Supplementary file: Appendices

Table of Contents

Appendix 1: Study protocol

The Birthplace in England Research Programme: study protocol for the Birthplace national prospective cohort study of planned place of birth

Background

Maternity services in England are provided by the NHS and are free of charge at the point of care. NHS midwives and doctors provide care for more than 99% of all births.[1]

Since the Changing Childbirth report in 1993, maternity care policy has aimed to be responsive to women's needs and enable women to make informed choices about their care.[2] This policy direction has continued with the Maternity Standard of the National Service Framework (NSF) for Children, Young People and Maternity Services.[3] Maternity Matters, the implementation plan for the NSF, consolidated this policy direction for maternity care and stated that by the end of 2009, depending on their circumstances, a woman and her partner should be able to choose where they wish to give birth: at home, in a local midwifery unit or in an obstetric unit.[4]

Reviews of research have identified that there is no accurate quantification of the risk of adverse outcomes associated with births planned in the different settings. One major problem in interpreting much of the evidence is that actual place of birth is often used to make inferences about planned place of birth.[5-8]

Birth at home

A Cochrane systematic review of home versus hospital birth identified only one randomised controlled trial which included 11 women and was unable to detect any differences in safety or other outcomes between the two settings.[9] A meta-analysis of six observational studies examined perinatal outcomes for 24,092 'low risk' women and their babies.[10] No difference was observed for perinatal mortality. However, there was evidence that women planning birth at home had a lower risk of induction, augmentation, instrumental vaginal birth, caesarean section, episiotomy, severe perineal lacerations and that their babies were less likely to have low Apgar scores.

The results of several large observational studies comparing home births with birth in an obstetric unit have been published since the Birthplace Research Programme began in 2007. A retrospective cohort study from the Netherlands using routine data from over 500,000 women found no evidence of a difference in perinatal mortality or morbidity between 'low risk' women who planned to give birth at home and 'low risk' women who planned to give birth in hospital.[11] Canadian and Swedish studies of planned home births compared to planned hospital births for 'low risk' women also showed no difference in perinatal mortality.[12, 13] Lower rates of obstetric interventions were observed in the planned home birth group for both studies. However, both studies included fewer than 20,000 births and lacked statistical power to demonstrate differences in rare but important adverse outcomes. A study from England and Wales attempted to quantify the intrapartum-related perinatal mortality rates for booked home births from 1994 to 2003 using routine statistics.[14] However, the data available were of poor quality for this comparison and highlighted the need for a more accurate quantification of the risks associated with each planned place of birth. A recent meta-analysis found planned home births, compared to planned hospital births, were associated with less medical intervention, had a similar perinatal mortality rate and an increased neonatal mortality rate.[15] This study has been criticized for failing to report the assessment of the quality of the studies included.[16]

Births in midwifery units

NHS midwifery units provide midwife-led care for women who are at 'low risk' of complications at the start of care in labour.[17] Freestanding midwifery units are on a site geographically separate from an obstetric unit. Alongside midwifery units are in the same building or on the same site as an obstetric unit.

A Cochrane systematic review comparing birth in alternative birth settings with conventional institutional settings (obstetric units) included nine randomised controlled trials and 10,684 women.[18] The alternative birth settings had features in common with the units that we define as alongside midwifery units. The alternative birth settings were associated with an increased likelihood of spontaneous vaginal birth, increased maternal satisfaction and fewer medical interventions during labour and birth. There was no association between birth setting and severe perinatal morbidity or mortality. Also, there was no association between birth setting and serious maternal morbidity or mortality. However, it is likely that the review was underpowered to detect any

differences in rare but important severe adverse perinatal and maternal outcomes. No trials of freestanding midwifery units were included in the review.

Prospective observational studies show a lower rate of intervention during labour for births planned in free-standing midwifery units.[8, 19]

It is difficult to draw clear conclusions about the effect of planned place of birth on outcomes due to differences in the health care systems in which studies were undertaken, the heterogeneity of studies, poor study design and the use of varied outcome measures. High quality evidence about the risks and benefits associated with the different settings for birth should be available to women. The National Institute for Health and Clinical Excellence's (NICE) clinical guidance on Intrapartum Care included guidance on planning place of birth and stated that "Of particular concern is the lack of reliable data, relating to relatively rare but serious outcomes such as perinatal mortality that is directly related to intrapartum events or serious maternal morbidity in all places of birth".[20] It is in this context that the Birthplace in England Research Programme has been designed to compare the safety of the settings for birth supported by the NHS in England (http://www.npeu.ox.ac.uk/birthplace).

Aim
To compare aspects of the safety of birth by planned place of birth at the start of care in labour: at home, in freestanding midwifery units, in alongside midwifery units and in obstetric units in England.

Primary objective
To compare intrapartum and early neonatal mortality and specific neonatal morbidities for births planned at home, in freestanding midwifery units and in alongside midwifery units with births planned in obstetric units, for babies of women judged to be at 'low risk' of complications at labour onset.

Using births planned in obstetric units as the reference group will maximise statistical efficiency as the highest number of births will be included from these units. This does not imply obstetric units are assumed to be the standard or optimal places of care.

Secondary objectives
To compare the following for births planned at home, in freestanding midwifery units and in alongside midwifery units with births planned in obstetric units:

1. Maternal morbidity for women judged to be at 'low risk' of complications at labour onset
2. Intrapartum and early neonatal mortality and specific neonatal morbidities for babies of all women, irrespective of risk status at labour onset.
3. Maternal morbidity for all women, irrespective of risk status at labour onset.
4. Intrapartum and early neonatal mortality and specific neonatal morbidities for babies of women at 'higher risk' of complications at labour onset.
5. Maternal morbidity for women at 'higher risk' of complications at labour onset.
6. Maternal birth interventions for women judged to be at 'low risk' of complications at labour onset.

Also, using the planned birth at home group as the comparison group:

7. To compare perinatal and maternal outcomes for 'low risk' women who transfer from home, freestanding midwifery units and alongside midwifery units, during or immediately after labour.
8. To quantify any associations between indication for transfer, time from decision making until transfer, duration of transfer or events after transfer (including the time taken to be assessed by an obstetrician) and perinatal or maternal outcomes for babies and women who are transferred during or immediately after labour.

Design
The study design is a prospective cohort study with planned place of birth at the start of care in labour as the exposure and a composite measure of intrapartum and early neonatal mortality and specific neonatal morbidities as the primary outcome.

Definitions
'Low risk': Women will be classified as 'low risk' if they do not have any of the medical conditions or situations listed in the NICE Intrapartum Care guidelines that result in "increased risk for the woman or baby during or shortly after labour, where care in an obstetric unit would be expected to reduce this risk".[20] These risk factors are listed on page 4 of the Birthplace data collection form.

'Higher risk': Women will be classified as 'higher risk' if they have any of the medical conditions or situations listed in the NICE Intrapartum Care guidelines.

Births planned at home: a birth which occurs for a woman who, at the start of care in labour, intended to give birth at home and who received care from a midwife during established labour at home, regardless of where the woman actually gives birth. This includes women who make their final decision about planned place of birth during labour.

Births planned in a freestanding midwifery unit: a birth which occurs for a woman who, at the start of care in labour, intended to give birth in a freestanding midwifery unit and who received care from a midwife during established labour in a freestanding midwifery unit, regardless of where the woman actually gives birth. Freestanding midwifery units are defined as being on a separate geographical site from an obstetric unit and transfer will normally be by ambulance or car.[21]

Births planned in an alongside midwifery unit: a birth which occurs for a woman who, at the start of care in labour, intended to give birth in an alongside midwifery unit and who received care from a midwife during established labour in an alongside midwifery unit, regardless of where the woman actually gives birth. Alongside midwifery units are defined as being in the same building or on the same geographical site as an obstetric unit and transfer will normally be by trolley, bed or wheelchair.[21]

Births planned in an obstetric unit: a birth which occurs for a woman who, at the start of care in labour, intended to give birth in an obstetric unit and who received care from a midwife during established labour in an obstetric unit.

Inclusion criteria
All women who are attended by an NHS midwife during labour in their planned place of birth, for any amount of time, are eligible for inclusion in the study except for:

- women who have a caesarean section before the start of labour
- women who present in labour before 37 weeks and 0 days gestation
- women with a multiple pregnancy
- women who have had no antenatal care

Data will be collected for all women planning birth at home, in a freestanding midwifery unit or in an alongside midwifery unit who are attended by an NHS midwife during labour. Women with any of the exclusion criteria listed above will not be included in the analyses.

Data will not be collected for women who have an unplanned birth at home.

Study sites
The aim is to collect data about planned home births in every NHS trust in England. All midwifery units in England, both freestanding and alongside, will be invited to participate and a stratified random sample of thirty seven obstetric units will be invited to participate. Obstetric units will be stratified by size (<2600 births, 2600-4850 births and >4850 births per year) and geographic location (northern England or southern England). Data from the Department of Geography at the University of Sheffield were used to define northern and southern England.[22] The classification of obstetric units as northern or southern and the size categories were chosen to help ensure that the sample is broadly representative of obstetric units in England. Data from a national mapping survey of all NHS trusts providing maternity care in England provided the sampling frame for the selection of the obstetric units. These mapping data were collected as part of the Birthplace Research Programme in collaboration with the Healthcare Commission's review of maternity services in 2007.[23]

Research ethics approval
The Berkshire Research Ethics Committee gave approval for the study in October 2007 (reference number: 07/H0505/151). An amendment to the original protocol was approved by a sub-committee of the Berkshire Research Ethics Committee in April 2008.

As part of the approval, individual women will not be asked to give consent to participate. All of the data that will be collected are routinely recorded in the maternity, postnatal or neonatal notes and no personally identifiable data will be sent to the study coordinating centre. In addition, the process of seeking and obtaining

consent would be likely to introduce substantial bias in the composition of the comparison groups and the care women receive will not change in any way as a result of the study.

Primary outcome
The primary outcome is a composite outcome of stillbirth after the start of care in labour, early neonatal death (<7 days), neonatal encephalopathy defined as either a clinical diagnosis of neonatal encephalopathy or admission to a neonatal unit within 48 hours of birth for at least 48 hours with evidence of feeding difficulties or respiratory distress, meconium aspiration syndrome, brachial plexus injury, fractured humerus or clavicle.

A composite outcome will give the study more power to detect differences in safety between planned places of birth than a single outcome, which would have a lower incidence. The results could be misleading if the exposure affects different outcomes in different ways. For example, if the effect of planned place of birth in a particular setting decreased deaths but resulted in increased significant morbidity there might be no difference observed in the primary outcome, even though deaths were being prevented in one setting. The likelihood of this occurring is small and the increased statistical power of using a composite outcome outweighs the alternative approach of substantially increasing the sample size to address individual components of the primary outcome.

The signs of mild encephalopathy can be subtle and include respiratory difficulty and poor feeding rather than features more specifically associated with encephalopathy. Since this is a mature group of babies, any difference in the incidence of neonatal unit admissions for these outcomes is likely to result from differences in the incidence of perinatal asphyxia.

Secondary outcomes
The perinatal outcomes that will be investigated are stillbirth after the start of care in labour; early neonatal death (<7 days); a clinical diagnosis of neonatal encephalopathy or admission to a neonatal unit within 48 hours of birth for at least 48 hours with evidence of feeding difficulties or respiratory distress; a clinical diagnosis of neonatal encephalopathy; admission to a neonatal unit within 48 hours of birth for at least 48 hours with evidence of feeding difficulties or respiratory distress; meconium aspiration syndrome; brachial plexus injury; fractured humerus; fractured clavicle; fractured skull; cephalohaematoma; cerebral haemorrhage; early onset neonatal sepsis (within 48 hours of birth); kernicterus (severe bilirubin encephalopathy); seizures; neonatal unit admission; Apgar score less than seven at five minutes; and breastfeeding initiation.

Only diagnosed fractures will be included. Minor fractures, particularly of the clavicle, are often missed and have little or no clinical significance.

The maternal outcomes that will be investigated are mode of birth; normal birth; third or fourth degree perineal trauma; blood transfusion; admission to an intensive therapy unit, high dependency unit or specialist unit; and maternal death (within 42 days of giving birth).

The interventions in labour that will be investigated are syntocinon augmentation; immersion in water for pain relief; epidural or spinal analgesia; general anaesthetic; active management of the third stage of labour; and episiotomy.

Normal birth is defined as a birth with none of the following interventions: induction of labour; epidural or spinal analgesia; general anaesthetic; forceps or ventouse; caesarean section; episiotomy.[24]

Data collection
Data collection will be coordinated by the National Perinatal Epidemiology Unit at the University of Oxford. A National Lead Research Midwife and four Regional Lead Midwives will train a local coordinator at each unit. Study documentation and data collection forms will be posted to each local coordinator from the coordinating centre in Oxford. Contact with each of the study coordinators will be maintained throughout the data collection period by phone, email, regional meetings and site visits by the National and Regional Lead Midwives.

Local coordinators will manage data collection within their trust (for home births) or unit. The majority of local coordinators will be midwives from the trust or unit. The local coordinators will be responsible for running Birthplace within their trust or unit: ensuring that all midwives are informed about Birthplace and have access to data collection forms, keeping a record of the number of eligible women, collecting completed data collection forms from their midwives, checking over data collection forms for completeness, posting completed data collection forms for data entry and responding to any data queries sent from the coordinating centre.

The attending midwife will start a data collection form for each eligible woman during labour care and the forms will be completed after the birth, using information recorded in the woman's maternity notes. Outcomes for women and babies who are transferred from their planned place of birth during or immediately after labour will also be collected.

More detailed information will be collected on mothers and babies that have morbidity identified. An extra data collection form will be used to measure the severity of the adverse outcomes and the resources used to care for these women and babies (supplementary data file 2). These forms will be completed using the maternal and neonatal notes, with help from the neonatal team when necessary.

To ensure as many eligible women as possible are included, the number of women included from each site will be compared with appropriate local records, including records of planned home births, delivery suite and theatre registers and records of transfers to obstetric care. Many trusts do not keep comprehensive records of women planning to give birth at home. For this reason, the local coordinator responsible for collecting data on planned home births in each trust will keep a prospective register of all women eligible for Birthplace. These registers will provide further assurance that the majority of eligible women are identified and included.

Data for eligible women who are missed will be collected retrospectively, using the maternal and neonatal notes as necessary. Double data entry will be used to minimize data entry errors.

Sample size

Major perinatal and maternal morbidity are rare in women judged to be at 'low risk' of complications at the start of care in labour. The incidence of neonatal encephalopathy at term is approximately 1.8 per 1,000 live births.[25] However, the incidence of intrapartum stillbirth after labour onset, early neonatal death and other related neonatal morbidity at term for babies of women at 'low risk' of complications at the start of care in labour is much less certain. A reasonable estimate of the incidence of the composite primary outcome is 3.6 per 1,000 births. As the vast majority of data on neonatal morbidity are from obstetric units, this estimate is assumed to be the incidence of the primary outcome in obstetric units.

In order to have adequate power to detect clinically important differences in outcome that are associated with planned place of birth, the study will need to collect data on at least 20,000 'low risk' women planning to give birth in an obstetric unit, at least 17,000 women planning to give birth at home and at least 5,000 women planning to give birth in each type of midwifery unit.

The study aims to collect data on at least 85% of all eligible women planning birth at home over approximately 16 months, which we estimate to be 17,000 women. With data from 17,000 planned home births, it will be possible to detect an increase in the incidence of the primary outcome from 3.6 per 1,000 births in obstetric units to 5.7 per 1,000 for planned home births, with a 5% two-sided level of significance and 82% power. Alternatively, the study will be able to detect a reduction in the incidence of the primary outcome from 3.6 per 1,000 births in obstetric units to 2.0 per 1,000 births for planned home births, with a 5% two-sided level of significance and 80% power.

Data collection is planned for at least 6 months in each type of midwifery unit, which will allow a minimum of 5,000 women from each type of unit to be included. Freestanding and alongside midwifery units will be analysed separately when being compared to obstetric units. With 5,000 women included from each type of midwifery unit, the study will be able to detect an increase in the incidence of the primary outcome from 3·6 per 1,000 births in obstetric units to 6·8 per 1,000 in midwifery units, with a 5% two-sided level of significance and 80% power. Alternatively, the study will be able to detect a reduction in the incidence of the primary outcome from 3·6 per 1,000 births in obstetric units to 1·2 per 1,000 births in midwifery units, with a 5% two-sided level of significance and 80% power.

The study will also be able to detect much more modest differences in relatively common serious outcomes of maternal morbidity amongst women at 'low risk' of complications, such as blood transfusion which affects approximately 0·5% of women, and 3rd and 4th degree perineal trauma which is experienced by 1·2% of women.[26, 27]

Analysis

Categorising data by women's planned place of birth at the start of care in labour is appropriate because risk assessment and transfer are important elements of the quality of care provided to women planning birth out of hospital. The characteristics of the women who planned birth in each setting will be described. Odds ratios will be calculated to compare outcomes by planned place of birth using the obstetric unit women as the reference comparison group. Crude odds ratios will be presented for the primary outcome with 95% confidence intervals. These crude odds ratios will be adjusted in a logistic regression model to take account of potential confounders such as maternal age, ethnic group, understanding of English, marital or partner status, BMI in pregnancy, index of multiple deprivation score, parity and gestation at delivery. The analysis will be weighted to take into account the duration of each home birth trust's and each unit's participation. The clustered nature of the data, within trusts for home births and within units for the other settings, will be taken into account in the analysis. Taking these factors into account will ensure that accurate point estimates and confidence intervals are obtained.

Secondary outcomes will be analysed in the same way as the primary outcome. Odds ratios calculated for the secondary outcomes will be presented with 99% confidence intervals. Since a large number of comparisons will be made it is important to use wider confidence intervals to reduce the likelihood of finding statistically significant associations by chance.

A predefined subgroup analysis will be performed based on outcomes stratified by parity, nulliparous and multiparous. A test for heterogeneity will be performed to investigate whether any differences in outcomes, by planned place of birth, between nulliparous and multiparous women are likely to have been due to chance.

For the primary outcome, a number of sensitivity analyses will be performed to assess the robustness of the results to factors which may introduce bias. These will include: i) restricting the analysis to centres that provided data for at least 85% of eligible women; ii) using propensity score methods for a stratified or restricted analysis based on the likelihood of women giving birth in each setting; and iii) using multiple imputation to include women who have data missing for any of the potentially confounding variables about their characteristics.

Further exploratory analysis will be performed to generate hypotheses for future research.

