years	1	917	Relative Risk (Fixed) 95% CI	0.65 [0.36, 1.15]
43 Back pain at 2 years	1	917	Relative Risk (Fixed) 95% CI	1.03 [0.88, 1.20]
44 Sexual problems at 2 years	1	917	Relative Risk (Fixed) 95% CI	0.95 [0.62, 1.48]
45 Painful intercourse at 2 years	1	830	Relative Risk (Fixed) 95% CI	1.48 [0.53, 4.12]
47 Urinary incontinence at 2 years	1	917	Relative Risk (Fixed) 95% CI	0.82 [0.63, 1.06]
48 Flatus incontinence at 2 years	1	917	Relative Risk (Fixed) 95% CI	1.14 [0.81, 1.61]
49 Faecal incontinence at 2 years	1	917	Relative Risk (Fixed) 95% CI	1.11 [0.47, 2.58]
50 Constipation at 2 years	1	917	Relative Risk (Fixed) 95% CI	1.34 [1.06, 1.70]
51 Haemorrhoids at 2 years	1	917	Relative Risk (Fixed) 95% CI	1.10 [0.85, 1.43]
52 Subsequent birth or pregnant at 2 years	1	917	Relative Risk (Fixed) 95% CI	0.93 [0.71, 1.24]
54 Subsequent caesarean section at 2 years	1	917	Relative Risk (Fixed) 95% CI	1.24 [0.60, 2.55]
56 Painful menstrual periods at 2 years	1	917	Relative Risk (Fixed) 95% CI	0.90 [0.71, 1.15]
57 Heavy menstrual periods at 2 years	1	917	Relative Risk (Fixed) 95% CI	1.09 [0.78, 1.52]
58 Depression at 2 years	1	917	Relative Risk (Fixed) 95% CI	0.89 [0.62, 1.29]
60 Difficulty caring for child at 2 years	1	873	Relative Risk (Fixed) 95% CI	0.96 [0.72, 1.29]
61 Relationship with partner unhappy at 2 years	1	856	Relative Risk (Fixed) 95% CI	1.02 [0.63, 1.66]
62 Unhappy with sexual relations at 2 years	1	702	Relative Risk (Fixed) 95% CI	0.87 [0.51, 1.50]

INDEX TERMS

Medical Subject Headings (MeSH)

*Breech Presentation; *Cesarean Section; Randomized Controlled Trials

MeSH check words

Female; Humans; Pregnancy

COVER SHEET

Title	Planned caesarean section for term breech delivery
Authors	Hofmeyr GJ, Hannah ME
Contribution of author(s)	GJ Hofmeyr and ME Hannah prepared the review together. GJ Hofmeyr is responsible for maintaining the review.
Issue protocol first published	1995/2
Review first published	1995/2
Date of most recent amendment	15 February 2006
Date of most recent SUBSTANTIVE amendment	01 April 2003

What's New	November 2004 The two-year follow-up data for the Term Breech Trial (Hannah 2000) have been included in this review. The conclusions have not changed. January 2003 The three-month follow-up data for the Term Breech Trial (Hannah 2000) have been included in this review.
Date new studies sought but none found	30 October 2004
Date new studies found but not yet included/excluded	Information not supplied by author
Date new studies found and included/excluded	01 September 2003
Date authors' conclusions section amended	07 November 2002
Contact address	Prof G Justus Hofmeyr Director/Hon. Professor, Effective Care Research Unit Department of Obstetrics and Gynaecology, East London Hospital Complex University of the Witwatersrand, University of Fort Hare, Eastern Cape Department of Health Frere and Cecilia Makiwane Hospitals Private Bag X 9047 East London Eastern Cape 5200 SOUTH AFRICA E-mail: gjh@global.co.za Tel: +27 43 7092483 Fax: +27 43 7092483
DOI	10.1002/14651858.CD000166
Cochrane Library number	CD000166
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Editorial group code	HM-PREG

