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Homebirth guidance

Evidence summary

A systematic review of outcomes for planned homebirth for low-risk women

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# Introduction

A total of 20 papers were included that compared the outcomes of planned homebirth to planned hospital birth at the onset of labour among low-risk women. Of the 20 papers, 13 also reported some outcomes by parity. The majority of studies (n=15) were considered high quality.

There were no statistically significant differences in the rates of intrapartum stillbirth, early (<7 days) or late (<28 days) neonatal death between planned homebirth and planned hospital birth at the onset of labour. There was also no difference in the rates of admission to neonatal intensive care unit (NICU) or Apgar less than 7 at five minutes.

Planned homebirth was associated with a significantly higher rate of unassisted vaginal birth and significantly lower rate of instrumental or caesarean birth.

Overall, planned homebirth was associated with a significantly lower rate of manual removal of the placenta and postpartum haemorrhage (>=500 mL or >=1000 mL). There was no difference in the rates of severe perineal trauma.

Outcomes did not differ by parity.

The rate of intrapartum transfer ranged from nine to 28 per cent, with an average of 14 per cent.

The rate of postpartum transfer ranged from three to seven per cent, with an average of six per cent.

Nulliparous women had higher rates of intrapartum and postpartum transfer when compared to multiparous women.

## Methodology

### Study selection

A systemic identification of studies from 2000 to 20161 was adapted and extended to November 2019. All search terms and methodology can be found in the previous systematic review on place of birth.1 For studies identified post 2016, reference lists were also screened to identify any additional studies. Studies identified in the previous review1 that did not specifically report on homebirth were excluded.

### Study inclusion criteria

The inclusion criteria for this updated review included the following:

* Original research articles published or available online from January 2000 to November 2019.
* Study inclusion or stratification for low-risk women (singletons, non-vertex presentations, no previous caesarean section, term gestation (37–42 weeks), not a planned elective caesarean section, no gestational diabetes mellitus or hypertension.
* Conducted in a high-income country as defined by the World Bank.
* Intended place of birth determined at the onset of labour or close to the onset of labour as either planned home or health facility birth.
* Comparator in the study was planned hospital/maternity unit birth with either midwife- or obstetrician-led care.

### Predefined outcomes

* Intrapartum stillbirth
* Neonatal death
  + 7 days
  + 28 days
* Neonatal Intensive Care Unit (NICU) admission
* Apgar<7 at five minutes
* Mode of birth
  + Vaginal birth
  + Instrumental birth
  + Caesarean section
* Severe perineal trauma (3rd or 4th degree tear)
* Manual placenta removal
* Post partum haemorrhage
  + >=500 mL
  + <=1000 mL
* Transfer to hospital rates
  + Intrapartum
  + Postpartum

All rates are reported by parity if available.

### Study appraisal

Assessment of study quality was undertaken as per the SCV guidance on guideline development document using the ResQu Index2. The ResQu Index is a quality scoring tool specific to assessing risk of bias in studies that compare different birth settings. All papers were assessed by two independent assessors.

The full list of studies included, and quality assessment is presented in **Table 1**. All data were extracted and entered into RevMan. Risk ratios were estimated with random effects due to the heterogeneity of the studies. Some studies reported different outcomes within the same cohort and are grouped together in **Table 1**. Where two studies reported the same outcomes in an overlapping cohort the larger study was reported. Outcomes were also reported by parity where possible.

# Results

A total of 20 papers were included that compared the outcomes of planned homebirth to planned hospital birth at the onset of labour among low-risk women. Of the 20 papers, 13 also reported some outcomes by parity. Not all papers reported on the same outcomes. The majority of studies (n=15) were considered high quality, four were of moderate and one was low quality. Seven studies were from the Netherlands, four from New Zealand, three from Australia and one study each from England, the United Kingdom, Iceland, Norway, Japan and USA. See a list of included studies in **Appendix 1**. **Table 1** presents the perinatal, maternal and mode of birth outcomes.