References

1. Office for National Statistics. Birth statistics: Births and patterns of family building England and Wales (FM1 No. 36 – 2007). Newport: 2008.
2. Department of Health. Changing Childbirth, Part 1: Report of the Expert Maternity Group. London: 1993.
3. Department of Health. National Service Framework for Children, Young People and Maternity Services. Standard 11: Maternity Services. London: 2004.
4. Department of Health/Partnerships for Children Families and Maternity. Maternity Matters: Choice, access and continuity of care in a safe service. London: 2007.
5. Campbell R, Macfarlane A. Place of delivery: a review. Br J Obstet Gynaecol. 1986 Jul;93(7):675-83.
6. Campbell R, Macfarlane A. Where to be Born? The debate and the evidence. 2nd ed. Oxford: National Perinatal Epidemiology Unit; 1994.
7. MIDIRS. Place of Birth Informed Choice Leaflet. Bristol: 2005.
8. Stewart M, McCandlish R, Henderson J, Brocklehurst P. Review of evidence about clinical, psychosocial and economic outcomes for women with straightforward pregnancies who plan to give birth in a midwife-led birth centre, and outcomes for their babies. Report of a structured review of birth centre outcomes. Revised 2005. Oxford: National Perinatal Epidemiology Unit: 2004.
9. Olsen O, Jewell MD. Home versus hospital birth. Cochrane Database of Systematic Reviews. 1998(3):CD000352.
10. Olsen O. Meta-analysis of the safety of home birth. Birth. 1997 Mar;24(1):4-13.
11. de Jonge A, van der Goes BY, Ravelli AC, Amelink-Verburg MP, Mol BW, Nijhuis JG, et al. Perinatal mortality and morbidity in a nationwide cohort of 529,688 low-risk planned home and hospital births. BJOG. 2009 Aug;116(9):1177-84.
12. Janssen PA, Saxell L, Page LA, Klein MC, Liston RM, Lee SK. Outcomes of planned home birth with registered midwife versus planned hospital birth with midwife or physician. CMAJ. 2009 Sep 15;181(6-7):377-83.
13. Lindgren HE, Radestad IJ, Christensson K, Hildingsson IM. Outcome of planned home births compared to hospital births in Sweden between 1992 and 2004. A population-based register study. Acta Obstet Gynecol Scand. 2008;87(7):751-9.
14. Mori R, Dougherty M, Whittle M. An estimation of intrapartum-related perinatal mortality rates for booked home births in England and Wales between 1994 and 2003. BJOG. 2008 Apr;115(5):554-9.
15. Wax JR, Lucas FL, Lamont M, Pinette MG, Cartin A, Blackstone J. Maternal and newborn outcomes in planned home birth vs planned hospital births: a metaanalysis. Am J Obstet Gynecol. 2010 Sep;203(3):243 e1-8.
16. Gyte G, Dodwell M, Newburn M, Sandall J, Macfarlane A, Bewley S. Safety of planned home births. Findings of meta-analysis cannot be relied on. BMJ. 2010;341:c4033.
17. Department of Health. Improvement, expansion and reform - the next 3 years: priorities and planning framework 2003-2006: Department of Health: 2002.
18. Hodnett ED, Downe S, Walsh D, Weston J. Alternative versus conventional institutional settings for birth. Cochrane Database Syst Rev. 2010;9:CD000012.
19. Walsh D, Downe SM. Outcomes of free-standing, midwife-led birth centers: a structured review. Birth. 2004 Sep;31(3):222-9.
20. National Collaborating Centre for Women's and Children's Health. Intrapartum care: care of healthy women and their babies during childbirth. London: 2007.
21. McCandlish R, Rowe R. The Birthplace in England Research Programme Report of Component Study 1: Terms and Definitions. 2007; Available from: https://**www.npeu.ox.ac.uk/birthplace/component-studies/tdc**.
22. Dorling D. The North-South Divide. University of Sheffield; 2007 [12 October 2007]; Available from: **http://sasi.group.shef.ac.uk/maps/nsdivide/index.html**.

23. Healthcare Commission. Towards better births: A review of maternity services in England. London: Commission for Healthcare Audit and Inspection: 2008.
24. Maternity Care Working Party. Making normal birth a reality: NCT, RCM & RCOG: 2007.
25. Kurinczuk J, Barralett J, Redshaw M, Brocklehurst P. Monitoring the incidence of neonatal encephalopathy - what next? Report to the Patient Safety Research Programme. Oxford: NPEU: 2005.
26. McCandlish R, Bowler U, van Asten H, Berridge G, Winter C, Sames L, et al. A randomised controlled trial of care of the perineum during second stage of normal labour. Br J Obstet Gynaecol. 1998 Dec;105(12):1262-72.
27. Rogers J, Wood J, McCandlish R, Ayers S, Truesdale A, Elbourne D. Active versus expectant management of third stage of labour: the Hinchingbrooke randomised controlled trial. Lancet. 1998 Mar 7;351(9104):693-9.

Appendix 2: Outcome variables requiring clinical review and coding

Neonatal encephalopathy
Neonatal encephalopathy was defined as either a clinical diagnosis of neonatal encephalopathy or 'signs of neonatal encephalopathy':

- A clinical diagnosis of neonatal encephalopathy was defined as either a clinical diagnosis of neonatal encephalopathy or a clinical diagnosis of isolated seizures without a known cause other than perinatal asphyxia.
- 'Signs of neonatal encephalopathy' was defined as admission to a neonatal unit within 48 hours of birth for at least 48 hours with signs consistent with a diagnosis of neonatal encephalopathy:
    - receipt of parenteral or tube feeding or receipt of supplemental oxygen or respiratory support; and
    - absence of meconium aspiration, suspected or confirmed sepsis or other diagnosis consistent with feeding difficulties or need for respiratory support.

The components of the neonatal encephalopathy outcome involving isolated seizures and signs of neonatal encephalopathy were coded based on clinical review of the neonatal morbidity form data, blinded to planned place of birth.

- Diagnoses and other details recorded on the neonatal form for babies with isolated seizures but without a confirmed diagnosis of neonatal encephalopathy were reviewed by a clinician and where no cause of the seizures other than presumed asphyxia could be identified a clinical diagnosis of neonatal encephalopathy was coded as the outcome.
- Diagnoses, reasons for neonatal unit admission and other details recorded on the neonatal form for babies meeting the admission and feeding difficulties or respiratory support criteria (excluding those with a confirmed diagnosis of neonatal encephalopathy) were reviewed by a clinician and where the clinician judged that there was no alternative diagnosis consistent with feeding difficulties or need for respiratory support 'signs of neonatal encephalopathy' was coded as the outcome.

Early onset neonatal sepsis
Because of potential misclassification of unconfirmed cases of suspected neonatal sepsis, the outcome was defined as culture confirmed early onset neonatal sepsis. The outcome variable was derived from the morbidity form data using the date of diagnosis of sepsis in combination with responses to the questions relating to a positive blood culture, evidence of infection in the cerebrospinal fluid (CSF) or a positive culture from another usually sterile site.

Kernicterus
The details of purported cases of kernicterus recorded in section I of the neonatal morbidity form were reviewed by a neonatologist blinded to planned place of birth. Cases where the serum bilirubin and treatment details were inconsistent with a diagnosis of kernicterus were recoded to 'No kernicterus'.

Appendix 3: Data collection forms

Data collection forms included

- Planned home birth data collection form
- Planned obstetric unit data collection form
- Obstetric unit transfer form
- Multiple maternal transfer form
- Neonatal morbidity form
- Maternal morbidity form

Data collection forms
The planned home birth, FMU, and AMU data collection forms were almost identical. The planned home birth form included one extra question: D1 "Did this woman make her final decision about place of birth during labour?" The planned home birth form also had an extra option for question E3, which was about the date and time of maternal discharge: "Not applicable, delivered at home".

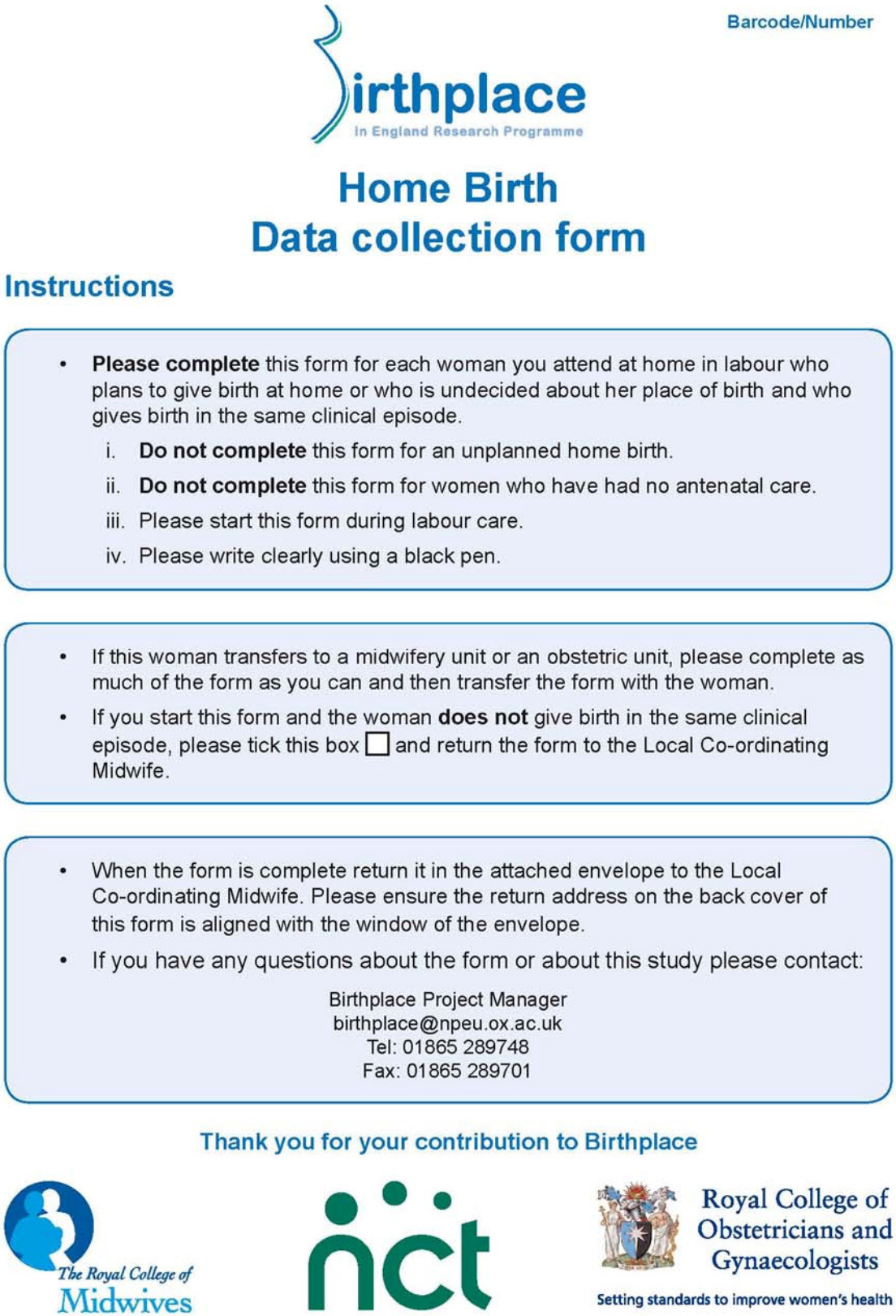
The OU data collection form had four extra eligibility questions, A1 to A4, which were used to exclude women with a caesarean section before the onset of labour, a multiple pregnancy, a gestation of 36^{+6} weeks or less, and unbooked women (ie women who did not have any antenatal care). Also, the OU form did not have a section to collect detailed information about transfers during labour or immediately after the birth.

Obstetric unit transfer form
This form was used to confirm transfers where they had been recorded on an OU data collection form and to collect more detailed information about these transfers.

Multiple maternal transfer form
This form was used to confirm cases where it was recorded that more than one transfer took place during labour and birth and to collect more detailed information about these transfers.

Morbidity forms
These forms were used to confirm neonatal and maternal morbidities and to collect more detailed information about adverse neonatal and maternal outcomes.

Figure 4.1: Planned home birth data collection form



Barcode/Number

Birthplace
In England Research Programme

Home Birth
Data collection form

Instructions

- **Please complete** this form for each woman you attend at home in labour who plans to give birth at home or who is undecided about her place of birth and who gives birth in the same clinical episode.
  i. **Do not complete** this form for an unplanned home birth.
  ii. **Do not complete** this form for women who have had no antenatal care.
  iii. Please start this form during labour care.
  iv. Please write clearly using a black pen.

- If this woman transfers to a midwifery unit or an obstetric unit, please complete as much of the form as you can and then transfer the form with the woman.
- If you start this form and the woman **does not** give birth in the same clinical episode, please tick this box ☐ and return the form to the Local Co-ordinating Midwife.

- When the form is complete return it in the attached envelope to the Local Co-ordinating Midwife. Please ensure the return address on the back cover of this form is aligned with the window of the envelope.
- If you have any questions about the form or about this study please contact:

Birthplace Project Manager
birthplace@npeu.ox.ac.uk
Tel: 01865 289748
Fax: 01865 289701

Thank you for your contribution to Birthplace

The Royal College of Midwives

nct

Royal College of Obstetricians and Gynaecologists
Setting standards to improve women's health

Birthplace
In England Research Programme

Section A: Woman's identifying details

This page will be detached from the rest of the form and kept in a secure location in your Trust by the Local Co-ordinating Midwife (LCM). This allows the LCM to deal with any inconsistencies or mistakes in the form or find missing information before sending non-identifying information (pages 2-6) to the study team in Oxford.

Please stick woman's address label here:

OR complete the following details:

A1. Woman's full name: *Please print* _____

A2. Woman's date of birth: D D / M M / Y Y

A3. Woman's NHS number:

A4. Woman's home address: *Please print*

_____

_____

_____

_____

A5. Woman's full postcode:

A6. Section A completed by: *Please print full name* _____

Office use only

After birth

Please fill in this box once the labour episode is complete

A7. Date of delivery: D D / M M / Y Y

A8. Baby's NHS number: *(If known)*

Birthplace Home Birth
In England Research Programme

Section B: Woman's details

B1. Woman's age at delivery: *(Years)* ☐☐

B2. Woman's ethnic group: *(As recorded in her maternity notes)*

☐☐ *Please write in one code from the list below*

01 White British	09 Pakistani
02 White Irish	10 Bangladeshi
03 Any other White background	11 Any other Asian background
04 Mixed White & Black Caribbean	12 Black Caribbean
05 Mixed White & Black African	13 Black African
06 Mixed White & Asian	14 Any other Black background
07 Any other Mixed background	15 Chinese
08 Indian	16 Any other ethnic group

B3. Woman's understanding of English language:

☐1 Fluent

☐2 Some understanding / Able to communicate verbally

☐3 No understanding / Not able to communicate verbally

B4. Woman's marital / partner status:

☐1 Married / Living with a partner

☐2 Single / Unsupported by partner *(this includes single woman living with family)*

B5. Woman's BMI in pregnancy: ☐☐.☐ *If not recorded tick here* ☐

For LCM use only

B6. IMD score: ☐☐.☐☐

B7. Tick this box if this form was not started around the time of birth and was filled in retrospectively by the LCM: ☐

Section C: Pregnancy history

Previous pregnancies

C1. Number of pregnancies of ≥ 24 weeks, prior to this pregnancy: *If none, write 0* ☐☐

This pregnancy

C2. Expected date of delivery: ☐☐/☐☐/☐☐

C3. Immediately prior to the onset of labour, was this woman known to have any of the medical conditions or obstetric history items listed opposite?

☐ No

☐ Yes *Please write in code(s) below from tables opposite*

Example: For a woman with previous pre-eclampsia requiring preterm birth, the condition is found in the 'Obstetric history' table under 'Previous complications' and coded '12 C'. For a woman with a condition that is not listed in the tables opposite, please enter the code for 'Other' and write in the condition in the space provided.

12	C	

Code		If Other, please write name of condition clearly

C4. At the start of care in labour, did this woman have any of the following conditions? *Please tick all that apply*

☐ Prolonged rupture of membranes greater than 18 hours

☐ If membranes are ruptured, any meconium stained liquor

☐ Proteinuria of 1+ or more

☐ Hypertension with either:
- diastolic blood pressure of ≥ 90mm Hg on more than one occasion 20 minutes apart or ≥ 100mm Hg on one occasion
- systolic blood pressure ≥ 160mm Hg on at least one occasion

☐ Abnormal vaginal bleeding

☐ Non-cephalic presentation

☐ Abnormal fetal heart rate

☐ Other complications *Please specify* _____

☐ **None of the above**

Medical conditions

Type of condition	Code	Additional information
Cardiovascular	01	A: Confirmed cardiac disease B: Hypertensive disorders
Respiratory	02	A: Asthma requiring an increase in treatment or hospital treatment B: Cystic fibrosis
Haematological	03	A: Haemoglobinopathies – sickle-cell disease, beta-thalassaemia major B: History of thromboembolic disorders C: Immune thrombocytopenia purpura or other platelet disorder or platelet count below 100 000/cubic mm D: Von Willebrand's disease E: Bleeding disorder in the woman or unborn baby F: Atypical antibodies which carry a risk of haemolytic disease of the newborn
Infective	04	A: Risk factors associated with group B streptococcus whereby antibiotics in labour would be recommended B: Hepatitis B/C with abnormal liver function tests C: Infected with HIV D: Toxoplasmosis – woman receiving treatment E: Current active infection of chicken pox/rubella/genital herpes in the woman or baby F: Tuberculosis under treatment
Immune	05	A: Systemic lupus erythematosus B: Scleroderma
Endocrine	06	A: Hyperthyroidism B: Diabetes
Renal	07	A: Abnormal renal function B: Renal disease requiring supervision by a renal specialist
Neurological	08	A: Epilepsy B: Myasthenia gravis C: Previous cerebrovascular accident
Gastrointestinal	09	A: Liver disease associated with current abnormal liver function tests
Psychiatric	10	A: Psychiatric disorder requiring current inpatient care
Other	11	A: Please write in condition or diagnosis

Obstetric history

Type of condition	Code	Additional information
Previous complications	12	A: Unexplained stillbirth/neonatal death or previous death related to intrapartum difficulty B: Previous baby with neonatal encephalopathy C: Pre-eclampsia requiring preterm birth D: Placental abruption with adverse outcome E: Eclampsia F: Uterine rupture G: Primary postpartum haemorrhage requiring additional treatment or blood transfusion H: Retained placenta requiring manual removal in theatre I: Caesarean section J: Shoulder dystocia
Current pregnancy	13	A: Multiple birth B: Placenta praevia C: Pre-eclampsia or pregnancy-induced hypertension D: Preterm labour or preterm prelabour rupture of membranes E: Placental abruption F: Anaemia – haemoglobin less than 8.5 g/dl at onset of labour G: Confirmed intrauterine death H: Induction of labour I: Substance misuse J: Alcohol dependency requiring assessment or treatment K: Onset of gestational diabetes L: Malpresentation – breech or transverse lie M: Body mass index at booking of greater than 35 kg/m^2 N: Recurrent antepartum haemorrhage
Fetal indications	14	A: Small for gestational age in this pregnancy (less than fifth centile or reduced growth velocity on ultrasound) B: Abnormal fetal heart rate (FHR)/Doppler studies C: Ultrasound diagnosis of oligo-/polyhydramnios
Previous gynaecological history	15	A: Myomectomy B: Hysterotomy
Other	16	A: Please write in condition or diagnosis

Section D: Labour and birth

If multiple pregnancy, please complete for the first baby only

D1. **Did this woman make her final decision about place of birth during labour?** ☐ Yes ☐ No

D2. **Date and time midwife started labour care:** D D / M M / Y Y h h : m m (24hr)

D3. **Cervical dilatation at start of labour care:** ☐☐ *(0-10cm)* ☐ Not assessed

D4. **Was this woman transferred to a midwifery unit or an obstetric unit at any time during labour care or immediately after the birth?** ☐ Yes ☐ No

If No, please go to question D5

Maternal Transfer

If woman transferred more than once, please tick this box ☐ *and complete the questions below for care received during the first transfer only*

T1. **Date and time of decision to transfer:** D D / M M / Y Y h h : m m (24hr)

T2. **Primary reason for transfer:** *Please write in one code from list* ☐☐

01 Failure to progress (1st stage)
02 Fetal distress (1st stage)
03 Meconium staining
04 Epidural request
05 Hypertension
06 Malposition
07 Malpresentation
08 Antepartum haemorrhage
09 Failure to progress (2nd stage)
10 Fetal distress (2nd stage)
11 Postpartum haemorrhage
12 Retained placenta
13 Repair of perineal trauma
14 Other *Please specify* _____

T3. **Date and time of start of transfer:** D D / M M / Y Y h h : m m (24hr)

T4. **Mode of transfer:** ☐1 Private car ☐2 Ambulance ☐3 Other

If Other, please specify _____

T5. **Full name of unit woman transferred to:** _____

T6. **Date and time of start of midwifery care in transfer unit:** D D / M M / Y Y h h : m m (24hr)

T7. **Date and time of first clinical assessment by obstetrician:** D D / M M / Y Y h h : m m (24hr)

Tick if not assessed by an obstetrician ☐

T8. **Was labour augmented with syntocinon?** ☐ Yes ☐ No

T9. **Did this woman have an epidural or spinal?** ☐ Yes ☐ No

T10. **Did this woman have a general anaesthetic?** ☐ Yes ☐ No

D5. **Date and time of delivery:** D D / M M / Y Y h h : m m (24hr)

D6. **Place of birth:** ☐1 Home ☐2 Obstetric unit ☐3 Other

If Other, please specify _____

D7. **Mode of birth:** *Please tick one box only*
If caesarean section after failed forceps/ventouse, tick caesarean section

☐1 Spontaneous vertex birth ☐2 Vaginal breech
☐3 Ventouse ☐4 Forceps ☐5 Caesarean section

Primary reason for instrumental or caesarean delivery _____

D8. **At any time during labour did this woman use immersion in water for pain relief?** ☐ Yes ☐ No

D9. **Did this woman have active management of the 3rd stage?** ☐ Yes ☐ No

D10. **Did this woman have an episiotomy?** ☐ Yes ☐ No

D11. **Was there any perineal trauma involving the anal sphincter?** *(3rd/4th degree tear)* ☐ Yes ☐ No

D12. **Birth outcome:** ☐1 Live birth ☐2 Stillbirth

D13. **Sex of baby:** ☐1 Male ☐2 Female ☐3 Unknown

D14. **Birthweight:** ☐☐☐☐ g

D15. **Apgar at 5 minutes:** ☐☐

D16. **When was the episode of labour care completed?** ☐☐/☐☐/☐☐ ☐☐:☐☐ (24hr)
See back cover for guidance

Please place this form in the woman's postnatal notes.