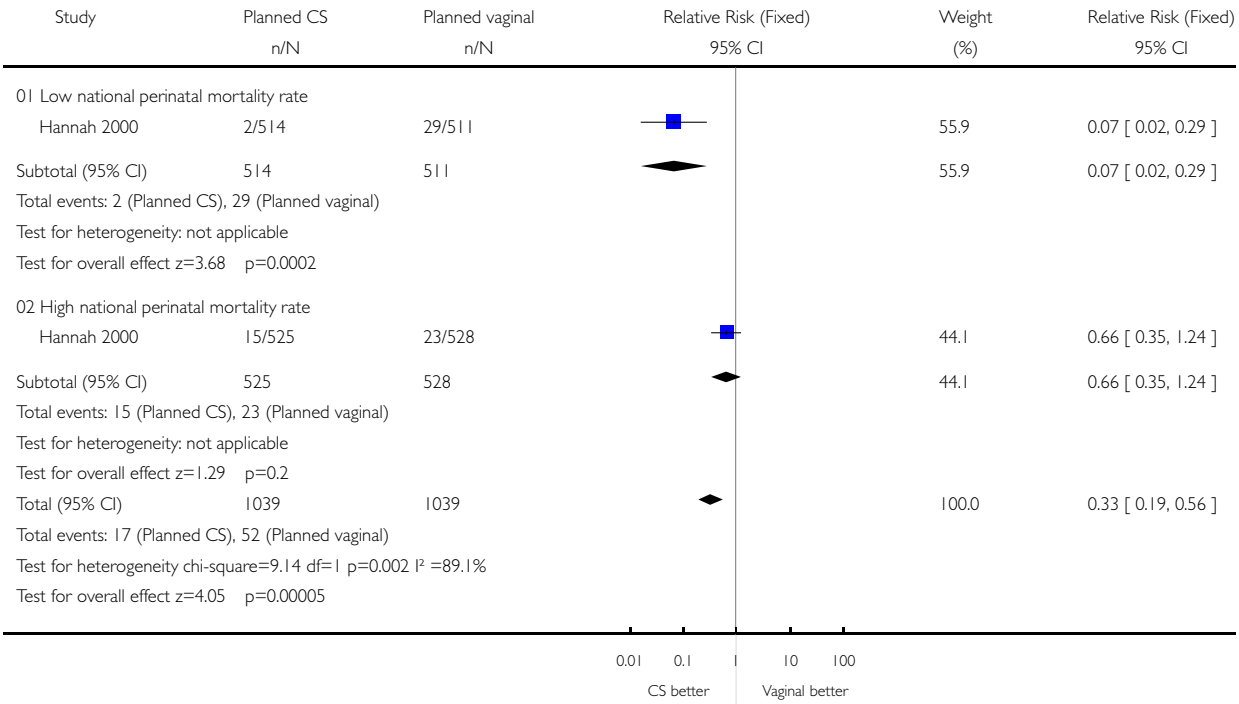
GRAPHS AND OTHER TABLES

Analysis 01.01. Comparison 01 Planned caesarean section for term breech presentation, Outcome 01 Perinatal/neonatal death or severe neonatal morbidity

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 01 Perinatal/neonatal death or severe neonatal morbidity