There were no statistically significant differences in the rates of intrapartum stillbirth, early (<7 days) or late (<28 days) neonatal death between planned homebirth and planned hospital birth at the onset of labour. There was also no difference in the rates of admission to NICU or Apgar less than 7 at five minutes.

Planned homebirth was associated with a significantly higher rate of unassisted vaginal birth and significantly lower rate of instrumental or caesarean birth.

Planned homebirth was associated with a significantly lower rate of manual removal of the placenta and postpartum haemorrhage at >=500 mL or >=1000 mL. There was no difference in the rates of severe perineal trauma.

The association between planned homebirth and outcomes by parity are presented in **Table 2.**

For nulliparous women, there was no difference in risk of intrapartum stillbirth, early or late neonatal death (NND), NICU admission, Apgar score <7 at five minutes, severe perineal trauma, manual removal of the placenta or PPH>=1000 mL. Planned homebirth among nulliparous women is associated with a significantly higher rate of unassisted vaginal birth and lower rate of both instrumental and caesarean birth. Planned homebirth was also associated with a lower of postpartum haemorrhage of >=500 mL.

For multiparous women, there was no difference in risk of intrapartum stillbirth, early or late NND, however planned homebirth was associated with a lower rate of NICU admission and Apgar score <7 at five minutes. Planned homebirth was also associated with a significantly lower rate of instrumental birth, caesarean birth, severe perineal trauma, manual removal of the placenta and PPH of 500 and 1000 mL or more.

## Transfer rates

Of the 20 papers identified, nine reported on transfer rates for women who planned a homebirth at the onset of labour with a midwife. Four additional studies, which did not meet our inclusion criteria due to not having a hospital-based control group, also reported the rates of transfers for planned homebirth among low-risk women and were included in the transfer analysis. The list of identified studies is presented in **Table 3**. Eight of the studies specifically reported intrapartum and/or postpartum transfers separately and five either combined or did not specify. Ten studies reported transfers stratified for parity.

Of the eight studies that reported specifically on intrapartum transfers, rates ranged from nine per cent to 28 per cent (average 14%). When nulliparous and parous women were considered separately, the rate of intrapartum transfer ranged from 22 per cent to 52 per cent (average 34%) for nulliparous women and from three per cent to 11 per cent (average 6%) for parous women.

Among the seven studies that reported specifically on postpartum transfers, the rate of transfer ranged from three per cent to seven per cent (average 6%). When nulliparous and parous women were considered separately, the rate of intrapartum transfer ranged from five per cent to nine per cent (average 7%) for nulliparous women and from two per cent to five per cent (average 5%) for parous women. See a list of included studies in **Appendix 1.**

**Table 1. Meta-analysis of outcomes**

|  |  |  |  |
| --- | --- | --- | --- |
| Outcome | Number of studies included | I2 | Risk ratio (95% CI) |
| **Perinatal outcomes** | | | |
| Intrapartum stillbirth | 63 4 6 9 10 17 | 18% | 1.03 (0.53 to 1.99) |
| Neonatal death< 7 days | 53 4 9 10 17 | 0% | 0.96 (0.75 to 1.22) |
| Neonatal death <28 days | 54 6 9 15 17 | 10% | 1.16 (0.77 to 1.74) |
| NICU admission | 63 9 10 15 17 18 | 98% | 0.56 (0.30 to 1.04) |
| Apgar <7 at 5 minutes | 63 4 9 10 15 18 | 50% | 0.75 (0.64 to 0.87) |
| **Mode of birth** | | | |
| Unassisted vaginal birth | 83-6 10 17 20 23 | 100% | 1.11 (1.03 to 1.19) |
| Instrumental birth | 83-6 10 17 19 20 | 99% | 0.36 (0.21 to 0.61) |
| Unplanned caesarean | 83-6 10 17 19 20 | 88% | 0.34 (0.27 to 0.41) |
| **Maternal morbidities** | | | |
| Severe perineal trauma | 83-5 10 16 17 19 20 | 91% | 0.73 (0.52 to 1.02) |
| Manual removal of the placenta | 315 16 | 83% | 0.56 (0.34 to 0.93) |
| Postpartum haemorrhage >=500 mL | 44 10 15 21 | 86% | 0.52 (0.35 to 0.78) |
| Postpartum haemorrhage >=1000 mL | 75 7 8 10 12 16 20 | 58% | 0.72 (0.59 to 0.89) |