Section E: After birth

*To be completed by the **midwife** on or after the 5th postnatal day and before transfer to the health visitor*

E1. **Within the first 48 hours after birth was this woman admitted to:** *Please tick all that apply*
Do not include recovery ward for operative delivery

☐ High Dependency Area ☐ ICU ☐ Specialist unit *e.g. dialysis unit*

Primary reason for admission _____

If Specialist unit, please specify _____

E2. **Did this woman receive a blood transfusion within 48 hours of birth?** ☐ Yes ☐ No

E3. **Date and time woman discharged home:** ☐☐/☐☐/☐☐ ☐☐:☐☐ (24hr)

Not yet discharged ☐

Not applicable, delivered at home ☐

E4. **Did this woman breastfeed her baby at least once?** ☐ Yes ☐ No

E5. **Was the baby admitted to a neonatal unit within 48 hours of birth?** ☐ Yes ☐ No

If Yes, to where was the baby admitted? *Please tick one box only*

☐1 Special Care Baby Unit ☐2 High Dependency Unit ☐3 Neonatal Intensive Care

Date baby was discharged from neonatal unit: ☐☐/☐☐/☐☐

Not yet discharged ☐

E6. **Were any of the following identified in the baby within 48 hours after birth?** *Please tick all that apply*

☐ Meconium aspiration syndrome
☐ Neonatal encephalopathy
☐ Brachial plexus injury
☐ Fractured humerus
☐ Fractured clavicle
☐ Fractured skull
☐ Neonatal sepsis
☐ **No morbidity identified**
☐ Cephalohaematoma
☐ Cerebral haemorrhage
☐ Kernicterus
☐ Seizures
☐ Admission to neonatal unit within 48 hrs of birth for at least 48 hrs with evidence of feeding difficulties or respiratory distress
☐ Other morbidity
Please specify _____

E7. **Was the baby known to have died at the time this form was completed?** ☐ Yes ☐ No

E8. **Section E completed by:** *Please print full name* _____

☐☐/☐☐/☐☐ ☐☐:☐☐ (24hr)

Please fill in the After birth section on page 1

6

Barcode/Number

Thank you for completing this form.

Please return this form to the Local Co-ordinating Midwife in the envelope provided using the internal post.

Guidance

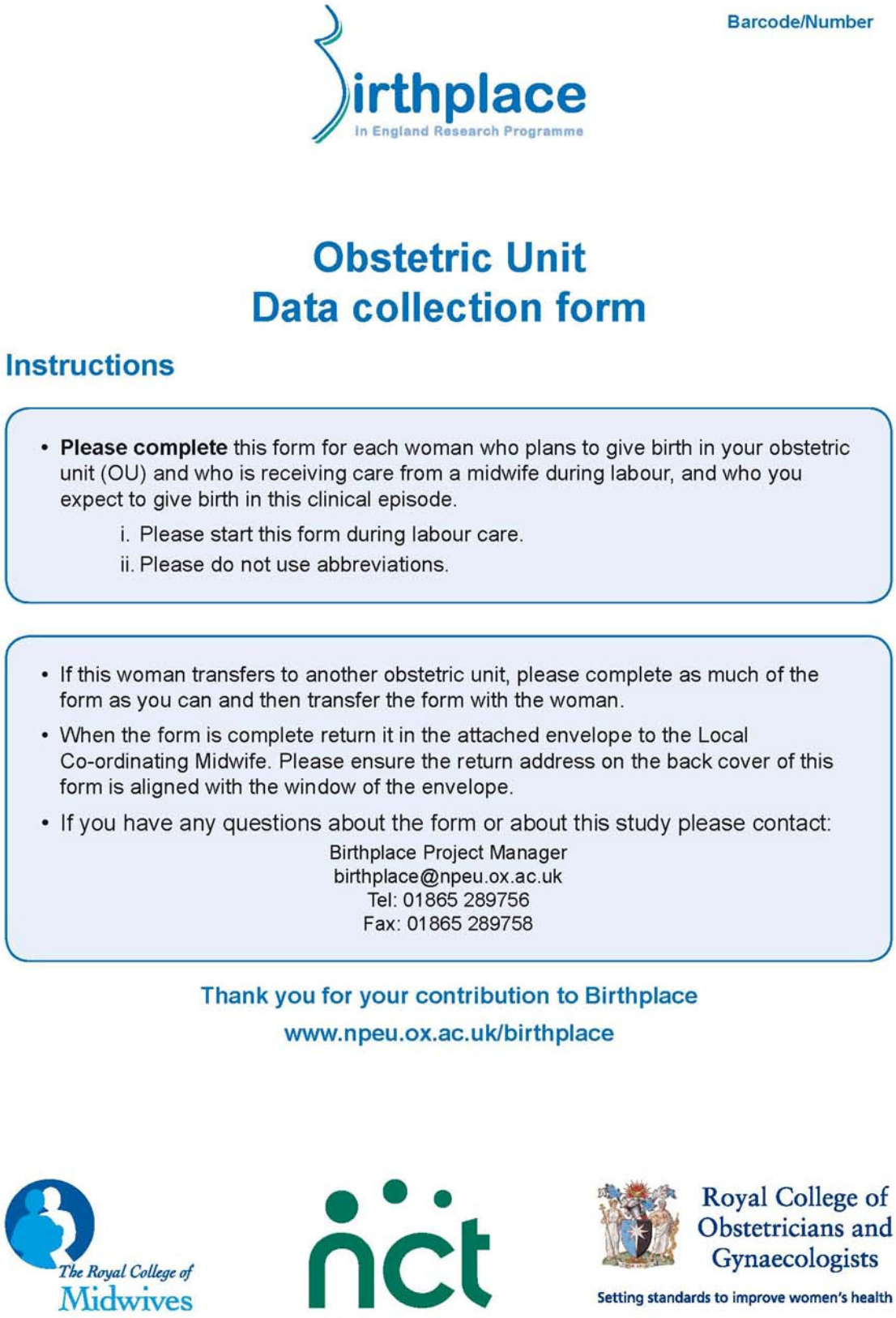
D16.

For women who give birth at home, the episode of labour care is completed when the midwife leaves the woman's home.

For women who give birth in a freestanding midwifery unit, an alongside midwifery unit, or in hospital, the episode of labour care is completed when the woman is discharged from the delivery room or when the midwife begins the postnatal notes, whichever occurs first.

MREC reference number: 07/H0505/151
Version1
14 February 2008

Figure 4.2: Planned obstetric unit data collection form



Barcode/Number

Birthplace
In England Research Programme

Obstetric Unit
Data collection form

Instructions

- **Please complete** this form for each woman who plans to give birth in your obstetric unit (OU) and who is receiving care from a midwife during labour, and who you expect to give birth in this clinical episode.
  - i. Please start this form during labour care.
  - ii. Please do not use abbreviations.

- If this woman transfers to another obstetric unit, please complete as much of the form as you can and then transfer the form with the woman.
- When the form is complete return it in the attached envelope to the Local Co-ordinating Midwife. Please ensure the return address on the back cover of this form is aligned with the window of the envelope.
- If you have any questions about the form or about this study please contact:

Birthplace Project Manager
birthplace@npeu.ox.ac.uk
Tel: 01865 289756
Fax: 01865 289758

Thank you for your contribution to Birthplace
www.npeu.ox.ac.uk/birthplace

The Royal College of Midwives

nct

Royal College of Obstetricians and Gynaecologists
Setting standards to improve women's health

Section A: Birthplace obstetric unit eligibility criteria

A1. **Is this woman having a caesarean section before the onset of labour?** ☐ Yes ☐ No

A2. **Is this a multiple pregnancy?** ☐ Yes ☐ No

A3. **Is the gestation of this pregnancy 36^{+6} weeks or less?** ☐ Yes ☐ No

A4. **Is this woman "unbooked"?** *i.e. has had no antenatal care* ☐ Yes ☐ No

If you answered 'Yes' to ANY of these questions:

- Do NOT complete the remainder of this form.
- Place the form in the 'Birthplace box' or appropriate location for it to be returned to the Local Coordinating Midwife (LCM).

If you answered 'No' to ALL of these questions:

- Continue completing this form.
- Once you have completed Section D, at the end of the episode of labour, place the form in the woman's postnatal notes so that section E can be completed on or after the 5th postnatal day.

Woman's identifying details

This page will be detached from the rest of the form and kept in a secure location in your Trust by the Local Co-ordinating Midwife (LCM).

Please stick woman's address label here:

OR complete the following details:

A5. **Woman's full name:** *Please print* _____

A6. **Woman's date of birth:** ☐☐/☐☐/☐☐

A7. **Woman's NHS number:** ☐☐☐☐☐☐☐☐☐☐

A8. **Woman's home address:** *Please print*

_____

_____

_____

A9. **Woman's full postcode:** ☐☐☐☐ ☐☐☐

A10. **Section A completed by:** *Please print full name* _____

Office use only

After birth

Please fill in this box once the labour episode is complete

A11. **Date of delivery:** ☐☐/☐☐/☐☐

A12. **Baby's NHS number:** *(If known)* ☐☐☐☐☐☐☐☐☐☐

1

Birthplace Obstetric Unit

In England Research Programme

Section B: Woman's details

B1. Woman's age at delivery: *(Years)* ☐☐

B2. Woman's ethnic group: *(As recorded in her maternity notes)*

☐☐ *Please write in one code from the list below*

01 White British	09 Pakistani
02 White Irish	10 Bangladeshi
03 Any other White background	11 Any other Asian background
04 Mixed White & Black Caribbean	12 Black Caribbean
05 Mixed White & Black African	13 Black African
06 Mixed White & Asian	14 Any other Black background
07 Any other Mixed background	15 Chinese
08 Indian	16 Any other ethnic group

B3. Woman's understanding of English language:

☐1 Fluent

☐2 Some understanding/Able to communicate verbally

☐3 No understanding/Not able to communicate verbally

B4. Woman's marital/partner status:

☐1 Married/Living with a partner

☐2 Single/Unsupported by partner *(this includes single woman living with family)*

B5. Woman's BMI in pregnancy: ☐☐.☐ *If not recorded tick here* ☐

For LCM use only

B6. IMD score: *(www.npeu.ox.ac.uk/birthplace/lcm/imd)* ☐☐.☐☐

B7. Tick this box if this form was not started around the time of birth and was filled in retrospectively by the LCM: ☐

Section C: Pregnancy history

Previous pregnancies

C1. Number of pregnancies of ≥ 24 weeks, prior to this pregnancy: *If none, write 0* ☐☐

This pregnancy

C2. Expected date of delivery: ☐☐/☐☐/☐☐

C3. Immediately prior to the onset of labour, was this woman known to have any of the complications listed opposite?

☐ No

☐ Yes *Please write in code(s) below from tables opposite*

Example: For a woman with previous pre-eclampsia requiring preterm birth, the condition is found in the 'Obstetric history' table under 'Previous complications' and coded '12 C'. For a woman with a condition that is not listed in the tables opposite, please enter the code for 'Other' and write in the condition in the space provided.

12	C	

Code		If Other, please write name of condition clearly

C4. At the start of care in labour, did this woman have any of the following conditions? *Please tick all that apply*

☐ Prolonged rupture of membranes greater than 18 hours

☐ If membranes are ruptured, any meconium stained liquor

☐ Proteinuria of 1+ or more

☐ Hypertension with either:
- diastolic blood pressure of ≥ 90mm Hg on more than one occasion 20 minutes apart or ≥ 100mm Hg on one occasion
- systolic blood pressure ≥ 160mm Hg on at least one occasion

☐ Abnormal vaginal bleeding

☐ Non-cephalic presentation

☐ Abnormal fetal heart rate

☐ Other complications *Please specify* _____

☐ **None of the above**

Medical conditions

Type of condition	Code	Additional information
Cardiovascular	01	A: Confirmed cardiac disease B: Hypertensive disorders
Respiratory	02	A: Asthma requiring an increase in treatment or hospital treatment B: Cystic fibrosis
Haematological	03	A: Haemoglobinopathies – sickle-cell disease, beta-thalassaemia major B: History of thromboembolic disorders C: Immune thrombocytopenia purpura or other platelet disorder or platelet count below 100 000/cubic mm D: Von Willebrand's disease E: Bleeding disorder in the woman or unborn baby F: Atypical antibodies which carry a risk of haemolytic disease of the newborn
Infective	04	A: Risk factors associated with group B streptococcus whereby antibiotics in labour would be recommended B: Hepatitis B/C with abnormal liver function tests C: Infected with HIV D: Toxoplasmosis – woman receiving treatment E: Current active infection of chicken pox/rubella/genital herpes in the woman or baby F: Tuberculosis under treatment
Immune	05	A: Systemic lupus erythematosus B: Scleroderma
Endocrine	06	A: Hyperthyroidism B: Diabetes
Renal	07	A: Abnormal renal function B: Renal disease requiring supervision by a renal specialist
Neurological	08	A: Epilepsy B: Myasthenia gravis C: Previous cerebrovascular accident
Gastrointestinal	09	A: Liver disease associated with current abnormal liver function tests
Psychiatric	10	A: Psychiatric disorder requiring current inpatient care
Other	11	A: Please write in condition or diagnosis

Obstetric history

Type of condition	Code	Additional information
Previous complications	12	A: Unexplained stillbirth/neonatal death or previous death related to intrapartum difficulty B: Previous baby with neonatal encephalopathy C: Pre-eclampsia requiring preterm birth D: Placental abruption with adverse outcome E: Eclampsia F: Uterine rupture G: Primary postpartum haemorrhage requiring additional treatment or blood transfusion H: Retained placenta requiring manual removal in theatre I: Caesarean section J: Shoulder dystocia
Current pregnancy	13	A: Multiple birth B: Placenta praevia C: Pre-eclampsia or pregnancy-induced hypertension D: Preterm labour or preterm prelabour rupture of membranes E: Placental abruption F: Anaemia – haemoglobin less than 8.5 g/dl at onset of labour G: Confirmed intrauterine death H: Induction of labour I: Substance misuse J: Alcohol dependency requiring assessment or treatment K: Onset of gestational diabetes L: Malpresentation – breech or transverse lie M: Body mass index at booking of greater than 35 kg/m^2 N: Recurrent antepartum haemorrhage
Fetal indications	14	A: Small for gestational age in this pregnancy (less than fifth centile or reduced growth velocity on ultrasound) B: Abnormal fetal heart rate (FHR)/Doppler studies C: Ultrasound diagnosis of oligo-/polyhydramnios
Previous gynaecological history	15	A: Myomectomy B: Hysterotomy
Other	16	A: Please write in condition or diagnosis

Section D: Labour and birth

D1. **Date and time midwife started labour care:** D D / M M / Y Y H H : M M (24hr)

D2. **Cervical dilatation at start of labour care:** ☐☐ *(0-10cm)* ☐ Not assessed

D3. **Was this woman transferred to another obstetric unit at any time during labour care or immediately after birth?** ☐ Yes ☐ No

D4. **Was labour augmented with syntocinon?** ☐ Yes ☐ No

D5. **At any time during labour did this woman use immersion in water for pain relief?** ☐ Yes ☐ No

D6. **Did this woman have an epidural or spinal?** ☐ Yes ☐ No

D7. **Did this woman have a general anaesthetic?** ☐ Yes ☐ No

D8. **Date and time of delivery:** D D / M M / Y Y H H : M M (24hr)

D9. **Place of birth:** ☐1 Obstetric unit ☐2 Other

If Other, please specify _____

D10. **Mode of birth:** *Please tick one box only*
If caesarean section after failed forceps/ventouse, tick caesarean section

☐1 Spontaneous vertex birth ☐2 Vaginal breech
☐3 Ventouse ☐4 Forceps ☐5 Caesarean section

Primary reason for instrumental or caesarean delivery _____

D11. **Did this woman have active management of the 3rd stage?** ☐ Yes ☐ No

D12. **Did this woman have an episiotomy?** ☐ Yes ☐ No

D13. **Was there any perineal trauma involving the anal sphincter?** *(3rd/4th degree tear)* ☐ Yes ☐ No

D14. **Birth outcome:** ☐1 Live birth ☐2 Stillbirth

D15. **Sex of baby:** ☐1 Male ☐2 Female ☐3 Unknown

D16. **Birthweight:** ☐☐☐☐ g

D17. **Apgar at 5 minutes:** ☐☐

D18. **When was the episode of labour care completed?** D D / M M / Y Y H H : M M (24hr)
See back cover for guidance

Please place this form in the woman's postnatal notes.