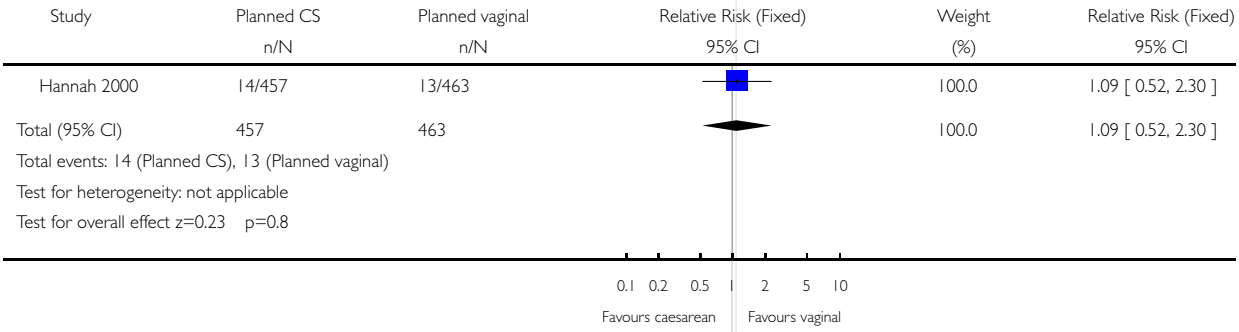


Analysis 01.02. Comparison 01 Planned caesarean section for term breech presentation, Outcome 02 Death or neurodevelopmental delay at age 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 02 Death or neurodevelopmental delay at age 2 years



Analysis 01.04. Comparison 01 Planned caesarean section for term breech presentation, Outcome 04 Postnatal depression, as defined by trial authors

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 04 Postnatal depression, as defined by trial authors

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	80/793	86/793		100.0	0.93 [0.70, 1.24]
Total (95% CI)	793	793		100.0	0.93 [0.70, 1.24]
Total events: 80 (Planned CS), 86 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.49 p=0.6					

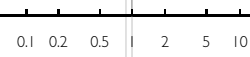
Analysis 01.05. Comparison 01 Planned caesarean section for term breech presentation, Outcome 05 Caesarean section

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 05 Caesarean section

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Collea 1980	88/93	60/115		10.1	1.81 [1.51, 2.17]
Gimovsky 1983	31/35	39/70		4.9	1.59 [1.25, 2.02]
Hannah 2000	941/1041	451/1042		85.0	2.09 [1.94, 2.25]
Total (95% CI)	1169	1227		100.0	2.04 [1.91, 2.17]
Total events: 1060 (Planned CS), 550 (Planned vaginal)					
Test for heterogeneity chi-square=6.11 df=2 p=0.05 I^2 =67.3%					
Test for overall effect z=21.31 p<0.00001					



Analysis 01.11. Comparison 01 Planned caesarean section for term breech presentation, Outcome 11 Short-term maternal morbidity

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

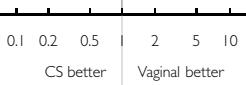
Outcome: 11 Short-term maternal morbidity

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Collea 1980	48/93	45/115		43.8	1.32 [0.98, 1.78]
Gimovsky 1983	18/35	28/70		20.3	1.29 [0.84, 1.98]
Hannah 2000	41/1041	33/1042		35.9	1.24 [0.79, 1.95]
Total (95% CI)	1169	1227		100.0	1.29 [1.03, 1.61]

Total events: 107 (Planned CS), 106 (Planned vaginal)

Test for heterogeneity chi-square=0.05 df=2 p=0.98 I^2 =0.0%

Test for overall effect z=2.18 p=0.03



Analysis 01.14. Comparison 01 Planned caesarean section for term breech presentation, Outcome 14 Woman not satisfied

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

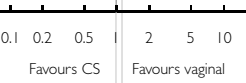
Outcome: 14 Woman not satisfied

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	37/798	37/798		100.0	1.00 [0.64, 1.56]
Total (95% CI)	798	798		100.0	1.00 [0.64, 1.56]

Total events: 37 (Planned CS), 37 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.00 p=1



Analysis 01.15. Comparison 01 Planned caesarean section for term breech presentation, Outcome 15 Not breastfeeding at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 15 Not breastfeeding at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	248/781	237/776		100.0	1.04 [0.90, 1.21]
Total (95% CI)	781	776		100.0	1.04 [0.90, 1.21]

Total events: 248 (Planned CS), 237 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.52 p=0.6

Analysis 01.16. Comparison 01 Planned caesarean section for term breech presentation, Outcome 16 Perineal pain at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 16 Perineal pain at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	14/796	44/797		100.0	0.32 [0.18, 0.58]
Total (95% CI)	796	797		100.0	0.32 [0.18, 0.58]

Total events: 14 (Planned CS), 44 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=3.78 p=0.0002