**Table 2. Meta-analysis of outcomes by parity**

|  |  |  |  |
| --- | --- | --- | --- |
| Outcome | Number of studies included | I2 | Risk ratio (95% CI) |
| **Nulliparous** | | | |
| Intrapartum stillbirth | 43 4 9 10 | 64% | 2.59 (0.44 to 15.20) |
| Neonatal death <7 days | 43 4 9 10 | 0% | 1.00 (0.74 to 1.36) |
| Neonatal death <28 days | 24 9 | 0% | 1.00 (0.74 to 1.36) |
| NICU admission | 33 9 10 | 59% | 0.92 (0.75 to 1.14) |
| Apgar <7 at five minutes | 43 4 9 10 | 78% | 1.14 (0.7 to 1.84) |
| Unassisted vaginal birth | 53-5 9 10 | 94% | 1.13 (1.03 to 1.24) |
| Instrumental birth | 43-5 10 | 82% | 0.63 (0.47 to 0.86) |
| Unplanned caesarean | 53-5 10 16 | 69% | 0.72 (0.53 to 0.99) |
| Severe perineal trauma | 53-5 10 16 | 81% | 1.08 (0.57 to 2.04) |
| Manual removal of the placenta | 28 16 | 0% | 0.97 (0.89 to 1.06) |
| Postpartum haemorrhage >=500 mL | 24 10 | 0% | 0.68 (0.51 to 0.91) |
| Postpartum haemorrhage >=1000 mL | 45 8 10 16 | 0% | 1.00 (0.93 to 1.08) |
| **Multiparous** | | | |
| Intrapartum stillbirth | 43 4 9 10 | 3% | 1.07 (0.69 to 1.64) |
| Neonatal death <7 days | 43 4 9 10 | 0% | 1.06 (0.72 to 1.56) |
| Neonatal death <28 days | 24 9 | 0% | 1.06 (0.72 to 1.55) |
| NICU admission | 33 9 10 | 0% | 0.69 (0.61 to 0.79) |
| Apgar <7 at five minutes | 43 4 9 10 | 0% | 0.70 (0.64 to 0.77) |
| Unassisted vaginal birth | 53-5 9 10 | 99% | 1.04 (0.98 to 1.10) |
| Instrumental birth | 43-5 10 | 83% | 0.34 (0.16 to 0.74) |
| Unplanned caesarean | 53-5 10 16 | 84% | 0.30 (0.13 to 0.66) |
| Severe perineal trauma | 53-5 10 16 | 0% | 0.62 (0.50 to 0.76) |
| Manual removal of the placenta | 28 16 | 33% | 0.50 (0.27 to 0.95) |
| Postpartum haemorrhage >=500 mL | 24 10 | 87% | 0.43 (0.19 to 0.95) |
| Postpartum haemorrhage >=1000 mL | 45 8 10 16 | 4% | 0.54 (0.48 to 0.62) |

**Table 3. Studies reporting transfer rates**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Citation | Country | By parity | Sample size | Transfers reported |
| Birthplace in England 20113 | England | Yes | 16 840 | Intrapartum  Postpartum |
| Blix 20124 | Norway | Yes | 1631 | Intrapartum  Postpartum |
| Bolten 20165 | Netherlands | Yes | 2050 | Intrapartum  Postpartum |
| Halfdansdottir 201510 | Iceland | Yes | 278 | Not specified |
| Homer 201411 | Australia | Yes | 742 | Not specified |
| Davies-Tuck 201815 | Australia | Yes | 3202 | Intrapartum |
| Dixon 201418 | New Zealand | Yes | 4921 | Not specified |
| Hiraizumi 201320 | Japan | No | 168 | Combined Transfer |
| Miller 201221 | New Zealand | No | 109 | Intrapartum  Postpartum |
| Blix 201624 | Norway Sweden Denmark  Iceland | Yes | 3068 | Intrapartum  Postpartum |
| Amelink-Verburg 200725 | The Netherlands | Yes | 280 097 | Combined |
| McMurthie 200926 | Australia | No | 100 | Intrapartum  Postpartum |
| Maimburg 201827 | Denmark | Yes | 268 | Intrapartum  Postpartum |