Section E: After birth

*To be completed by the **midwife** on or after the 5th postnatal day and before transfer to the health visitor*

E1. Within the first 48 hours after birth was this woman admitted to: *Please tick all that apply*
Do not include recovery ward for operative delivery

☐ High Dependency Area ☐ ICU ☐ Specialist unit *e.g. dialysis unit*

Primary reason for admission _____

If Specialist unit, please specify unit type _____

E2. Did this woman receive a blood transfusion within 48 hours of birth? ☐ Yes ☐ No

E3. Date and time woman discharged home: D D / M M / Y Y Y Y H H : M M (24hr)

Not yet discharged ☐

E4. Did this woman breastfeed her baby at least once? ☐ Yes ☐ No

E5. Was the baby admitted to a neonatal unit within 48 hours of birth? ☐ Yes ☐ No

If Yes, to where was the baby admitted? *Please tick one box only*

☐ 1 Special Care Baby Unit ☐ 2 High Dependency Unit ☐ 3 Neonatal Intensive Care

Date baby was discharged from neonatal unit: D D / M M / Y Y

Not yet discharged ☐

E6. Were any of the following identified in the baby within 48 hours after birth? *Please tick all that apply*

☐ Meconium aspiration syndrome
☐ Neonatal encephalopathy
☐ Brachial plexus injury
☐ Fractured humerus
☐ Fractured clavicle
☐ Fractured skull
☐ Neonatal sepsis
☐ Cephalohaematoma
☐ Cerebral haemorrhage
☐ Kernicterus
☐ Seizures
☐ Admission to neonatal unit within 48 hrs of birth for at least 48 hrs with evidence of feeding difficulties or respiratory distress

☐ **No morbidity identified**

☐ Other morbidity
Please specify _____

E7. Was the baby known to have died at the time this form was completed? ☐ Yes ☐ No

E8. Section E completed by: *Please print full name* _____

E9. Date and time Section E completed: D D / M M / Y Y Y Y H H : M M (24hr)

Please fill in the After birth section on page 1

Barcode/Number

Thank you for completing this form.

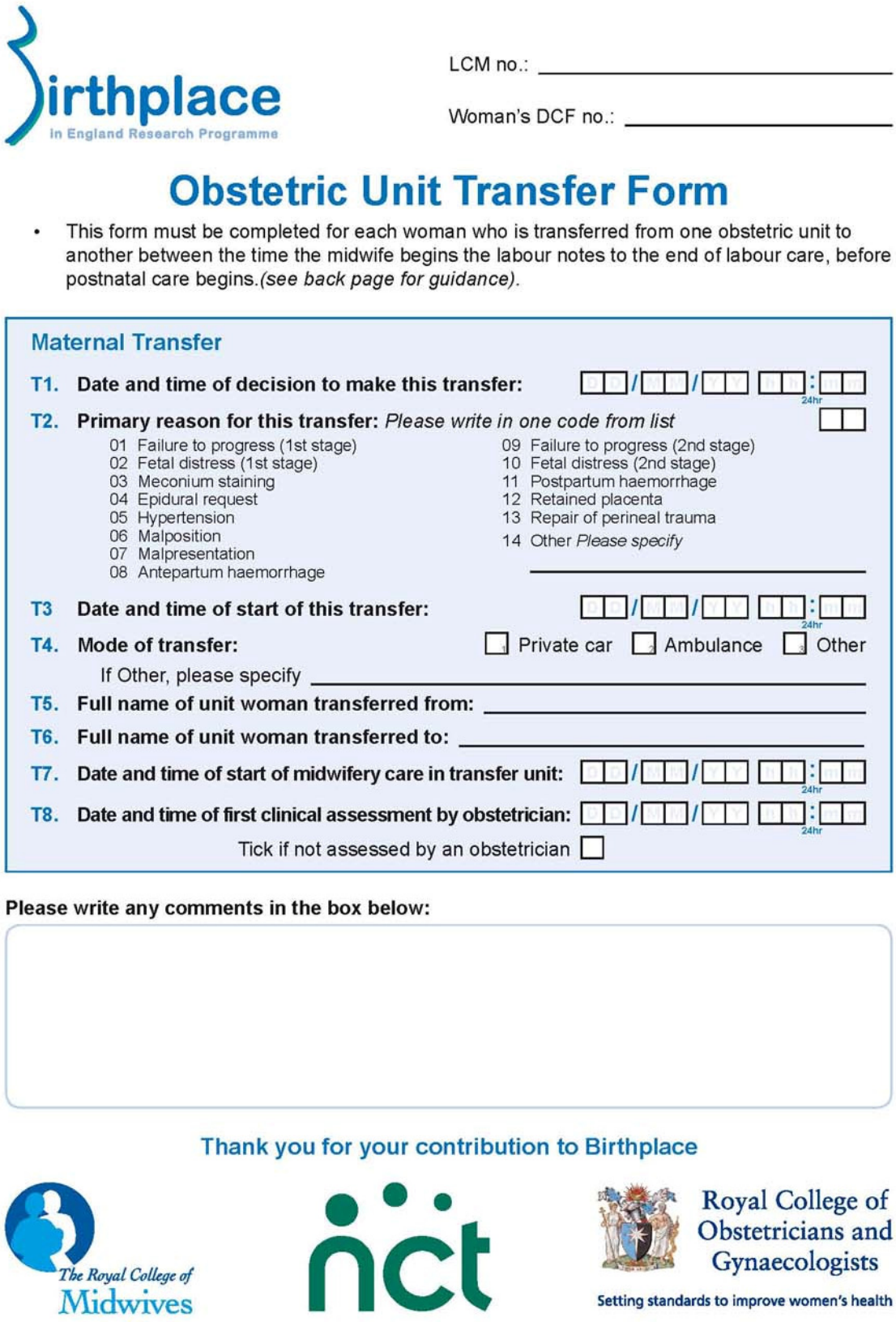
Please return this form to the Local Co-ordinating Midwife in the envelope provided using the internal post.

Guidance

D18.

The episode of labour care is completed when the woman is discharged from the delivery room or when the midwife begins the postnatal notes, whichever occurs first.

Figure 3.3: Obstetric unit transfer form



Birthplace in England Research Programme

LCM no.: _____

Woman's DCF no.: _____

Obstetric Unit Transfer Form

- This form must be completed for each woman who is transferred from one obstetric unit to another between the time the midwife begins the labour notes to the end of labour care, before postnatal care begins.*(see back page for guidance)*.

Maternal Transfer

T1. **Date and time of decision to make this transfer:** ☐☐/☐☐/☐☐☐☐ ☐☐:☐☐ 24hr

T2. **Primary reason for this transfer:** *Please write in one code from list* ☐☐

01 Failure to progress (1st stage)	09 Failure to progress (2nd stage)
02 Fetal distress (1st stage)	10 Fetal distress (2nd stage)
03 Meconium staining	11 Postpartum haemorrhage
04 Epidural request	12 Retained placenta
05 Hypertension	13 Repair of perineal trauma
06 Malposition	14 Other *Please specify*
07 Malpresentation	
08 Antepartum haemorrhage	

T3 **Date and time of start of this transfer:** ☐☐/☐☐/☐☐☐☐ ☐☐:☐☐ 24hr

T4. **Mode of transfer:** ☐ Private car ☐ Ambulance ☐ Other

If Other, please specify _____

T5. **Full name of unit woman transferred from:** _____

T6. **Full name of unit woman transferred to:** _____

T7. **Date and time of start of midwifery care in transfer unit:** ☐☐/☐☐/☐☐☐☐ ☐☐:☐☐ 24hr

T8. **Date and time of first clinical assessment by obstetrician:** ☐☐/☐☐/☐☐☐☐ ☐☐:☐☐ 24hr

Tick if not assessed by an obstetrician ☐

Please write any comments in the box below:

Thank you for your contribution to Birthplace

The Royal College of Midwives

nct

Royal College of Obstetricians and Gynaecologists

Setting standards to improve women's health

Thank you for completing this form.

Please return this form to the Birthplace co-ordinating office.

FREEPOST RRKH-XXAB-JJLK
Birthplace in England Research Programme
NPEU
University of Oxford
Old Road Campus
Headington
Oxford, OX3 7LF

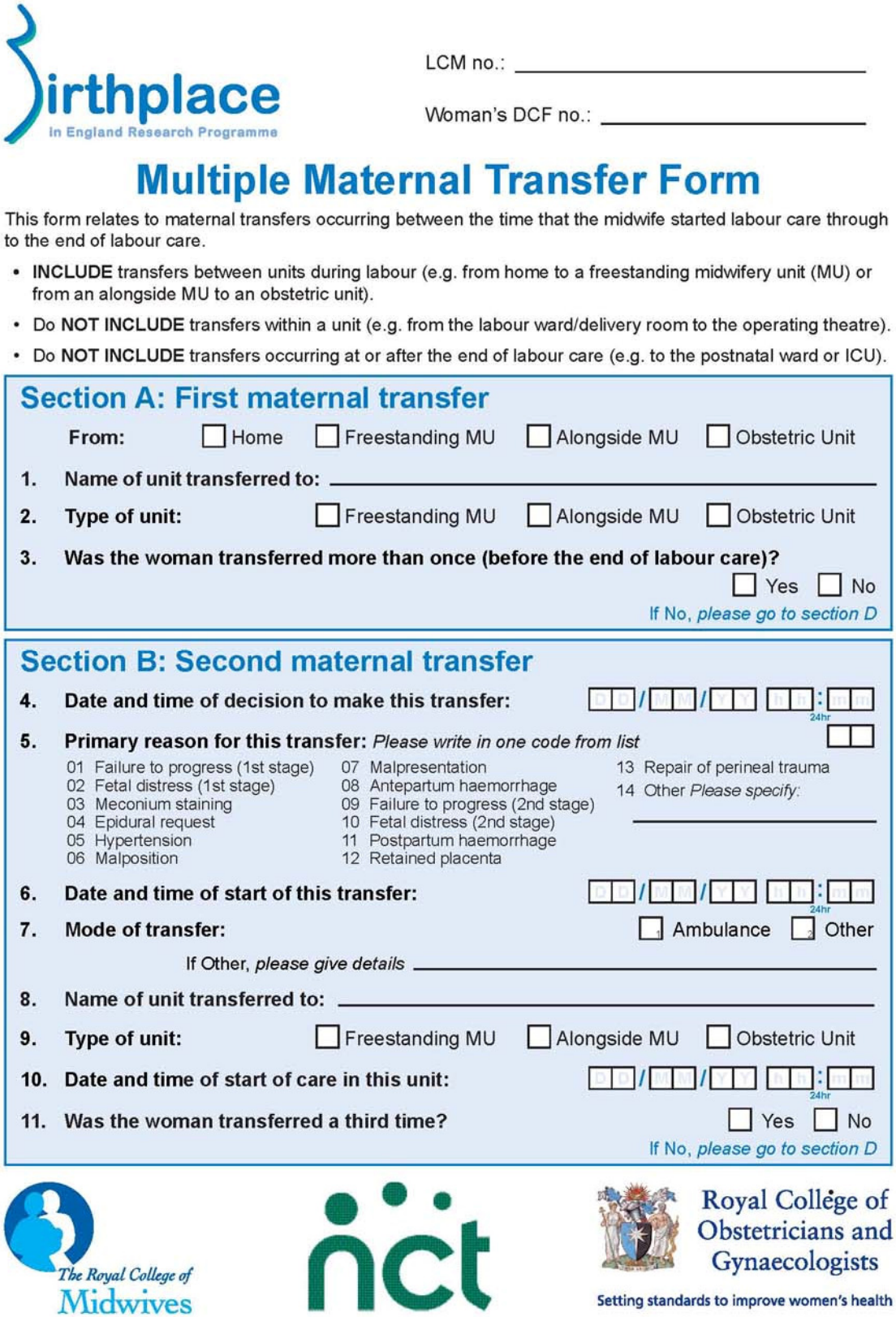
Guidance

Definition of End of Labour Care

The episode of labour care is completed when the woman is discharged from the delivery room or when the midwife begins the postnatal notes, whichever occurs first.

MREC reference number: 07/H0505/151
Version 1
October 2008

Figure 3.4: Multiple maternal transfer form



Birthplace in England Research Programme

LCM no.: _____

Woman's DCF no.: _____

Multiple Maternal Transfer Form

This form relates to maternal transfers occurring between the time that the midwife started labour care through to the end of labour care.

- **INCLUDE** transfers between units during labour (e.g. from home to a freestanding midwifery unit (MU) or from an alongside MU to an obstetric unit).
- Do **NOT INCLUDE** transfers within a unit (e.g. from the labour ward/delivery room to the operating theatre).
- Do **NOT INCLUDE** transfers occurring at or after the end of labour care (e.g. to the postnatal ward or ICU).

Section A: First maternal transfer

From: ☐ Home ☐ Freestanding MU ☐ Alongside MU ☐ Obstetric Unit

1. **Name of unit transferred to:** _____
2. **Type of unit:** ☐ Freestanding MU ☐ Alongside MU ☐ Obstetric Unit
3. **Was the woman transferred more than once (before the end of labour care)?** ☐ Yes ☐ No

If No, *please go to section D*

Section B: Second maternal transfer

4. **Date and time of decision to make this transfer:** D D / M M / Y Y H H : m m (24hr)
5. **Primary reason for this transfer:** *Please write in one code from list* ☐☐

01 Failure to progress (1st stage)	07 Malpresentation	13 Repair of perineal trauma
02 Fetal distress (1st stage)	08 Antepartum haemorrhage	14 Other *Please specify:*
03 Meconium staining	09 Failure to progress (2nd stage)	_____
04 Epidural request	10 Fetal distress (2nd stage)	
05 Hypertension	11 Postpartum haemorrhage	
06 Malposition	12 Retained placenta	

6. **Date and time of start of this transfer:** D D / M M / Y Y H H : m m (24hr)
7. **Mode of transfer:** ☐1 Ambulance ☐2 Other

If Other, *please give details* _____

8. **Name of unit transferred to:** _____
9. **Type of unit:** ☐ Freestanding MU ☐ Alongside MU ☐ Obstetric Unit
10. **Date and time of start of care in this unit:** D D / M M / Y Y H H : m m (24hr)
11. **Was the woman transferred a third time?** ☐ Yes ☐ No

If No, *please go to section D*

The Royal College of Midwives

nct

Royal College of Obstetricians and Gynaecologists

Setting standards to improve women's health

Section C: Third maternal transfer

12. Date and time of decision to make this transfer: D D / M M / Y Y h h : m m (24hr)

13. Primary reason for this transfer: *Please write in one code from list* ☐☐

01 Failure to progress (1st stage)
02 Fetal distress (1st stage)
03 Meconium staining
04 Epidural request
05 Hypertension
06 Malposition
07 Malpresentation
08 Antepartum haemorrhage
09 Failure to progress (2nd stage)
10 Fetal distress (2nd stage)
11 Postpartum haemorrhage
12 Retained placenta
13 Repair of perineal trauma
14 Other *Please specify*: _____

14. Date and time of start of this transfer: D D / M M / Y Y h h : m m (24hr)

15. Mode of transfer: ☐1 Ambulance ☐2 Other

If Other, *please give details* _____

16. Name of unit transferred to: _____

17. Type of unit: ☐ Freestanding MU ☐ Alongside MU ☐ Obstetric Unit

18. Date and time of start of care in this unit: D D / M M / Y Y h h : m m (24hr)

Section D: Intrapartum care

19. Date and time of first clinical assessment by an obstetrician:

D D / M M / Y Y h h : m m (24hr)

Tick if not assessed by an obstetrician: ☐

20. Was labour augmented with syntocinon? ☐ Yes ☐ No

21. Did the woman have an epidural or spinal? ☐ Yes ☐ No

22. Did the woman have a general anaesthetic? ☐ Yes ☐ No

Section E: Other details

23. Please record any other information that you think may be relevant

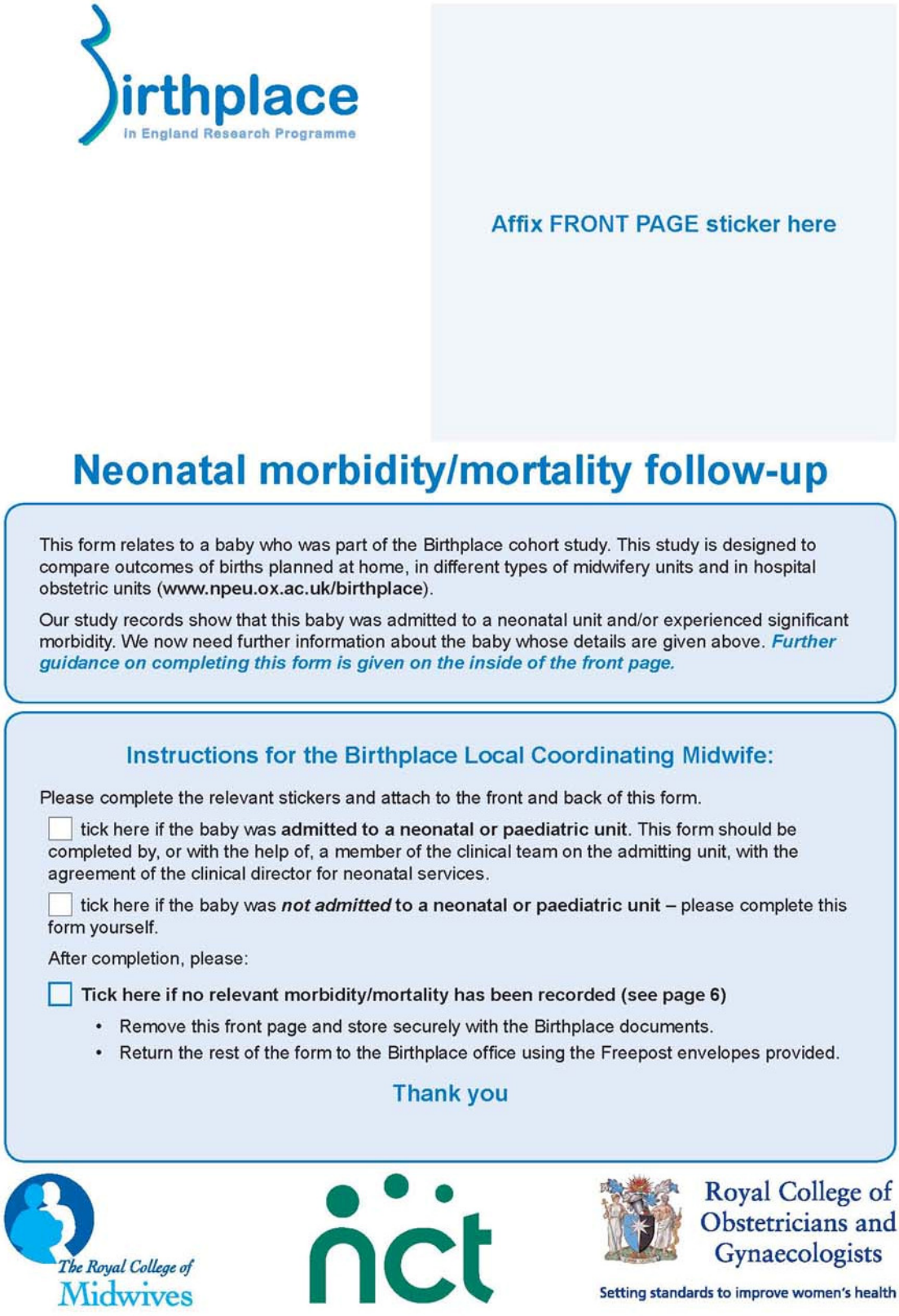
Completed by: _____

Thank you for completing this form.
Please return this form to the Birthplace Co-ordinating Office.

FREEPOST RRKH-XXAB-JJLK
Birthplace in England Research Programme
NPEU, University of Oxford
Old Road Campus
Oxford, OX3 7LF

MREC reference number: 07/H0505/151
Version 2, March 2010

Figure 3.5: Neonatal morbidity form



Birthplace
in England Research Programme

Affix FRONT PAGE sticker here

Neonatal morbidity/mortality follow-up

This form relates to a baby who was part of the Birthplace cohort study. This study is designed to compare outcomes of births planned at home, in different types of midwifery units and in hospital obstetric units (**www.npeu.ox.ac.uk/birthplace**).