Analysis 01.17. Comparison 01 Planned caesarean section for term breech presentation, Outcome 17 Abdominal pain at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 17 Abdominal pain at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	70/796	37/797		100.0	1.89 [1.29, 2.79]
Total (95% CI)	796	797		100.0	1.89 [1.29, 2.79]
Total events: 70 (Planned CS), 37 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=3.24 p=0.001					

Analysis 01.18. Comparison 01 Planned caesarean section for term breech presentation, Outcome 18 Backache after at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 18 Backache after at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	90/796	97/797		100.0	0.93 [0.71, 1.22]
Total (95% CI)	796	797		100.0	0.93 [0.71, 1.22]
Total events: 90 (Planned CS), 97 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.54 p=0.6					

Analysis 01.19. Comparison 01 Planned caesarean section for term breech presentation, Outcome 19 Any pain after at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 19 Any pain after at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	217/796	199/797		100.0	1.09 [0.93, 1.29]
Total (95% CI)	796	797		100.0	1.09 [0.93, 1.29]
Total events: 217 (Planned CS), 199 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.04 p=0.3					

Analysis 01.20. Comparison 01 Planned caesarean section for term breech presentation, Outcome 20 Dyspareunia at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 20 Dyspareunia at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	111/655	126/674		100.0	0.91 [0.72, 1.14]
Total (95% CI)	655	674		100.0	0.91 [0.72, 1.14]
Total events: 111 (Planned CS), 126 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.83 p=0.4					

Analysis 01.22. Comparison 01 Planned caesarean section for term breech presentation, Outcome 22 Urinary incontinence at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 22 Urinary incontinence at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	36/798	58/797		100.0	0.62 [0.41, 0.93]
Total (95% CI)	798	797		100.0	0.62 [0.41, 0.93]
Total events: 36 (Planned CS), 58 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=2.32 p=0.02					

Analysis 01.23. Comparison 01 Planned caesarean section for term breech presentation, Outcome 23 Flatus incontinence at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 23 Flatus incontinence at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	66/616	59/606		100.0	1.10 [0.79, 1.53]
Total (95% CI)	616	606		100.0	1.10 [0.79, 1.53]
Total events: 66 (Planned CS), 59 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.56 p=0.6					

Analysis 01.24. Comparison 01 Planned caesarean section for term breech presentation, Outcome 24 Faecal incontinence at 3 months

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 24 Faecal incontinence at 3 months

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	5/619	9/607		100.0	0.54 [0.18, 1.62]
Total (95% CI)	619	607		100.0	0.54 [0.18, 1.62]
Total events: 5 (Planned CS), 9 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.09 p=0.3					

Analysis 01.28. Comparison 01 Planned caesarean section for term breech presentation, Outcome 28 Perinatal/neonatal mortality (excluding fatal malformations)

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 28 Perinatal/neonatal mortality (excluding fatal malformations)

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
01 Low national perinatal mortality rate					
× Collea 1980	0/93	0/114		0.0	Not estimable
Gimovsky 1983	0/34	1/69		6.9	0.67 [0.03, 15.95]
Hannah 2000	0/514	3/511		24.2	0.14 [0.01, 2.74]
Subtotal (95% CI)	641	694		31.1	0.26 [0.03, 2.00]
Total events: 0 (Planned CS), 4 (Planned vaginal)					
Test for heterogeneity chi-square=0.50 df=1 p=0.48 I^2 =0.0%					
Test for overall effect z=1.29 p=0.2					
02 High national perinatal mortality rate					
Hannah 2000	3/525	10/528		68.9	0.30 [0.08, 1.09]
Subtotal (95% CI)	525	528		68.9	0.30 [0.08, 1.09]
Total events: 3 (Planned CS), 10 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.83 p=0.07					
Total (95% CI)	1166	1222		100.0	0.29 [0.10, 0.86]
Total events: 3 (Planned CS), 14 (Planned vaginal)					
Test for heterogeneity chi-square=0.49 df=2 p=0.78 I^2 =0.0%					
Test for overall effect z=2.24 p=0.03					