# Appendix 1: List of included studies

| ID | Citation | Country | | Study type | | Source data | | Years | | Low risk population definition | | Sample size | | Quality (ResQu index) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Birthplace in England Collaborative 20113 | England | | Prospective cohort study | | Data collection forms. | | 2008–2010 | | Women with low-risk pregnancies. No known medical or obstetric factors from NICE guidelines  Exclusion criteria: No planned section, or section before onset of labour, preterm gestations, multiple pregnancy or with no antenatal care | | HB: 16 840  OU: 19 706 | | High |
| 2 | Blix 20124 | Norway | | Retrospective cohort study | | Patient files + registry data. | | 1990–2007 | | Low-risk pregnancies (Spontaneous onset of labour, a singleton fetus, gestational age between 37 and 42 weeks, no chronic medical diseases before pregnancy, no complications in pregnancy, no previous caesarean section or fetal death before onset of labour. | | HB: 1631  OU: 16 310 | | High |
| 3 | Bolten 20165 | Netherlands | | Prospective cohort study | | Perinatal database + participant questions | | 2009–2011 | | Women with low-risk pregnancies (woman in good general health and uncomplicated medical and obstetric history) in MW care at onset of labour | | HB: 2050  OU: 1445 | | High |
| 4a  4b | Davis 20116  Davis 20127 | New Zealand | | Comparative descriptive study | | Perinatal database | | 2006–2007 | | Low risk pregnancies  Exclusion criteria: Complicated past pregnancy or medical/surgical history. Complicated current pregnancy, preterm or post-term gestation, induced labour, breech/shoulder presentations, transverse or planned caesarean | | HB: 1830  PU: 2877  Sec H: 7830  Tertiary: 4123 | | High |
| 5 | de Jonge 20138 | Netherlands | | Linked cohort study | | Perinatal database +  LEMMoN study data | | 2004–2006 | | Women with low risk pregnancies (Singleton pregnancy, fetus in cephalic presentation with no medical or obstetric risk factors including no prior caesarean, at a term gestation and spontaneous onset of labour) | | HB: 92 333  OU: 54 419 | | High |
| 6 | de Jonge 20159 | Netherlands | | Retrospective cohort study | | Linked national registry data | | 2000–2009 | | Women with low risk pregnancies (Singleton pregnancy, fetus in cephalic presentation with no medical or obstetric risk factors including no prior caesarean, at a term gestation and spontaneous onset of labour) | | HB: 466 112  OU: 276 958 | | High |
| 7 | Halfdansdottir 201510 | Iceland | | Retrospective cohort study – matched. Two methods | | Hospital data + registry data. | | 2005–2009 | | Low risk women. Contradictions to planned homebirth were excluded from all groups. | | HB: 278  OU: 834 | | High |
| 8 | Homer 201411 | Australia | | Retrospective population- based cohort study | | Linked registry +  hospital data. | | 2000–2008 | | Women with low risk pregnancies (singleton baby in cephalic position, spontaneous onset at>37 weeks gestation).  Exclusion criteria: Elective caesarean, baby born before arrival to hospital, preterm gestation, no antenatal care, prior caesarean, baby with congenital anomaly, induced labour | | HB: 742  OU: 242 936 | | High |
| 9 | Nove 201212 | UK | | Observational study | | Secondary analysis of maternity data | | 1988–2000 | | Low risk women  Exclusion criteria: miscarriages and terminations, high risk pregnancy according to NICU guidelines, induced labour, elective caesarean, preterm gestation, unknown place of birth, unattended labour, baby of indeterminate sex. | | HB: 5998  OU: 267 874 | | High |