Our study records show that this baby was admitted to a neonatal unit and/or experienced significant morbidity. We now need further information about the baby whose details are given above. ***Further guidance on completing this form is given on the inside of the front page.***

Instructions for the Birthplace Local Coordinating Midwife:

Please complete the relevant stickers and attach to the front and back of this form.

☐ tick here if the baby was **admitted to a neonatal or paediatric unit**. This form should be completed by, or with the help of, a member of the clinical team on the admitting unit, with the agreement of the clinical director for neonatal services.

☐ tick here if the baby was ***not admitted*** **to a neonatal or paediatric unit** – please complete this form yourself.

After completion, please:

☐ **Tick here if no relevant morbidity/mortality has been recorded (see page 6)**

- Remove this front page and store securely with the Birthplace documents.
- Return the rest of the form to the Birthplace office using the Freepost envelopes provided.

Thank you

The Royal College of Midwives

nct

Royal College of Obstetricians and Gynaecologists

Setting standards to improve women's health

Instructions to the person completing this form

Please complete this form and return to the Birthplace Local Coordinating midwife (LCM). See back page for return address.

Please enter your name and contact details here in case the LCM has any queries.

Name: _____ Phone/email: _____

The LCM will check the completed form and remove the front page and all identifying details before returning to the Birthplace office. The front page will be kept in a secure location by the LCM in the Trust where this baby was born.

Thank you for your help.

If you have any questions about the form or about this study please contact:

- the Birthplace Local Coordinating midwife (LCM) whose address is given on the back page of this form; or
- the Birthplace Project Manager

  Tel: 01865 289748
  Fax: 01865 289758
  Email: birthplace@npeu.ox.ac.uk

MREC reference number: 07/H0505/151

Definitions: Levels of neonatal care

Intensive care: for babies with the most complex problems, receiving any respiratory support via a tracheal tube and in the first 24 hours after its withdrawal; receiving NCPAP for any part of the day and less than five days old; below 1000g current weight and receiving NCPAP for any part of the day and for 24 hours after withdrawal; less than 29 weeks gestational age and less than 48 hours old; requiring major emergency surgery, for the pre-operative period and post-operatively for 24 hours; requiring full exchange transfusion, peritoneal dialysis, infusion of an inotrope, pulmonary vasodilator or prostaglandin and for 24 hours afterwards; any other very unstable baby considered by the nurse-in-charge to need 1:1 nursing; a baby on the day of death.

High dependency care: babies receiving NCPAP for any part of the day and not fulfilling any of the criteria for intensive care; below 1000g current weight and not fulfilling any of the criteria for intensive care; receiving parenteral nutrition; having convulsions; receiving oxygen therapy and below 1500g current weight; requiring treatment for neonatal abstinence syndrome; requiring specified procedures that do not fulfil any criteria for intensive care: care of an intra-arterial catheter or chest drain, partial exchange transfusion, tracheostomy care until supervised by a parent; requiring frequent stimulation for severe apnoea.

Special care: provided for all other babies who could not reasonably be expected to be looked after at home by their mother.

Normal care: provided for babies who themselves have no medical indication to be in hospital.

Section A: Neonatal or paediatric unit admission

1. **Was this baby admitted to a neonatal or paediatric unit for intensive care, high dependency care, special care or transitional care within 48 hours of birth?** Yes ☐ No ☐

   If No, *please go to section B.*

2. **Date of admission:** D D / M M / Y Y

3. **Type of unit**

Neonatal unit	☐
Other	☐

   If Other, please specify unit type: _____

4. **How many days care did the baby receive at each level of care?**
   Include part of any day as 1 day

Intensive care	☐☐☐ days
High dependency care	☐☐☐ days
Special care	☐☐☐ days
Normal care (including on postnatal ward)	☐☐☐ days
Total days:	☐☐☐ days

See definitions of levels of care inside front page of this booklet.

5. **Did this baby have any respiratory support (ventilator or continuous positive airway pressure, CPAP) during their admission?** Yes ☐ No ☐

   If Yes, for how many days? *Include part of any day as 1 day*

Total number of days receiving respiratory support	☐☐☐ days
Total number of days receiving supplemental oxygen	☐☐☐ days

6. **Has the baby been discharged home?** Yes ☐ No ☐

   If Yes, please give date: D D / M M / Y Y

7. **What were the main reasons for admission?**

_____

_____

_____

_____

Section B: Meconium aspiration

1. **Was this baby diagnosed with meconium aspiration syndrome?** Yes ☐ No ☐

   If No, *please go to section C.*

2. **Date of diagnosis:** D D / M M / Y Y

3. **Did this baby receive ECMO during admission?** Yes ☐ No ☐

If Yes, please give total number of days baby received ECMO: ☐☐ days

4. **Were any of the following diagnosed at any time during the baby's stay in the unit, in addition to the diagnosis of meconium aspiration syndrome?** *Please tick all that apply*

Pneumonia	☐
Pulmonary air leak	☐
Pulmonary haemorrhage	☐
Pulmonary hypertension	☐

Section C: Encephalopathy

1. **Was this baby diagnosed with neonatal encephalopathy?** Yes ☐ No ☐

If No, *please go to section D.*

2. **Date of diagnosis:** D D / M M / Y Y

3. **What was the most severe grade of encephalopathy recorded?**

Mild	☐
Moderate	☐
Severe	☐

4. **Was a specific cause of the encephalopathy identified?** Yes ☐ No ☐

If Yes, please give details of any causes identified, in addition to presumed perinatal asphyxia.

_____

_____

5. **Did the baby have seizures requiring treatment?** Yes ☐ No ☐

6. **Was the baby treated with hypothermia (cooling)?** Yes ☐ No ☐

Section D: Seizures

1. **Was this baby diagnosed with isolated seizures?** Yes ☐ No ☐

If No, *please go to section E.*

2. **Date of diagnosis:** D D / M M / Y Y

3. **Was a specific cause of the isolated seizures identified?** Yes ☐ No ☐

If Yes, please give details of any causes identified, in addition to presumed perinatal asphyxia.

_____

_____

4. **Was the baby prescribed medication to control seizures at any time?** Yes ☐ No ☐

Section E: Sepsis

1. **Was this baby diagnosed with neonatal sepsis (proven or suspected)?** Yes ☐ No ☐
   If No, *please go to section F.*

2. **Date of diagnosis:** D D / M M / Y Y

3. **Clinical risk factors for infection:**

   Did the mother have a diagnosis of clinical chorioamnionitis? Yes ☐ No ☐

   What was the duration of membrane rupture prior to delivery? ☐☐☐ days ☐☐☐ hours

   OR ☐ Not Known

   Was the mother known to be a carrier of GBS prior to birth? Yes ☐ No ☐

4. **Up to and including the 5th postnatal day, did the baby have?**

   A positive blood culture Yes ☐ No ☐

   If Yes, please specify organism: _____

   Evidence of infection in CSF Yes ☐ No ☐

   If Yes, please specify white cell count: _____

   Please specify organism: _____

   A positive culture from another site (not blood or CSF)? Yes ☐ No ☐

   If Yes, please specify usually sterile site(s) and organism(s): _____

   Bowel perforation or definite necrotising enterocolitis? Yes ☐ No ☐

   Chest X-ray changes consistent with pneumonia? Yes ☐ No ☐

Section F: Cephalhaematoma

1. **Was this baby diagnosed with cephalhaematoma or subaponeurotic bleeding?**

   Cephalhaematoma Yes ☐ No ☐

   Subaponeurotic bleeding Yes ☐ No ☐

   If No to both, *please go to section G.*

2. **Date of diagnosis:** D D / M M / Y Y

Section G: Cerebral haemorrhage

1. **Was this baby diagnosed with an intracranial haemorrhage?** Yes ☐ No ☐
   If No, *please go to section H.*

2. **Date of diagnosis:** D D / M M / Y Y

3. **What kind of intracranial haemorrhage was this?**

- Subdural haemorrhage ☐
- Subarachnoid haemorrhage ☐
- Intracerebral haemorrhage ☐
- Intraventricular haemorrhage ☐
- Other ☐

If Other, please give details: _____

Section H: Injuries

1. **Was this baby diagnosed with any of the injuries listed below?** Yes ☐ No ☐

If No, *please go to section I.*

Date of diagnosis and cause. *Please tick all that apply.*

Injury	Data of diagnosis	Cause of injury
☐ Brachial plexus injury	D D / M M / Y Y	
☐ Fractured humerus	D D / M M / Y Y	
☐ Fractured clavicle	D D / M M / Y Y	
☐ Fractured skull	D D / M M / Y Y	
☐ Other injury *(give details)* _____	D D / M M / Y Y	

Section I: Kernicterus

1. **Was this baby diagnosed with kernicterus?** Yes ☐ No ☐

If No, *please go to section J.*

2. **Date of diagnosis:** D D / M M / Y Y
3. **What was the maximum SBR recorded for this baby?** ☐☐☐☐ µmol/l
4. **Did the baby require an exchange transfusion?** Yes ☐ No ☐
5. **How many days of phototherapy did the baby receive?**
   Include part of any day as 1 day ☐☐ days

Section J: Feeding difficulties

1. **Was this baby diagnosed with feeding difficulties which required admission to a neonatal or paediatric unit for 48 hours or more?** Yes ☐ No ☐

If No, *please go to section K.*

2. **Date of diagnosis:** D D / M M / Y Y

3. **Did this baby require parenteral feeding?** Yes ☐ No ☐

If Yes, please give the total number of days: ☐☐☐ days

4. **Did this baby require tube (orogastric or nasogastric) feeding?** Yes ☐ No ☐

If Yes, please give the total number of days: ☐☐☐ days

5. **How was the baby being fed at time of discharge (or current method of feeding if not yet discharged)?**

Please tick all that apply.

Intravenously	☐
Naso-gastric	☐
Oro-gastric route	☐
Oral sucking feeding	☐

Section K: Neonatal death

1. **Was the baby known to have died at the time this form was completed?** Yes ☐ No ☐

If No, *please go to section L.*

2. **Date and time of baby's death:** ☐☐/☐☐/☐☐☐☐ ☐☐:☐☐ 24hr

3. **Was this baby registered as a neonatal death?** Yes ☐ No ☐

4. **If this was a neonatal death, where did the baby die?**

Obstetric unit postnatal room	☐
Alongside midwifery unit labour room	☐
Alongside midwifery unit postnatal room	☐
Freestanding midwifery unit labour room	☐
Home	☐
Neonatal unit	☐
Paediatric unit	☐
Other	☐

If Other, please give details: _____

5. **Has a cause of death been identified?** Yes ☐ No ☐

If Yes, please provide details:

_____

_____

_____

6. **Has a postmortem been performed?** Yes ☐ No ☐

Section L: Other details

For all babies: please check all sections and add any additional information that you think might be relevant regarding this baby's condition:

_____

_____

_____

_____

Confirmation of significant neonatal morbidity or mortality

1. **Have at least one of the outcomes listed below been identified for this baby?** Yes ☐ No ☐

- Neonatal or paediatric unit admission (Section A)
- Meconium aspiration (Section B)
- Encephalopathy (Section C)
- Seizures (Section D)
- Sepsis (Section E)
- Cephalhaematoma (Section F)
- Cerebral haemorrhage (Section G)
- Injuries (Section H)
- Kernicterus (Section I)
- Feeding difficulties (Section J)
- Neonatal death (Section K)

If No, were any of the above conditions suspected but not confirmed on investigation? Yes ☐ No ☐

If Yes, please give details

_____

_____

_____

If No, please tick the **blue** box on the front page and give any relevant details below

_____

_____

_____

Job title of person completing this form _____

Date form completed D D M M Y Y

Please return this form to the Birthplace Local Coordinating Midwife (see back cover for the address details)

Affix BACK PAGE sticker here

Return instructions for the person completing this form

Please return this form to the Birthplace Local Coordinating Midwife at the above address. ***Do NOT return to the Birthplace office.***

Thank you very much for completing this form.

If you have any questions, please contact the Birthplace office:

Birthplace Project Manager
Birthplace in England Research Programme
National Perinatal Epidemiology Unit
University of Oxford
Old Road Campus
Oxford
OX3 7LF

Tel: 01865 289748
Fax: 01865 289758
Email: birthplace@npeu.ox.ac.uk

MREC ref: 07/H0505/151
V1 01/2010

Figure 3.6: Maternal morbidity form

Birthplace
in England Research Programme

Affix FRONT PAGE sticker here

Maternal morbidity/mortality follow-up

The Birthplace data collection form for this woman indicates that significant maternal morbidity or mortality may have occurred, or that the baby was stillborn.

Please complete this form to provide additional details about these events.

If you are not sure how to answer any of the questions, please contact the Birthplace office (tel: 01865 289748; email: birthplace@npeu.ox.ac.uk; fax: 01865 289758).

Instructions for completing this form:

Please complete the relevant stickers and attach to the front and back of this form.

After completion, please:

☐ **Tick here if no relevant morbidity/mortality has been recorded (see page 4)**

- Before returning, remove this front page and store securely with the Birthplace documents.
- Return the rest of the form to the Birthplace office using the Freepost envelopes provided.

Thank you

The Royal College of Midwives

nct

Royal College of Obstetricians and Gynaecologists

Setting standards to improve women's health

Section A: Blood transfusion

1. **Did this woman receive a blood transfusion within 48 hours of the birth?** Yes ☐ No ☐

   If No, *please go to section B.*

2. **When was the first blood transfusion given?**

   Was this? *Please tick one box*

   - Intrapartum ☐
   - End of third stage – 23 hours after birth ☐
   - 24 – 48 hours after birth ☐

3. **How many units of whole blood or packed cells did this woman receive?** ☐☐

4. **Was a cell saver used?** Yes ☐ No ☐

   If Yes, please give the volume of patient's blood transfused: ☐☐☐☐ ml

5. **What was the lowest postnatal haemoglobin recorded for this woman?** ☐☐.☐ g/dl

6. **What was the primary reason for the blood transfusion?** *Please tick one only*

   - Uterine atony ☐
   - Genital tract trauma ☐
   - Morbidly adherent placenta ☐
   - Infection ☐
   - Anaemia ☐
   - Retained products ☐
   - Other ☐

   If Other, please give details _____

Section B: High dependency, intensive or specialist care

1. **Within the first 48 hours after the birth was this woman admitted to a higher level of care?** Yes ☐ No ☐

   If No, *please go to section C.*

2. **What type of higher level care did this woman receive?** *Please tick all that apply*

   - High dependency unit or area ☐
   - Intensive care unit ☐
   - Specialist unit e.g. dialysis unit ☐

   Type of specialist unit _____

If you have ticked any of the above boxes, *please continue completing this section.*

If Not, *please go to next section.*

3. Please give details of length of stay and reasons for admission to higher level care:

Type of unit	Date of admission	Date of discharge	Main reason for admission	Treatment(s) received
	D D / M M / Y Y	D D / M M / Y Y		
	D D / M M / Y Y	D D / M M / Y Y		
	D D / M M / Y Y	D D / M M / Y Y		
	D D / M M / Y Y	D D / M M / Y Y		
	D D / M M / Y Y	D D / M M / Y Y		

Section C: Maternal mortality

1. Was this woman registered as a maternal death (within 42 days of giving birth)? Yes ☐ No ☐

   If No, *please go to section D.*

2. Date and time of maternal death D D / M M / Y Y H H : M M

3. Where did this woman die?

- Obstetric unit ☐
- Alongside midwifery unit ☐
- Freestanding midwifery unit ☐
- Home ☐
- High dependency unit/area ☐
- Intensive care unit ☐
- Other hospital ward or department ☐

If Other, please give details _____

4. Has a cause of death been identified? Yes ☐ No ☐

   If Yes, please provide details:

   _____

   _____

   _____

5. Has a postmortem been performed? Yes ☐ No ☐

Section D: Stillbirth

1. **Was this baby registered as a stillbirth?** Yes ☐ No ☐

   If No, *please go to section E.*

2. **Was a fetal heartbeat heard at labour onset?** Yes ☐ No ☐

3. **If this was an intrapartum stillbirth, was stillbirth diagnosed in?**

   - First stage of labour ☐
   - Second stage of labour ☐
   - Other ☐

   If Other, please give details: _____

4. **Has a cause of death been identified?** Yes ☐ No ☐

   If Yes, please provide details:

   _____

   _____

   _____

5. **Has a postmortem been performed?** Yes ☐ No ☐

Section E: Other details

Please check the form and add any additional information that you think might be relevant about this delivery, the mother or the fetus/baby.

_____

_____

_____

_____

Form continues on next page. P.T.O.

Confirmation of significant maternal morbidity or mortality

1. **Have at least one of the outcomes listed below been identified for this woman or baby?** Yes ☐ No ☐
   - Blood transfusion (Section A)
   - Maternal admission or mortality (Sections B & C)
   - Stillbirth (Section D)

   If No, were any of the above conditions suspected but not confirmed on investigation? Yes ☐ No ☐

   If Yes, please give details

   _____

   _____

   _____

   If No, please tick the **blue** box on the front page and give any relevant details below

   _____

   _____

   _____

Job title of person completing this form _____

Date form completed D D M M Y Y

Affix BACK PAGE sticker here

Thank you very much for completing this form.

If you have any questions, please contact the Birthplace office:

Birthplace Project Manager
FREEPOST RRKH-XXAB-JJLK
Birthplace in England Research Programme
National Perinatal Epidemiology Unit
University of Oxford
Old Road Campus
Oxford
OX3 7LF

Tel: 01865 289748
Fax: 01865 289758
Email: birthplace@npeu.ox.ac.uk

MREC ref: 07/H0505/151
V1 01/2010

Appendix 4: Categorisation of potential confounders

The potential confounders used in the adjusted analyses to take into account differences in the maternal characteristics between the groups were maternal age, ethnicity, understanding of English, marital or partner status, body mass index (BMI) in pregnancy, Index of Multiple Deprivation score, parity and gestation at delivery. Quantitative variables were treated as unordered categorical variables because it was not assumed that there was a linear relationship between the any of the potential confounders and the incidence of the primary outcome. The categories used were either recommended categories or categories used commonly in other research in the field.[28] For analyses of the primary outcome, Indian and Bangladeshi women were grouped together because of the small number of Bangladeshi women in the sample and because outcomes are similar in these groups.[29]

Table 4.1: Categorisation of potential confounders

Covariate	Response categories	
Maternal age	1	Less than 20 years
	2	20 to 24 years
	3	25 to 29 years
	4	30 to 34 years
	5	35 to 39 years
	6	40+ years
Ethic group	1	White
	2	Indian or Bangladeshi*
	3	Pakistani
	4	Black Caribbean
	5	Black African
	6	Mixed
	7	Other
Understanding of English	1	Fluent
	2	Some understanding/able to communicate verbally
	3	No understanding/not able to communicate verbally
Marital or partner status	1	Married/living with partner
	2	Single/unsupported by partner
BMI in pregnancy (Kg/m^2)	0	Not recorded
	1	Less than 18·5
	2	18·5 to 24·9
	3	25·0 to 29·9
	4	30·0 to 35·0
	5	>35·0 (`higher risk' group only)†
Index of Multiple Deprivation score	1	1st quintile (least deprived)
	2	2nd quintile
	3	3rd quintile
	4	4th quintile
	5	5th quintile (most deprived)
Parity (Previous pregnancies ≥24 weeks)	1	Nulliparous
	2	1 previous
	3	2 previous
	4	3 or more previous
Gestation at delivery	1	37 weeks
	2	38 weeks
	3	39 weeks
	4	40 weeks
	5	41 weeks
	6	42 to 44 weeks

* For analyses of the primary outcome, Indian and Bangladeshi women were grouped together because of the small number of Bangladeshi women in the sample and similar outcomes in these groups.[29]

† The cut-off of a BMI greater than or equal to 35·0 kg/m^2 as putting the woman or baby at 'higher risk' was taken from the NICE Obesity guideline.[28]

Appendix 5: Sensitivity analysis, trusts/units with a response rate of at least 85%

To gauge whether the results are likely to have been affected by non-response bias, the analysis of the primary outcome for 'low risk' women was repeated, restricting the sample to units and trusts that included at least 85% of eligible women.