Analysis 01.30. Comparison 01 Planned caesarean section for term breech presentation, Outcome 30 5 minute Apgar < 7

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

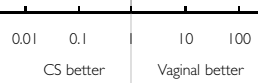
Outcome: 30 5 minute Apgar < 7

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Collea 1980	1/93	5/115		12.1	0.25 [0.03, 2.08]
Gimovsky 1983	2/35	2/70		3.6	2.00 [0.29, 13.61]
Hannah 2000	8/1036	31/1026		84.3	0.26 [0.12, 0.55]
Total (95% CI)	1164	1211		100.0	0.32 [0.17, 0.61]

Total events: 11 (Planned CS), 38 (Planned vaginal)

Test for heterogeneity chi-square=3.89 df=2 p=0.14 I^2 =48.6%

Test for overall effect z=3.46 p=0.0005



Analysis 01.31. Comparison 01 Planned caesarean section for term breech presentation, Outcome 31 5 minute Apgar < 4

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 31 5 minute Apgar < 4

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	1/1036	9/1026		100.0	0.11 [0.01, 0.87]
Total (95% CI)	1036	1026		100.0	0.11 [0.01, 0.87]

Total events: 1 (Planned CS), 9 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=2.10 p=0.04

Analysis 01.32. Comparison 01 Planned caesarean section for term breech presentation, Outcome 32 Cord blood pH < 7.0

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 32 Cord blood pH < 7.0

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	2/510	13/503		100.0	0.15 [0.03, 0.67]
Total (95% CI)	510	503		100.0	0.15 [0.03, 0.67]
Total events: 2 (Planned CS), 13 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=2.49 p=0.01					

Analysis 01.33. Comparison 01 Planned caesarean section for term breech presentation, Outcome 33 Cord blood base deficit =/> 15

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 33 Cord blood base deficit =/> 15

Study	Planned CS n/N	Planned vaginal del n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	4/453	13/446		100.0	0.30 [0.10, 0.92]
Total (95% CI)	453	446		100.0	0.30 [0.10, 0.92]
Total events: 4 (Planned CS), 13 (Planned vaginal del)					
Test for heterogeneity: not applicable					
Test for overall effect z=2.10 p=0.04					

Analysis 01.34. Comparison 01 Planned caesarean section for term breech presentation, Outcome 34 Brachial plexus injury

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

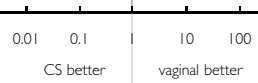
Outcome: 34 Brachial plexus injury

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Collea 1980	0/93	2/115		30.8	0.25 [0.01, 5.08]
× Gimovsky 1983	0/35	0/70		0.0	Not estimable
Hannah 2000	2/1036	5/1026		69.2	0.40 [0.08, 2.04]
Total (95% CI)	1164	1211		100.0	0.35 [0.08, 1.47]

Total events: 2 (Planned CS), 7 (Planned vaginal)

Test for heterogeneity chi-square=0.07 df=1 p=0.79 I^2 =0.0%

Test for overall effect z=1.43 p=0.2



Analysis 01.35. Comparison 01 Planned caesarean section for term breech presentation, Outcome 35 Birth trauma, as defined by trial authors

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

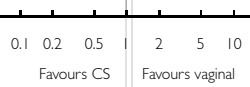
Outcome: 35 Birth trauma, as defined by trial authors

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	6/1036	14/1026		100.0	0.42 [0.16, 1.10]
Total (95% CI)	1036	1026		100.0	0.42 [0.16, 1.10]

Total events: 6 (Planned CS), 14 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=1.76 p=0.08



Analysis 01.36. Comparison 01 Planned caesarean section for term breech presentation, Outcome 36 Infant medical problems at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 36 Infant medical problems at 2 years

Study	Planned CS n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	86/415	63/428		100.0	1.41 [1.05, 1.89]
Total (95% CI)	415	428		100.0	1.41 [1.05, 1.89]
Total events: 86 (Planned CS), 63 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=2.27 p=0.02					