| 10a  10b | van der Kooy 201113  van der Kooy 201714 | Netherlands | | Population-based cohort | | Perinatal Registry data. | | 2000–2007 | | Low risk pregnancies in MW care with spontaneous onset of labour.  Exclusion criteria: Women with medium risk (history of PPH, BMI>30) | | HB: 402 912  OU: 219 105 | | High |
| 11 | Davies-Tuck 201815 | Australia | Retrospective cohort study | | Perinatal Registry data | | 2000–2015 | | Low risk women according to ACM guidelines at the onset of labour with a privately practicing midwife  Exclusion criteria: Babies with congenital abnormalities, planned caesarean, public funded homebirth models, multiple pregnancy, preterm or post term gestation, non-cephalic presentation, BMI class 2 or greater, prior caesarean, significant medical or obstetric condition. | | HB: 3202  OU: 701 058 | | High | |
| 12 | Hermus 201716 | Netherlands | Prospective cohort study | | Dutch Birthcentre study | | July 2013-Dec 2013- | | Low risk women under care of community midwife (term gestation)  Exclusion criteria: Medium risk women (D-indications according to List of Obstetric Indications Guidelines) or women who did not have a specific choice about planned place of birth. | | HB 1086  OU: 701 | | High | |
| 13 | Homer et al., 201917 | Australia | Retrospective cohort study | | Perinatal Registry data | | 2000-2012 | | Women with uncomplicated pregnancies, singleton baby in cephalic presentation between 37 and 41 completed weeks’ gestation. | | HB: 8212  OU:1 171 703 | | High | |
| 14 | Dixon 201418 | New Zealand | Retrospective cohort | | NZ College Midwives Research Data | | 2006–2010 | | Low risk women with a singleton pregnancy, cephalic presentation and term gestation.  Exclusion criteria: Not booked with a midwife, planned elective caesarean, unplanned homebirth, body mass index>35 and medical or obstetric risk factors. | | HB: 4921  OU: 10 158 | | Moderate | |
| 15 | Wiegerinck, 201519 | Netherlands | Retrospective cohort study | | Linked admin + Registry data. | | 2005–2008 | | Women with singleton term pregnancies no elective CS, congenital abnormality or fetal death, at all risk levels. Additional data on women with low-risk pregnancies provided in Appendices | | HB: 23 323  OU: 29 306 | | Moderate | |
| 16 | Hiraizumi 201320 | Japan | Retrospective cohort study | | Medical records | | 2007–2011 | | Low risk women at term gestation.  Exclusion criteria: Complicated medical, gynaecological or obstetric history, multiple pregnancy, non-vertex presentation, maternal BMI >=25, anemia, epilepsy, polyhydramnious, oligohydramnios, low lying placenta, placenta previa, fetal growth restriction, large for gestational age, GDM and gestational hypertension, and labour complications. | | HB 168  OU 123 | | Moderate | |
| 17 | Miller 201221 | New Zealand | Retrospective matched case control study | | Questionnaires to MW. | | 2006–2007 | | Nulliparouswomen with low-risk pregnancies (Spontaneous onset of labour at term with a singleton baby and no risk factors for higher level care) | | HB: 109  OU: 116 | | Moderate | |
| 18 | Pang 200222 | USA | Retrospective population-based cohort study | | Birth registry data, linked with death records | | 1989–1996 | | Singleton birth 34/40 + with no recorded pregnancy complications (Anaemia, cardiac disease, lung disease, polyhydramnios, oligohydramnious, genital herpes, hemoglobinopathy, chronic hypertension, gestational hypertension, eclampsia, incompetent cervix, previous preterm or SGA, previous macrosomia, renal disease, Rh sensitization, syphilis and hepatitis B infection.  Additional analysis restricted only to term births. | | HB: 6052  OU: 10 201 | | Low | |

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