74% (203/271) of participating units and trusts included 85% or more of eligible women (Table 5.1). This sensitivity analysis was restricted to the 203 units and trusts that included 85% or more of eligible women.

Table 5.1: Proportion of units and trusts with a response rate >=85% by planned place of birth

	Response rate				Poor or missing denominator		Total
	<85%		>=85%				
	n	%	n	%	n	%	n
OU	11	31	24	67	1	3	36
Home	16	11	113	80	13	9	142
FMU	13	25	35	66	5	9	53
AMU	7	16	31	72	5	12	43
Total	47	17	203	74	24	9	274

Units/trusts that provided denominator data, which enabled a response rate to be calculated, included a higher proportion of women than units with 'poor or missing' denominator data. The 9% of units/trusts (n=24) with 'poor or missing' denominator data contributed only 3% of births (n=2587) to the study sample (Table 5.2).

Table 5.2: Proportion of women included by response rate and planned place of birth

	Response rate				Poor or missing denominator		Total
	<85%		>=85%				
	n	%	n	%	n	%	n
OU	8513	26	23230	72	514	2	32257
Home	1446	8	15883	87	940	5	18269
FMU	1479	13	9858	85	329	3	11666
AMU	3077	18	13701	78	804	5	17582
Total	14515	18	62672	79	2587	3	79774

The 203 units with a response rate of at least 85% also had higher return rates for the neonatal and maternal morbidity forms compared with all participating units and trusts (96% vs. 94% neonatal forms returned; 96% vs. 93% maternal forms returned, Table 5.3).

Table 5.3: Morbidity form return rates for units/trusts with response rate of at least 85%

	Neonatal morbidity forms				
	Returned		Not returned		Total
	n	%	n	%	n
OU	1054	98	17	2	1071
Home	423	97	14	3	437
FMU	265	95	15	5	280
AMU	343	92	30	8	373
Total	2085	96	76	4	2161

	Maternal morbidity forms				
	Returned		Not returned		Total
	n	%	n	%	n
OU	578	98	10	2	588
Home	192	94	12	6	204
FMU	134	94	9	6	143
AMU	211	93	17	7	228
Total	1115	96	48	4	1163

The effect of planned place of birth on the primary outcome in this restricted subset of units/trusts with a response rate of at least 85% was consistent with the results of the primary analysis of all 'low risk' women. The weighted event rates were similar to the primary analysis for both the all 'low risk' women analysis and the analysis of 'low risk' women without complicating conditions at the start of care in labour (Table 5.4).

Overall for all 'low risk' women, there were no statistically significant differences in the odds of a primary outcome event by planned place of birth. For the restricted analysis of 'low risk' women without complicating conditions at the start of care in labour, there was an increase in the odds of a primary outcome event in the planned home birth group (adjusted OR 1·90, 95% CI 1·11 to 3·25, Table 5.4).

When stratified by parity, the apparent increased odds of a primary outcome event for nulliparous women in the planned home birth group remained in the analysis of all 'low risk' women (adjusted OR 2·18, 95% CI 1·27 to 3·76) and the analysis of 'low risk' women without complicating conditions (adjusted OR 4·65, 95% CI 2·42 to 8·92).

In this analysis restricted to centres with a response rate of at least 85%, there was an apparent increase in the odds of a primary outcome event for nulliparous 'low risk' women without complicating conditions in the planned FMU group (adjusted OR 2·29, 95% CI 1·17 to 4·47).

Table 5.4: Primary outcome for babies of 'low risk' women restricted to units with a response rate of at least 85%

	Events	Births	Incidence*		Unadjusted*		Unadjusted*,†		Adjusted*,‡	
	n	n	n/1000	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
All 'low risk' women						n=51123		n=49886		n=49886
OU	62	14253	4·6	(3·3-6·4)	1	-	1	-	1	-
Home	67	14504	4·8	(3·7-6·1)	1·04	(0·68-1·59)	1·05	(0·69-1·60)	1·33	(0·84-2·10)
FMU	37	9475	4·1	(2·9-5·7)	0·89	(0·55-1·43)	0·91	(0·57-1·46)	1·09	(0·69-1·73)
AMU	44	12891	3·4	(2·4-4·7)	0·74	(0·46-1·18)	0·76	(0·48-1·21)	0·86	(0·56-1·31)
Total	210	51123	4·4	(3·3-5·9)						
All 'low risk' women by parity¥										
Nulliparous women						n=22604		n=22078		n=22078
OU	38	7740	5·3	(3·6-7·7)	1	-	1	-	1	-
Home	38	3983	10·6	(7·5-15·0)	2·01	(1·20-3·38)	2·04	(1·24-3·36)	2·18	(1·27-3·76)
FMU	22	4384	5·2	(3·4-8·0)	0·98	(0·55-1·76)	0·99	(0·56-1·74)	1·15	(0·66-2·02)
AMU	27	6497	4·0	(2·7-6·0)	0·75	(0·43-1·31)	0·77	(0·45-1·33)	0·87	(0·52-1·45)
Total	125	22604	5·3	(3·8-7·3)						
Multiparous women						n=28457		n=27808		n=27808
OU	24	6503	3·7	(2·4-5·8)	1	-	1	-	1	-
Home	29	10509	2·5	(1·8-3·6)	0·68	(0·38-1·20)	0·68	(0·38-1·22)	0·75	(0·41-1·36)
FMU	15	5077	3·1	(1·8-5·3)	0·84	(0·41-1·70)	0·88	(0·43-1·79)	0·99	(0·49-2·00)
AMU	17	6368	2·7	(1·5-5·1)	0·74	(0·34-1·59)	0·78	(0·36-1·69)	0·83	(0·39-1·74)
Total	85	28457	3·5	(2·4-5·1)						
'Low risk' women without complicating conditions at the start of care in labour										
						n=46116		n=45006		n=45006
OU	35	11505	3·0	(2·0-4·4)	1	-	1	-	1	-
Home	59	13620	4·5	(3·4-5·9)	1·51	(0·94-2·45)	1·58	(0·98-2·56)	1·90	(1·11-3·25)
FMU	31	8950	3·6	(2·5-5·1)	1·21	(0·72-2·06)	1·29	(0·77-2·18)	1·52	(0·91-2·52)
AMU	41	12041	3·1	(2·2-4·5)	1·05	(0·62-1·79)	1·13	(0·66-1·92)	1·25	(0·76-2·04)
Total	166	46116	3·1	(2·3-4·2)						
'Low risk' women without complicating conditions at the start of care in labour by parity±										
Nulliparous women						n=19577		n=19119		n=19119
OU	17	5947	2·8	(1·7-4·5)	1	-	1	-	1	-
Home	35	3611	10·8	(7·5-15·6)	3·88	(2·12-7·12)	4·10	(2·28-7·38)	4·65	(2·42-8·92)
FMU	20	4074	5·2	(3·3-8·3)	1·85	(0·95-3·63)	1·95	(1·01-3·75)	2·29	(1·17-4·47)
AMU	24	5945	3·4	(2·2-5·2)	1·21	(0·64-2·29)	1·29	(0·69-2·40)	1·47	(0·79-2·73)
Total	96	19577	3·2	(2·2-4·5)						
Multiparous women						n=26484		n=25887		n=25887
OU	18	5552	3·2	(1·8-5·5)	1	-	1	-	1	-
Home	24	9998	2·2	(1·5-3·2)	0·69	(0·35-1·36)	0·70	(0·35-1·39)	0·78	(0·40-1·54)
FMU	11	4864	2·3	(1·3-4·0)	0·73	(0·33-1·60)	0·78	(0·36-1·72)	0·89	(0·42-1·88)
AMU	17	6070	2·9	(1·5-5·3)	0·91	(0·39-2·09)	0·98	(0·43-2·27)	1·05	(0·47-2·37)
Total	70	26484	3·0	(1·9-4·8)						

* Weighted to reflect each unit's duration of participation, the sampling of obstetric units and to take the clustered nature of the data into account.

† Restricted to women included in the adjusted analysis.

‡ Adjusted for maternal age, ethnic group, understanding of English, marital/partner status, body mass index, Index of Multiple Deprivation score quintile, previous pregnancies >=24 completed weeks, and gestation (completed weeks).

¥ All 'low risk' by parity adjusted regression tests of heterogeneity p-values: Overall 0·02; Pairwise: Home 0·005 ; FMU 0·72 ; AMU 0·92

± 'Low risk' without complicating conditions at the start of care in labour by parity adjusted regression tests of heterogeneity p-values: Overall <0·001; Pairwise: Home <0·001 ; FMU 0·07 ; AMU 0·53

Appendix 6: Sensitivity analysis, propensity score analysis

Propensity score analysis

In the 'low risk' group of women, a sensitivity analysis was carried out using propensity scores to examine in more detail the impact on the results of the differences in the characteristics of the women in the different groups. These analyses were carried out separately for each non-OU setting compared with the OU group.

We summarised the imbalance in baseline characteristics, maternal characteristics and complicating conditions identified at the start of care in labour, between each non-OU group and the OU group using standardised differences (Figure 6.1, Figure 6.2, and Figure 6.3). Categorical variables were collapsed into binary variables and standardised differences in proportions were calculated. For continuous variables, standardised differences in means were calculated. A standardised difference of more than 10% indicates serious imbalance.[30] There were a higher proportion of women with complicating conditions identified at the start of care in labour in the OU group compared with all other planned places of birth. In particular, a higher proportion of women in the OU group had prolonged rupture of membranes (for longer than 18 hours) and meconium stained liquor. There were also large differences in the socio-demographic characteristics of women who planned to give birth in an FMU or at home compared with the OU group. Women in the planned home and FMU groups were more likely to be White, have a fluent understanding of English, to live in a more socioeconomically advantaged area, to be older, and married or living with their partner. The most striking differences were in the age and parity of women in the home group compared with the women in the OU group: they tended to be older and more likely to have given birth previously.

For each non-OU/OU comparison, a propensity score was calculated for each woman which represents the probability that the woman would plan to give birth in the non-OU setting, based on her maternal characteristics and any complicating conditions identified at the start of care in labour. The distribution of the propensity scores for the three non-OU/OU comparisons are presented in Figure 6.4, Figure 6.5, and Figure 6.6. For each figure, a low propensity score indicates a low propensity to plan birth in the non-OU setting. Conversely, a high propensity score indicates a high propensity to plan birth in the non-OU setting. Most of the women in the OU group had a low propensity to plan a home birth, and most of the women in the home group had a high propensity to plan a home birth. The distributions of propensity scores for the midwifery units were more similar to the OU group, particularly in the AMU group which reflects the similar characteristics of the women in the AMU and OU groups.

Women were divided into quintiles based on the rank of their propensity scores. The covariate imbalance was compared within each propensity score quintile (Figure 6.7, Figure 6.8, and Figure 6.9). Good balance was achieved in quintiles 2 to 5 for each comparison. Quintile 1, which contains women with the lowest propensity to plan birth in the non-OU setting, was still not well-balanced for some covariates after stratification by propensity score quintile. For planned home births, the remaining imbalance in quintile 1 was due to socio-demographic characteristics. For both types of midwifery unit, the remaining imbalance in quintile 1 was due to complicating conditions identified at the start of care in labour.

The analysis of the primary outcome was repeated within each propensity score quintile for each non-OU/OU comparison (Table 6.1, Table 6.2 and Table 6.3). Unadjusted odds ratios are presented, as the numbers of events in each quintile were too small to perform a reliable adjusted analysis. The incidence of the primary outcome was lower for women whose characteristics were consistent with a high probability of planning birth in a non-OU setting. The quintile containing women with the lowest propensity to plan birth outside of an OU had the highest incidence of the primary outcome. This was observed for all planned places of birth, including OUs. There were no discernable patterns or trends evident in the quintile specific odds ratios. Tests for heterogeneity showed no evidence of a difference between the quintile specific odds ratios for each planned place of birth.

Figure 6.1: Covariate imbalance between planned home births and planned obstetric unit births

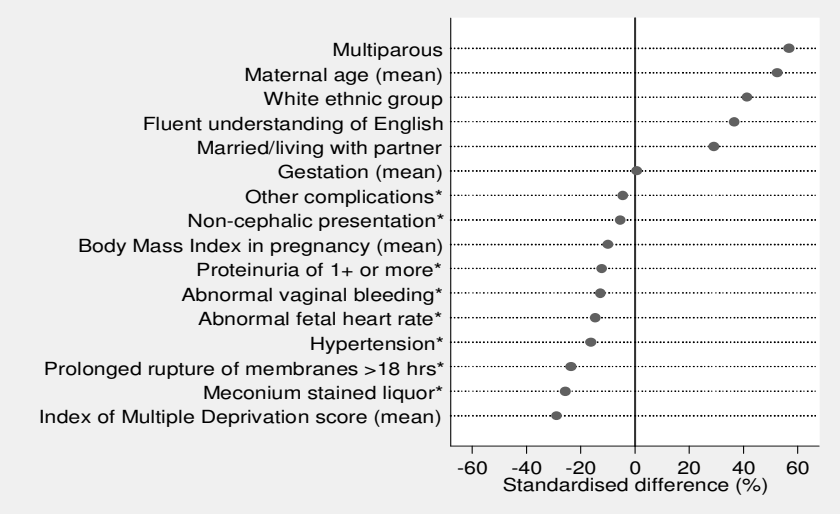


Figure 6.2: Covariate imbalance between planned alongside midwifery unit births and planned obstetric unit births

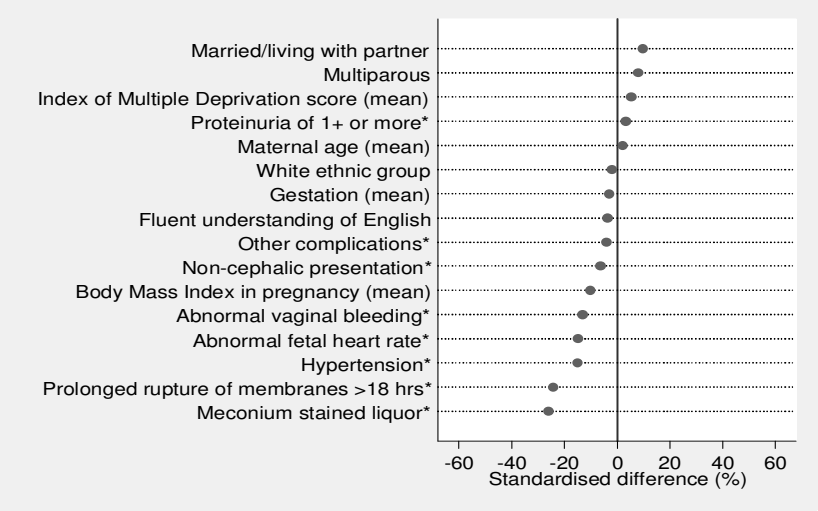
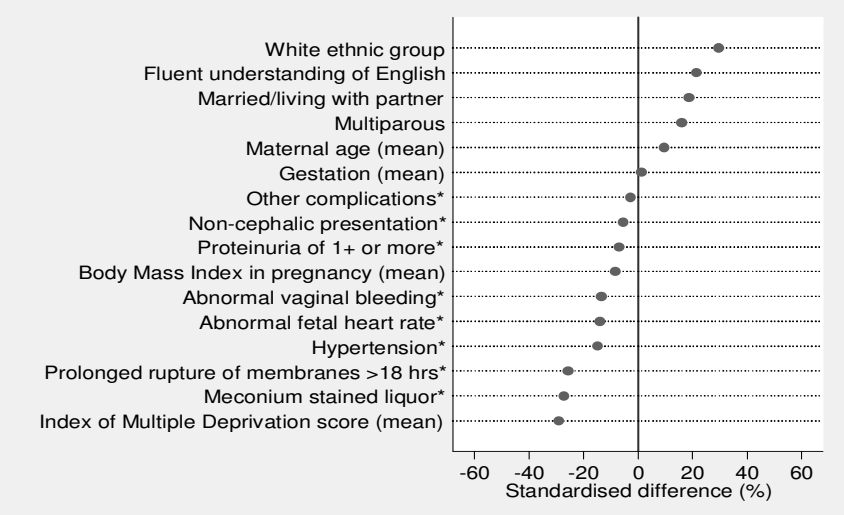


Figure 6.3: Covariate imbalance between planned freestanding midwifery unit births and planned obstetric unit births



* Complicating conditions identified at the start of care in labour.