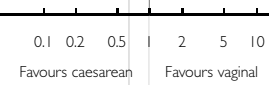
Analysis 01.37. Comparison 01 Planned caesarean section for term breech presentation, Outcome 37 Neurodevelopmental delay at age 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 37 Neurodevelopmental delay at age 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	12/457	7/463		100.0	1.74 [0.69, 4.37]
Total (95% CI)	457	463		100.0	1.74 [0.69, 4.37]
Total events: 12 (Planned caesarean), 7 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.17 p=0.2					



Analysis 01.40. Comparison 01 Planned caesarean section for term breech presentation, Outcome 40 Headache at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 40 Headache at 2 years

Study	planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	163/457	157/460		100.0	1.05 [0.88, 1.25]
Total (95% CI)	457	460		100.0	1.05 [0.88, 1.25]

Total events: 163 (planned caesarean), 157 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.49 p=0.6

Analysis 01.41. Comparison 01 Planned caesarean section for term breech presentation, Outcome 41 Perineal pain at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

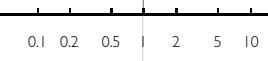
Outcome: 41 Perineal pain at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	18/457	28/460		100.0	0.65 [0.36, 1.15]
Total (95% CI)	457	460		100.0	0.65 [0.36, 1.15]

Total events: 18 (Planned caesarean), 28 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=1.48 p=0.1



Analysis 01.43. Comparison 01 Planned caesarean section for term breech presentation, Outcome 43 Back pain at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 43 Back pain at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	187/457	183/460		100.0	1.03 [0.88, 1.20]
Total (95% CI)	457	460		100.0	1.03 [0.88, 1.20]

Total events: 187 (Planned caesarean), 183 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.35 p=0.7

Analysis 01.44. Comparison 01 Planned caesarean section for term breech presentation, Outcome 44 Sexual problems at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 44 Sexual problems at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	36/457	38/460		100.0	0.95 [0.62, 1.48]
Total (95% CI)	457	460		100.0	0.95 [0.62, 1.48]

Total events: 36 (Planned caesarean), 38 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.21 p=0.8

Analysis 01.45. Comparison 01 Planned caesarean section for term breech presentation, Outcome 45 Painful intercourse at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 45 Painful intercourse at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	9/418	6/412		100.0	1.48 [0.53, 4.12]
Total (95% CI)	418	412		100.0	1.48 [0.53, 4.12]

Total events: 9 (Planned caesarean), 6 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.75 p=0.5

Analysis 01.47. Comparison 01 Planned caesarean section for term breech presentation, Outcome 47 Urinary incontinence at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

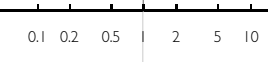
Outcome: 47 Urinary incontinence at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	81/457	100/460		100.0	0.82 [0.63, 1.06]
Total (95% CI)	457	460		100.0	0.82 [0.63, 1.06]

Total events: 81 (Planned caesarean), 100 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=1.52 p=0.1



Analysis 01.48. Comparison 01 Planned caesarean section for term breech presentation, Outcome 48 Flatus incontinence at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 48 Flatus incontinence at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	60/457	53/460		100.0	1.14 [0.81, 1.61]
Total (95% CI)	457	460		100.0	1.14 [0.81, 1.61]
Total events: 60 (Planned caesarean), 53 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.74 p=0.5					

Analysis 01.49. Comparison 01 Planned caesarean section for term breech presentation, Outcome 49 Faecal incontinence at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 49 Faecal incontinence at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	11/457	10/460		100.0	1.11 [0.47, 2.58]
Total (95% CI)	457	460		100.0	1.11 [0.47, 2.58]
Total events: 11 (Planned caesarean), 10 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.24 p=0.8					

Analysis 01.50. Comparison 01 Planned caesarean section for term breech presentation, Outcome 50 Constipation at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 50 Constipation at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	124/457	93/460		100.0	1.34 [1.06, 1.70]
Total (95% CI)	457	460		100.0	1.34 [1.06, 1.70]