Figure 6.4: Distribution of propensity scores for planned home births and planned obstetric unit births

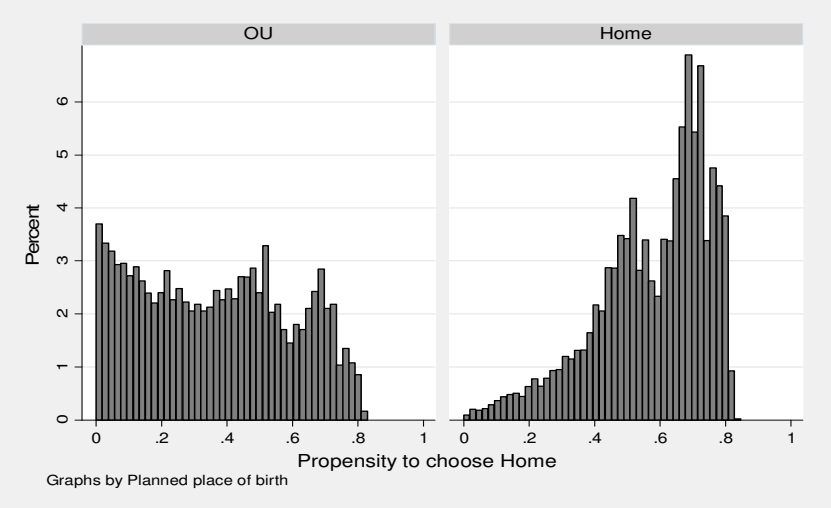


Figure 6.5: Distribution of propensity scores for planned alongside midwifery unit births and planned obstetric unit births

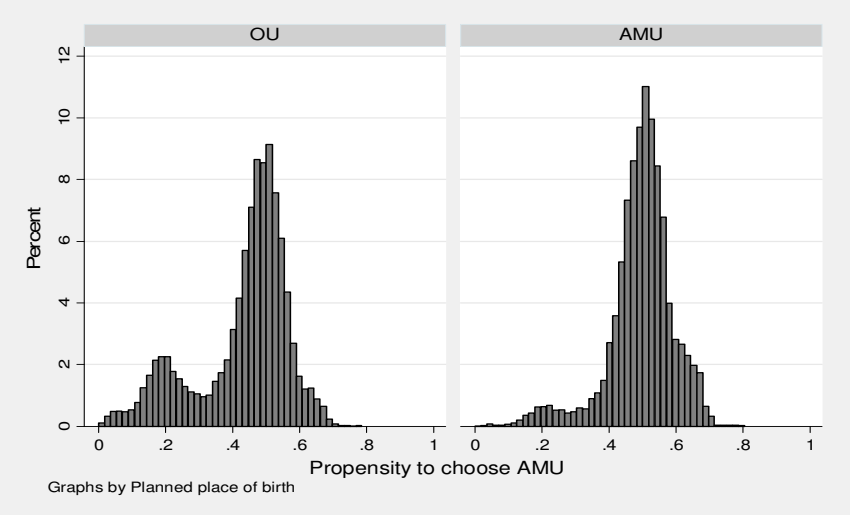


Figure 6.6: Distribution of propensity scores for planned freestanding midwifery unit births and planned obstetric unit births

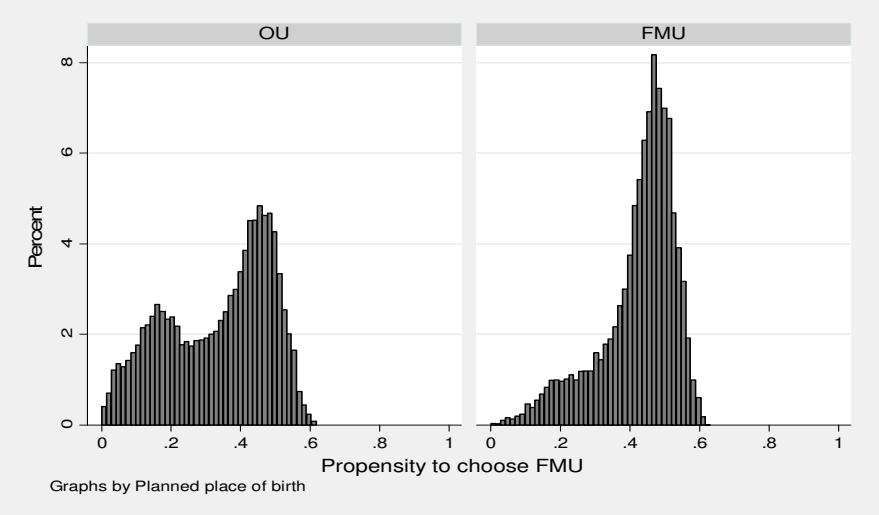
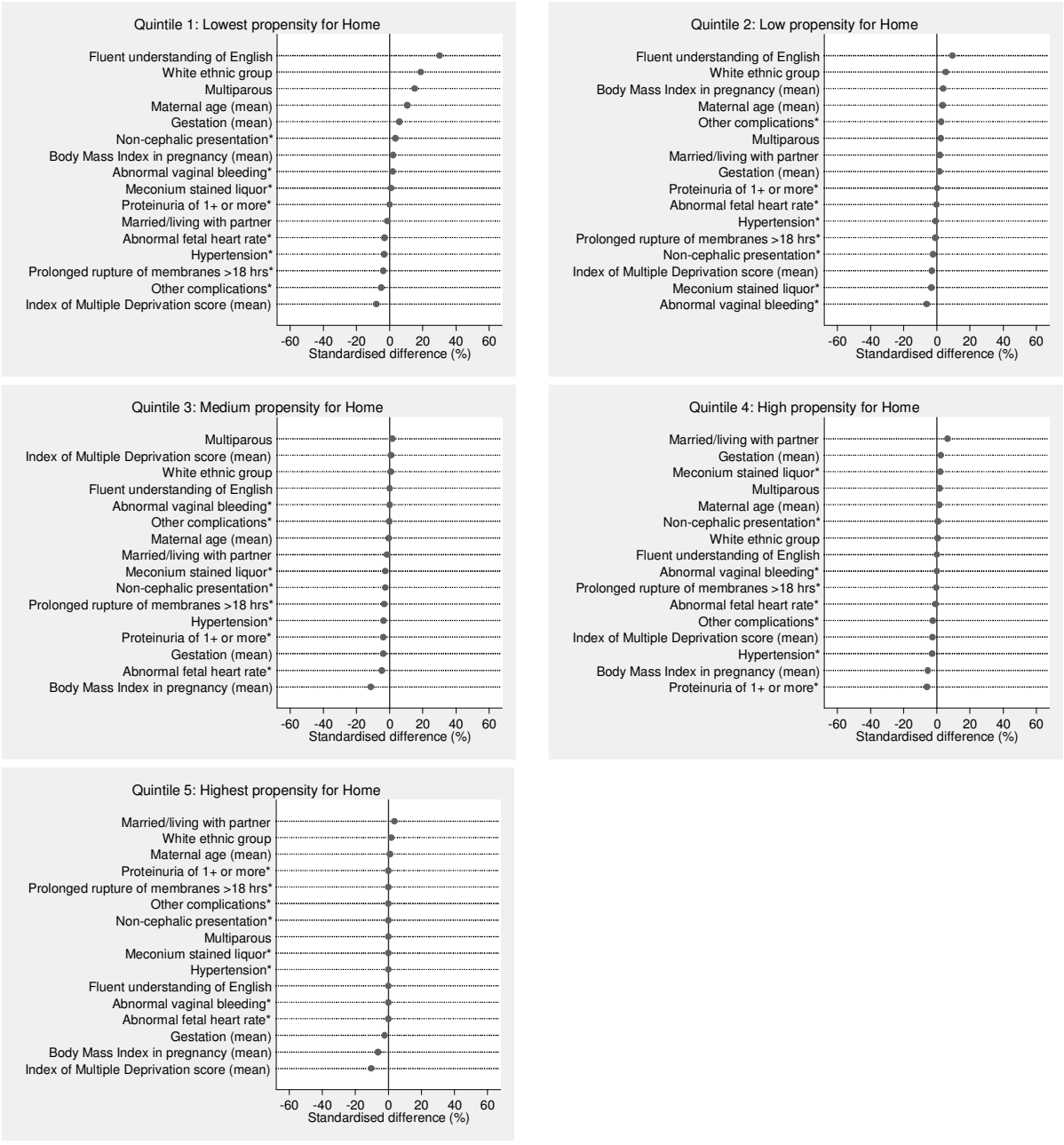
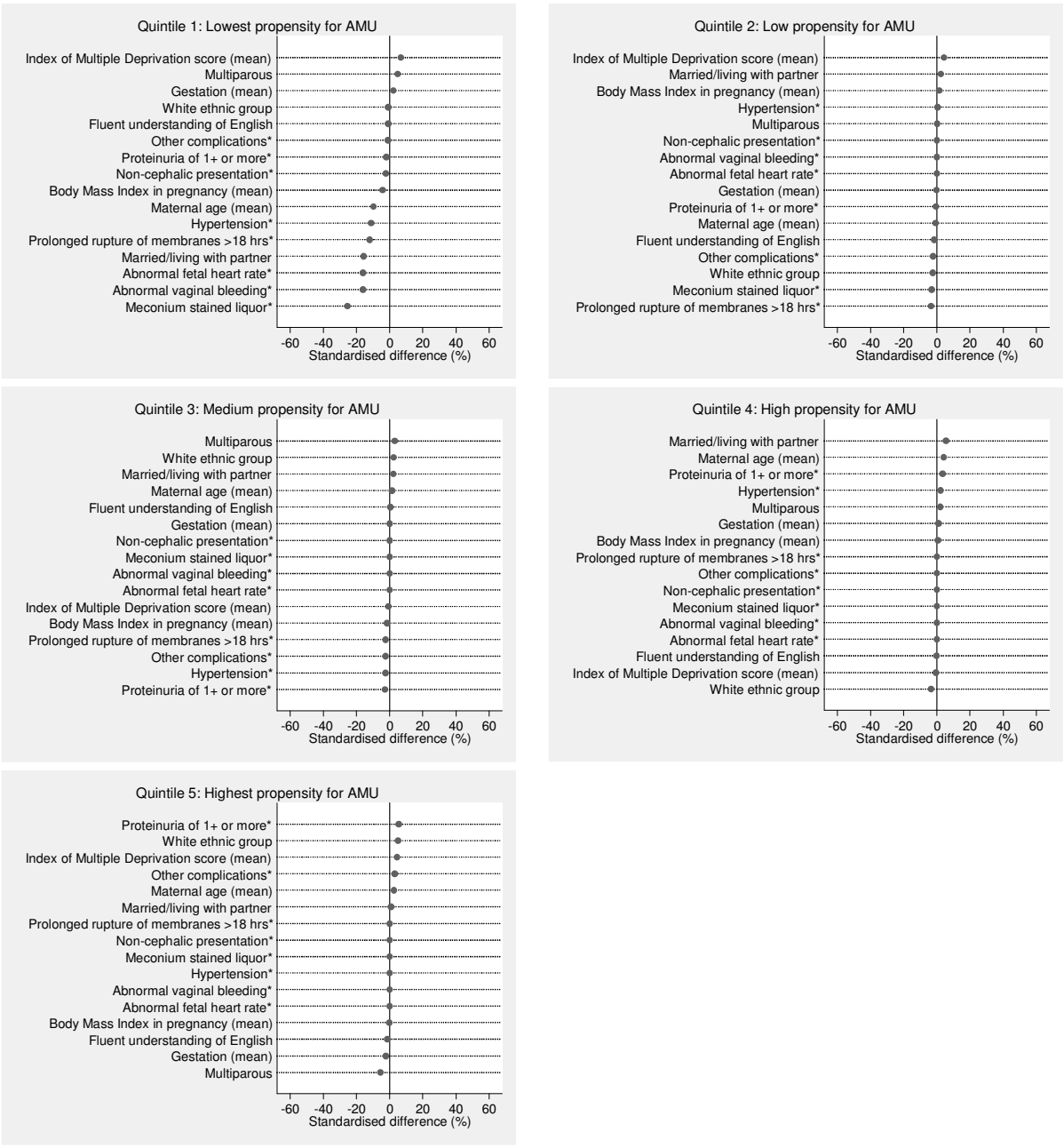


Figure 6.7: Covariate imbalance between planned home births and planned OU births within propensity score quintile



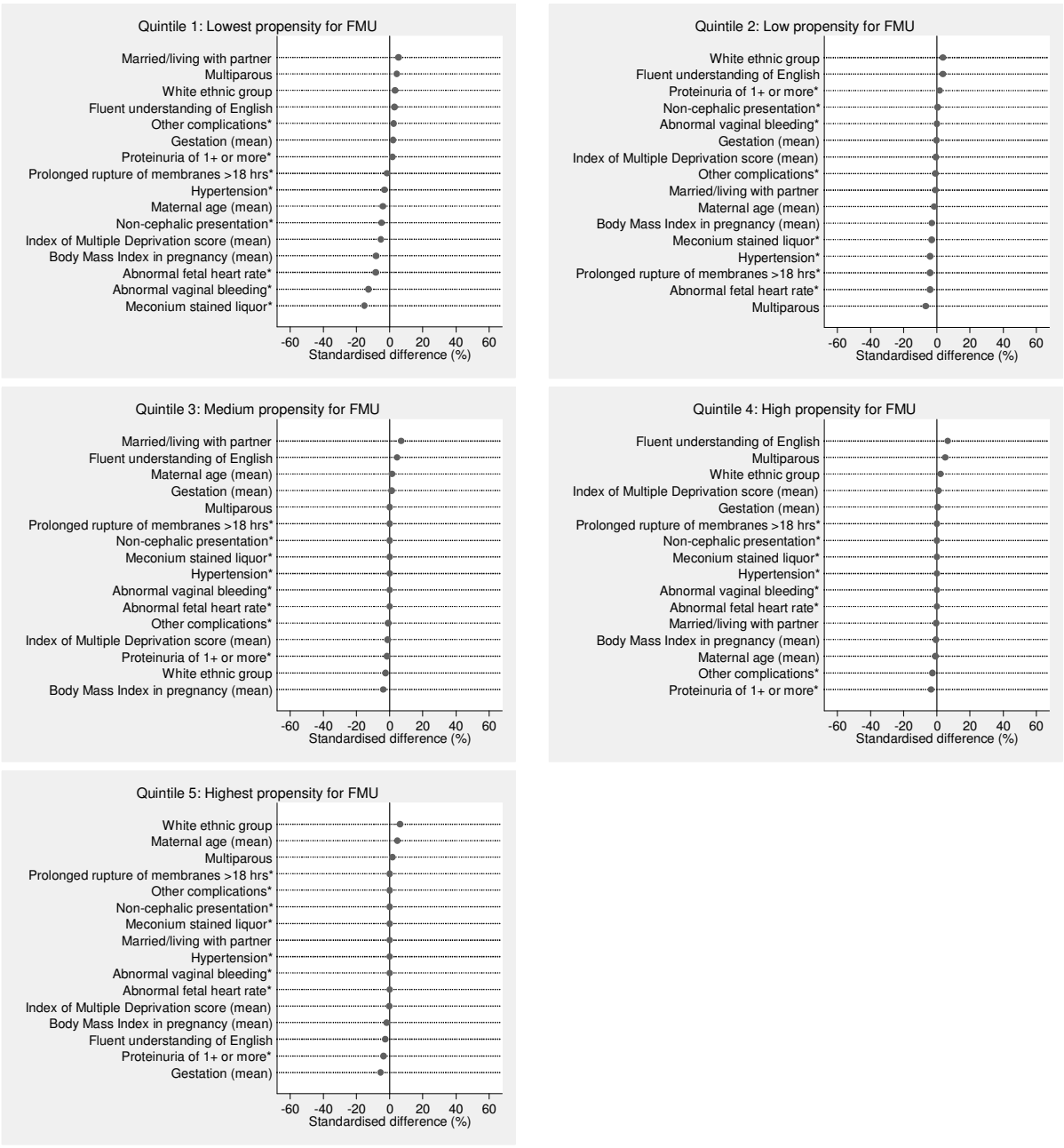
* Complicating conditions identified at the start of care in labour.

Figure 6.8: Covariate imbalance between planned alongside midwifery unit births and planned obstetric unit births within propensity score quintile



* Complicating conditions identified at the start of care in labour.

Figure 6.9: Covariate imbalance between planned freestanding midwifery unit births and planned obstetric unit births within propensity score quintile



* Complicating conditions identified at the start of care in labour.

Table 6.1: Primary outcome for babies of all 'low risk' women for planned home births compared with planned obstetric unit births by propensity score quintile

Propensity to plan birth at home			Obstetric unit			Home			Unadjusted*	
	Propensity score		Events	Births	Incidence	Events	Births	Incidence		
quintile	median	[range]	n	n	n/1000*	n	n	n/1000*	OR	(95% CI)
1 Lowest	0·11	[0·00, 0·22]	37	6291	6·5	6	696	7·1	1·09	(0·42-2·83)
2 Low	0·34	[0·22, 0·43]	17	4734	3·9	12	2258	7·7	1·98	(0·77-5·09)
3 Medium	0·49	[0·43, 0·56]	17	3354	4·9	26	3604	5·9	1·22	(0·65-2·27)
4 High	0·64	[0·56, 0·69]	5	2595	1·7	13	4358	3·4	2·00	(0·74-5·42)
5 Highest	0·74	[0·69, 0·85]	3	1820	1·4	12	5149	1·9	1·34	(0·37-4·79)
Overall	0·49	[0·00, 0·85]	79	18,794	4·4	69	16,065	4·3	1·50	(0·99-2·27)†

* Weighted to reflect each unit's duration of participation, the sampling of obstetric units and to take the clustered nature of the data into account.
† Overall OR, weighted and adjusted for quintile. Test of heterogeneity across quintiles p value = 0·84 (Wald test).

Table 6.2: Primary outcome for babies of all 'low risk' women for planned alongside midwifery unit births compared with planned obstetric unit births by propensity score quintile

Propensity to plan birth at an AMU			Obstetric unit			Alongside midwifery unit			Unadjusted*	
	Propensity score		Events	Births	Incidence	Events	Births	Incidence		
quintile	median	[range]	n	n	n/1000*	n	n	n/1000*	OR	(95% CI)
1 Lowest	0·24	[0·00, 0·40]	39	5245	8·4	11	1726	7·4	0·88	(0·35-2·18)
2 Low	0·44	[0·40, 0·47]	18	3851	4·4	15	3109	4·9	1·14	(0·53-2·46)
3 Medium	0·49	[0·47, 0·51]	7	3580	1·9	12	3378	3·2	1·72	(0·70-4·21)
4 High	0·53	[0·51, 0·55]	9	3327	2·9	8	3618	1·3	0·43	(0·13-1·39)
5 Highest	0·58	[0·55, 0·80]	6	2791	2·3	12	4171	3·8	1·68	(0·50-5·61)
Overall	0·49	[0·00, 0·80]	79	18,794	4·4	58	16,002	3·7	1·09	(0·69-1·72)†

* Weighted to reflect each unit's duration of participation, the sampling of obstetric units and to take the clustered nature of the data into account.
† Overall OR, weighted and adjusted for quintile. Test of heterogeneity across quintiles p value = 0·34 (Wald test).

Table 6.3: Primary outcome for babies of all 'low risk' women for planned freestanding midwifery unit births compared with planned obstetric unit births by propensity score quintile

Propensity to plan birth at an FMU			Obstetric unit			Freestanding midwifery unit			Unadjusted*	
	Propensity score		Events	Births	Incidence	Events	Births	Incidence		
quintile	median	[range]	n	n	n/1000*	n	n	n/1000*	OR	(95% CI)
1 Lowest	0·14	[0·00, 0·22]	38	5169	8·0	8	789	9·3	1·17	(0·62-2·19)
2 Low	0·30	[0·22, 0·37]	14	4169	3·4	9	1791	5·5	1·61	(0·69-3·76)
3 Medium	0·41	[0·37, 0·44]	11	3566	3·5	6	2397	2·1	0·58	(0·22-1·52)
4 High	0·47	[0·44, 0·49]	12	3100	3·6	13	2844	3·9	1·09	(0·47-2·52)
5 Highest	0·52	[0·49, 0·62]	4	2790	1·2	5	3139	2·0	1·67	(0·44-6·40)
Overall	0·41	[0·00, 0·62]	79	18,794	4·4	41	10,960	3·6	1·14	(0·73-1·77)†

* Weighted to reflect each unit's duration of participation, the sampling of obstetric units and to take the clustered nature of the data into account.
† Overall OR, weighted and adjusted for quintile. Test of heterogeneity across quintiles p value = 0·31 (Wald test).

Appendix 7: Summary of missing data

Risk status

Data regarding whether the woman was known to have any 'risk factors', prior to the onset of labour, were recorded for over 99% of the 79,774 eligible women for whom data were collected. Only 451 women in the sample had missing 'risk status' and these data were missing for fewer than 1% of women in each setting (Table 7.1).

Table 7.1: Summary of missing 'risk status' data for all women by planned place of birth

Unit type	Risk status missing n	%	Total births n
OU	177	0·5	32257
Home	83	0·5	18269
FMU	95	0·8	11666
AMU	96	0·5	17582
Total	451	0·6	79774

Primary outcome and confounders

Overall, 711 births from 'low risk' women (1·1%) had a missing primary outcome and were excluded from the unadjusted estimates of the incidence of the primary outcome (Table 7.2).

For the adjusted analyses, births were excluded where any data for potential confounders were missing. Of all births from 'low risk' women, 2·9% (1903 births) were missing some confounder data (Table 7.2).
Taking both the missing primary outcome data and missing confounder data into account, 3·9% of 'low risk' births (2502) were excluded from the primary analysis (Table 7.2). In each setting, the completeness of data collection was good with over 95% of 'low risk' women included in the primary adjusted analyses.