Total events: 124 (Planned caesarean), 93 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=2.45 p=0.01

Analysis 01.51. Comparison 01 Planned caesarean section for term breech presentation, Outcome 51 Haemorrhoids at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

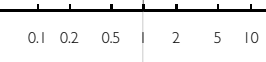
Outcome: 51 Haemorrhoids at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	93/457	85/460		100.0	1.10 [0.85, 1.43]
Total (95% CI)	457	460		100.0	1.10 [0.85, 1.43]

Total events: 93 (Planned caesarean), 85 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.72 p=0.5



Analysis 01.52. Comparison 01 Planned caesarean section for term breech presentation, Outcome 52 Subsequent birth or pregnant at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 52 Subsequent birth or pregnant at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	78/457	84/460		100.0	0.93 [0.71, 1.24]
Total (95% CI)	457	460		100.0	0.93 [0.71, 1.24]
Total events: 78 (Planned caesarean), 84 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.47 p=0.6					

Analysis 01.54. Comparison 01 Planned caesarean section for term breech presentation, Outcome 54 Subsequent caesarean section at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 54 Subsequent caesarean section at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	16/457	13/460		100.0	1.24 [0.60, 2.55]
Total (95% CI)	457	460		100.0	1.24 [0.60, 2.55]
Total events: 16 (Planned caesarean), 13 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.58 p=0.6					

Analysis 01.56. Comparison 01 Planned caesarean section for term breech presentation, Outcome 56 Painful menstrual periods at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 56 Painful menstrual periods at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	95/457	106/460		100.0	0.90 [0.71, 1.15]
Total (95% CI)	457	460		100.0	0.90 [0.71, 1.15]
Total events: 95 (Planned caesarean), 106 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.82 p=0.4					

Analysis 01.57. Comparison 01 Planned caesarean section for term breech presentation, Outcome 57 Heavy menstrual periods at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 57 Heavy menstrual periods at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	63/457	58/460		100.0	1.09 [0.78, 1.52]
Total (95% CI)	457	460		100.0	1.09 [0.78, 1.52]
Total events: 63 (Planned caesarean), 58 (Planned vaginal)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.53 p=0.6					

Analysis 01.58. Comparison 01 Planned caesarean section for term breech presentation, Outcome 58 Depression at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 58 Depression at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	47/457	53/460		100.0	0.89 [0.62, 1.29]
Total (95% CI)	457	460		100.0	0.89 [0.62, 1.29]

Total events: 47 (Planned caesarean), 53 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.60 p=0.5

Analysis 01.60. Comparison 01 Planned caesarean section for term breech presentation, Outcome 60 Difficulty caring for child at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 60 Difficulty caring for child at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	73/430	78/443		100.0	0.96 [0.72, 1.29]
Total (95% CI)	430	443		100.0	0.96 [0.72, 1.29]

Total events: 73 (Planned caesarean), 78 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.25 p=0.8

Analysis 01.61. Comparison 01 Planned caesarean section for term breech presentation, Outcome 61 Relationship with partner unhappy at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 61 Relationship with partner unhappy at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	31/430	30/426		100.0	1.02 [0.63, 1.66]
Total (95% CI)	430	426		100.0	1.02 [0.63, 1.66]

Total events: 31 (Planned caesarean), 30 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.09 p=0.9

Analysis 01.62. Comparison 01 Planned caesarean section for term breech presentation, Outcome 62 Unhappy with sexual relations at 2 years

Review: Planned caesarean section for term breech delivery

Comparison: 01 Planned caesarean section for term breech presentation

Outcome: 62 Unhappy with sexual relations at 2 years

Study	Planned caesarean n/N	Planned vaginal n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Hannah 2000	23/353	26/349		100.0	0.87 [0.51, 1.50]
Total (95% CI)	353	349		100.0	0.87 [0.51, 1.50]

Total events: 23 (Planned caesarean), 26 (Planned vaginal)

Test for heterogeneity: not applicable

Test for overall effect z=0.49 p=0.6