Table 7.2: Summary of missing data for all 'low risk' women by planned place of birth

Unit type	All 'low risk' n	Primary outcome missing n	%	Confounder missing n	%	Primary analysis Excluded* n	%	Included n	%
OU	19706	155	0·8	724	3·7	859	4·4	18847	95·6
Home	16840	287	1·7	414	2·5	653	3·9	16187	96·1
FMU	11282	83	0·7	241	2·1	311	2·8	10971	97·2
AMU	16710	186	1·1	524	3·1	679	4·1	16031	95·9
Total	64538	711	1·1	1903	2·9	2502	3·9	62036	96·1

* Births were excluded if either the primary outcome or any of the potential confounders was missing·

One observation with a primary outcome recorded was dropped from both the unadjusted and adjusted analyses because the woman's 'risk status' was missing. This birth was planned in an AMU and the outcome was a clinical diagnosis of neonatal encephalopathy.

Three births with a primary outcome recorded were dropped from the adjusted analyses due to missing confounder data (1·2% of the 250 primary outcome events for 'low risk' births). Two were planned OU births (one meconium aspiration syndrome and one clinical neonatal encephalopathy); one was a planned home birth (clinical diagnosis of neonatal encephalopathy).

The primary outcome was coded as missing where at least one component of the primary outcome was missing and no other components were recorded as having occurred. Three questions on the data collection forms contributed to the primary outcome: a question listing 13 neonatal morbidities with an option 'no morbidity identified', a Yes/No question about death at the time the form was completed, and a Yes/No question about whether there was a stillbirth. The majority of births where the primary outcome was missing had the neonatal morbidity question left blank (0·9%, 583 observations), fewer observations had the death question left blank (0·4%, 246 observations), and the stillbirth question was missing for 3 observations (Table 7.3). Both the

neonatal morbidity question and death question were in a section of the form relating to adverse outcomes and it may be that where no morbidity was observed these questions were more likely to be left incomplete.

Table 7.3: Missing primary outcome data for all 'low risk' women by planned place of birth

	Missing component of the primary outcome						Primary outcome data complete		All 'low risk'
	A neonatal morbidity		Early neonatal death		Stillbirth				
Unit type	n	%	n	%	n	%	n	%	n
OU	119	0·6	69	0·4	0	-	19551	99·2	19706
Home	251	1·5	81	0·5	1	0·0	16553	98·3	16840
FMU	72	0·6	19	0·2	0	-	11199	99·3	11282
AMU	141	0·8	77	0·5	2	0·0	16524	98·9	16710
Total	583	0·9	246	0·4	3	0·0	63827	98·9	64538

Women's marital or partner status was the confounder with the most missing data, 1·2% overall for 'low risk' women. The OU (1·6% missing) and AMU (1·5% missing) groups had the highest proportion of missing data for this variable. All other potential confounders had fewer than 1·0% missing data both overall and for each planned place of birth (Table 7.4).

Table 7.4: Missing data for potential confounders for all 'low risk' women by planned place of birth

	Missing data for potential confounders									
	OU n=19706		Home n=16840		FMU n=11282		AMU n=16710		Total n=64538	
Potential confounders	n	%	n	%	n	%	n	%	n	%
Maternal age	25	0·1	34	0·2	14	0·1	38	0·2	111	0·2
Ethnicity	27	0·1	21	0·1	5	0	37	0·2	90	0·1
Understanding of English	152	0·8	26	0·2	27	0·2	64	0·4	269	0·4
Marital or partner status	320	1·6	111	0·7	120	1·1	243	1·5	794	1·2
BMI in pregnancy	55	0·3	94	0·6	17	0·2	66	0·4	232	0·4
Index of multiple deprivation score	126	0·6	118	0·7	31	0·3	48	0·3	323	0·5
Parity	31	0·2	16	0·1	17	0·2	37	0·2	101	0·2
Gestation	56	0·3	41	0·2	27	0·2	55	0·3	179	0·3

The proportion of births with missing primary outcome data was less than 2% for every potential confounder variable overall and within each category of the potential confounders (Table 7.5). There was a much higher proportion of missing primary outcome data for births that also had missing confounder data.

Table 7.5: Distribution of missing primary outcome data for all 'low risk' women by baseline characteristic

Potential confounders	Primary outcome				Total births
	Not missing		Missing		
	n	%	n	%	n
	63827	98·9	711	1·1	64538
Maternal age					
Under 20	3434	99·0	36	1·0	3470
20-24	11477	99·1	101	0·9	11578
25-29	18138	99·0	177	1·0	18315
30-34	18525	98·8	216	1·2	18741
35-39	10446	98·7	133	1·3	10579
40+	1716	98·4	28	1·6	1744
Missing	91	82·0	20	18·0	111
Ethnic group					
White	55185	98·9	634	1·1	55819
Indian or Bangladeshi	1714	99·2	14	0·8	1728
Pakistani	1379	99·5	7	0·5	1386
Black Caribbean	633	99·2	5	0·8	638
Black African	1385	99·2	11	0·8	1396
Mixed	1016	99·1	9	0·9	1025
Other	2434	99·1	22	0·9	2456
Missing	81	90·0	9	10·0	90
Understanding of English					
Fluent	60216	98·9	675	1·1	60891
Some	2633	99·2	21	0·8	2654
None	719	99·3	5	0·7	724
Missing	259	96·3	10	3·7	269
Marital/partner status					
Married/living with partner	57965	98·9	646	1·1	58611
Single or unsupported by partner	5094	99·2	39	0·8	5133
Missing	768	96·7	26	3·3	794
Body mass index in pregnancy (kg/m^2)					
Not recorded	11505	99·0	117	1·0	11622
Less than 18·5	1547	99·0	16	1·0	1563
18·5-24·9	30516	99·0	318	1·0	30834
25·0-29·9	14774	98·8	175	1·2	14949
30·0-35·0	5285	99·0	53	1·0	5338
Missing	200	86·2	32	13·8	232
Index of Multiple Deprivation score (quintile)					
1st Least deprived	11724	98·7	152	1·3	11876
2nd	12179	98·8	152	1·2	12331
3rd	12756	98·9	141	1·1	12897
4th	13221	99·0	131	1·0	13352
5th Most deprived	13655	99·2	104	0·8	13759
Missing	292	90·4	31	9·6	323
Previous pregnancies >=24 completed weeks					
Nulliparous	28443	99·0	288	1·0	28731
Multiparous	35289	98·8	417	1·2	35706
Missing	95	94·1	6	5·9	101
Gestation (completed weeks)					
37	1866	99·0	18	1·0	1884
38	6025	99·1	55	0·9	6080
39	15269	98·8	178	1·2	15447
40	24157	98·9	271	1·1	24428
41	15220	98·9	172	1·1	15392
42+	1117	99·0	11	1·0	1128
Missing	173	96·6	6	3·4	179

Appendix 8: Supplementary results tables

Occurrence of the components of the primary outcome by planned place of birth

The distribution of the outcomes contributing to the primary outcome is shown in Table 8. Neonatal encephalopathy and meconium aspiration syndrome were the most common events, together accounting for three quarters of the events in the composite primary outcome. Intrapartum stillbirths and early neonatal deaths accounted for 13% of the events contributing to the primary outcome. Fractured humerus and clavicle were uncommon outcomes and accounted for less than 4% of the primary outcome events.

Table 8.1: Occurrence of the components of the primary outcome

Component of primary outcome*	n	% of the primary outcome
Stillbirth	14	5·6
Early neonatal death (within 7 days)	18	7·2
Neonatal encephalopathy (clinical diagnosis)	96	38·4
Neonatal encephalopathy (signs)	18	7·2
Meconium aspiration syndrome	75	30·0
Brachial plexus injury	20	8·0
Fractured humerus	2	0·8
Fractured clavicle	7	2·8
Total	250	100

* The categories are mutually exclusive and outcomes listed higher in the table take precedence over outcomes listed lower down. For example, if a baby with neonatal encephalopathy died within 7 days the outcome is classified as an early neonatal death.

The distribution by planned place of birth is shown in Table 8.2.

Table 8.2: Components of the primary outcome for all 'low risk' women by planned place of birth

	Primary outcome events							
	OU		Home		FMU		AMU	
Component of primary outcome*	n	%	n	%	n	%	n	%
Stillbirth	3	3·7	6	8·6	4	9·8	1	1·7
Early neonatal death (within 7 days)	5	6·2	5	7·1	5	12·2	3	5·2
Neonatal encephalopathy (clinical)	32	39·5	32	45·7	16	39·0	16	27·6
Neonatal encephalopathy (signs)	8	9·9	4	5·7	2	4·9	4	6·9
Meconium aspiration syndrome	24	29·6	15	21·4	11	26·8	25	43·1
Brachial plexus injury	6	7·4	5	7·1	2	4·9	7	12·1
Fractured humerus	1	1·2	1	1·4	0	0·0	0	0·0
Fractured clavicle	2	2·5	2	2·9	1	2·4	2	3·4
Total	81	100	70	100	41	100	58	100

* The categories are mutually exclusive and outcomes listed higher in the table take precedence over outcomes listed lower down. For example, if a baby with neonatal encephalopathy died within 7 days the outcome is classified as an early neonatal death.

The distribution for the restricted sample of women without complicating conditions identified at the start of care in labour by planned place of birth is shown in Table 8.3.

Table 8.3: Components of the primary outcome for 'low risk' women without complicating conditions identified at the start of care in labour by planned place of birth

	Primary outcome events							
	OU		Home		FMU		AMU	
Component of primary outcome*	n	%	n	%	n	%	n	%
Stillbirth	3	6·3	6	9·7	3	8·6	0	0·0
Early neonatal death (within 7 days)	2	4·2	4	6·5	3	8·6	3	5·6
Neonatal encephalopathy (clinical)	20	41·7	28	45·2	15	42·9	15	27·8
Neonatal encephalopathy (signs)	7	14·6	3	4·8	2	5·7	4	7·4
Meconium aspiration syndrome	11	22·9	13	21·0	9	25·7	25	46·3
Brachial plexus injury	3	6·3	5	8·1	2	5·7	7	13·0
Fractured humerus	1	2·1	1	1·6	0	0·0	0	0·0
Fractured clavicle	1	2·1	2	3·2	1	2·9	0	0·0
Total	48	100	62	100	35	100	54	100

* The categories are mutually exclusive and outcomes listed higher in the table take precedence over outcomes listed lower down. For example, if a baby with neonatal encephalopathy died within 7 days the outcome is classified as an early neonatal death.

Secondary perinatal outcomes

Most individual perinatal outcomes were rare and because of the small number of events odds ratios were not estimated. Table 8.4 shows unadjusted, weighted event rates for all of the secondary perinatal outcomes and adjusted odds ratios for the three more commonly occurring perinatal outcomes: neonatal unit admission, Apgar <7 at 5 minutes and not breastfed. As specified in the protocol, odds ratios are presented with 99% confidence intervals for secondary outcomes.

Table 8.4: Perinatal outcomes for babies of all 'low risk' women by planned place of birth

	Events	Births	Incidence*	
	n	n	n/1000	(99% CI)
Stillbirth				
OU	3	19706	0·2	(0·0-0·7)
Home	6	16839	0·3	(0·1-1·0)
FMU	4	11282	0·4	(0·1-2·2)
AMU	1	16708	0·1	(0·0-0·8)
Total	14	64535	0·2	(0·1-0·5)
Early neonatal death (within 7 days)				
OU	5	19637	0·3	(0·1-0·8)
Home	5	16759	0·3	(0·1-1·0)
FMU	5	11263	0·4	(0·1-1·3)
AMU	3	16633	0·1	(0·0-0·7)
Total	18	64292	0·3	(0·1-0·6)
Neonatal encephalopathy (clinical or signs)				
OU	42	19587	2·3	(1·4-3·8)
Home	38	16589	2·1	(1·4-3·4)
FMU	19	11210	1·7	(0·9-3·2)
AMU	21	16569	1·6	(0·7-3·7)
Total	120	63955	2·2	(1·4-3·5)
Neonatal encephalopathy (clinical diagnosis)				
OU	34	19587	1·9	(1·1-3·3)
Home	34	16589	1·8	(1·2-2·9)
FMU	17	11210	1·5	(0·8-3·0)
AMU	17	16569	1·4	(0·6-3·6)
Total	102	63955	1·9	(1·2-3·0)
Neonatal encephalopathy (signs)				
OU	8	19706	0·4	(0·2-0·9)
Home	4	16840	0·3	(0·1-1·6)
FMU	2	11282	0·2	(0·0-1·1)
AMU	4	16710	0·2	(0·1-0·9)
Total	18	64538	0·3	(0·2-0·7)
Meconium aspiration syndrome				
OU	28	19587	1·5	(0·8-2·7)
Home	21	16589	1·3	(0·6-2·7)
FMU	12	11210	0·9	(0·4-2·0)
AMU	25	16569	1·3	(0·7-2·7)
Total	86	63955	1·4	(0·9-2·4)
Brachial plexus injury				
OU	8	19587	0·4	(0·2-1·2)
Home	6	16589	0·3	(0·1-1·0)
FMU	2	11210	0·1	(0·0-0·9)
AMU	8	16569	0·4	(0·2-1·0)
Total	24	63955	0·4	(0·2-1·0)
Fractured humerus				
OU	2	19587	0·1	(0·0-0·5)
Home	1	16589	0·0	(0·0-0·7)
FMU	0	11210	-	(-)
AMU	0	16569	-	(-)
Total	3	63955	0·1	(0·0-0·4)
Fractured clavicle				
OU	2	19587	0·1	(0·0-0·6)
Home	2	16589	0·1	(0·0-0·9)
FMU	2	11210	0·2	(0·0-2·0)
AMU	2	16569	0·1	(0·0-0·4)
Total	8	63955	0·1	(0·0-0·5)

* Weighted to reflect each unit's duration of participation, the sampling of obstetric units and to take the clustered nature of the data into account.

Table 8.4 (continued): Perinatal outcomes for babies of all 'low risk' women by planned place of birth

	Events	Births	Incidence*		Unadjusted*		Unadjusted*, †		Adjusted*, ‡	
	n	n	n/1000	(99% CI)	OR	(99% CI)	OR	(99% CI)	OR	(99% CI)
Fractured skull										
OU	0	19587	-	(-)						
Home	0	16589	-	(-)						
FMU	2	11210	0·2	(0·0-1·4)						
AMU	0	16569	-	(-)						
Total	2	63955	0·0	(0·0-0·1)						
Cephalhaematoma										
OU	22	19587	1·1	(0·7-1·8)						
Home	16	16589	0·9	(0·5-1·9)						
FMU	11	11210	1·2	(0·5-3·0)						
AMU	15	16569	0·7	(0·3-1·8)						
Total	64	63955	1·0	(0·7-1·6)						
Cerebral haemorrhage										
OU	1	19587	0·1	(0·0-0·7)						
Home	4	16589	0·2	(0·1-0·8)						
FMU	4	11210	0·3	(0·1-1·3)						
AMU	3	16569	0·1	(0·0-0·6)						
Total	12	63955	0·1	(0·0-0·4)						
Sepsis (early onset and culture positive)										
OU	8	19584	0·4	(0·2-0·9)						
Home	6	16586	0·3	(0·1-0·8)						
FMU	0	11206	-	(-)						
AMU	5	16565	0·3	(0·1-0·8)						
Total	19	63941	0·4	(0·2-0·7)						
Kernicterus (severe bilirubin encephalopathy)										
OU	0	19587	-	(-)						
Home	0	16589	-	(-)						
FMU	0	11210	-	(-)						
AMU	0	16569	-	(-)						
Total	0	63955	-	(-)						
Seizures										
OU	19	19587	1·0	(0·5-1·8)						
Home	25	16589	1·3	(0·7-2·3)						
FMU	18	11210	1·5	(0·7-3·0)						
AMU	17	16569	1·5	(0·6-3·7)						
Total	79	63955	1·1	(0·6-1·7)						
Neonatal unit admission						n=64175		n=62330		n=62330
OU	543	19642	28.3	(21.7-36.9)	1	-	1	-	1	-
Home	284	16696	17.3	(14.3-20.8)	0.60	(0.43-0.84)	0.61	(0.43-0.85)	0.73	(0.52-1.01)
FMU	194	11257	16.7	(12.3-22.6)	0.58	(0.39-0.88)	0.58	(0.38-0.87)	0.61	(0.40-0.91)
AMU	307	16580	19.8	(14.8-26.4)	0.69	(0.46-1.04)	0.70	(0.46-1.05)	0.75	(0.50-1.11)
Total	1328	64175	26.6	(21.1-33.6)						
Apgar <7 at 5 minutes						n=64365		n=62478		n=62478
OU	177	19624	9.8	(7.9-12.0)	1	-	1	-	1	-
Home	139	16803	8.4	(6.7-10.7)	0.86	(0.63-1.19)	0.88	(0.64-1.22)	0.94	(0.64-1.36)
FMU	92	11264	7.5	(5.4-10.4)	0.76	(0.52-1.13)	0.78	(0.52-1.15)	0.83	(0.55-1.25)
AMU	122	16674	8.8	(5.7-13.5)	0.90	(0.56-1.45)	0.94	(0.58-1.53)	0.96	(0.59-1.56)
Total	530	64365	9.5	(8.0-11.4)						
Not breastfed			**n/100[1]**	**(99% CI)[1]**		n=63946		n=62088		n=62088
OU	5251	19607	25.6	(20.6-31.3)	1	-	1	-	1	-
Home	1934	16584	11.5	(10.0-13.3)	0.38	(0.27-0.52)	0.38	(0.27-0.52)	0.33	(0.26-0.42)
FMU	2133	11191	19.1	(14.6-24.6)	0.69	(0.45-1.06)	0.69	(0.45-1.06)	0.63	(0.46-0.87)
AMU	3373	16564	18.8	(12.2-27.7)	0.67	(0.38-1.20)	0.68	(0.38-1.21)	0.67	(0.43-1.04)
Total	12691	63946	24.1	(19.9-28.9)						

* Weighted to reflect each unit's duration of participation, the sampling of obstetric units and to take the clustered nature of the data into account.

† Restricted to women included in the adjusted analysis.

‡ Adjusted for maternal age, ethnic group, understanding of English, marital/partner status, body mass index, Index of Multiple Deprivation score quintile, previous pregnancies >=24 completed weeks, and gestation (completed weeks).

Secondary perinatal outcomes for 'low risk' women by planned place of birth and parity

The number of events and weighted incidence of each secondary perinatal outcome for 'low risk' women is shown by planned place of birth and parity in table 8.5. Odds ratios were calculated for the three more commonly occurring perinatal outcomes: neonatal unit admission, Apgar <7 at 5 minutes and not breastfed.

Table 8.5: Perinatal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*	
	n	n	n/1000	(99% CI)
Stillbirth				
Nulliparous women				
OU	1	10626	0·1	(0·0-1·5)
Home	4	4568	0·9	(0·2-3·3)
FMU	1	5187	0·3	(0·0-3·5)
AMU	1	8349	0·1	(0·0-1·6)
Total	7	28730	0·1	(0·0-0·9)
Multiparous women				
OU	2	9049	0·2	(0·0-1·2)
Home	2	12255	0·1	(0·0-0·9)
FMU	3	6078	0·5	(0·1-2·2)
AMU	0	8322	-	(-)
Total	7	35704	0·2	(0·0-0·9)
Early neonatal death (within 7 days)				
Nulliparous women				
OU	4	10593	0·4	(0·1-1·3)
Home	2	4544	0·4	(0·1-2·4)
FMU	3	5180	0·5	(0·1-1·7)
AMU	2	8304	0·1	(0·0-1·7)
Total	11	28621	0·4	(0·1-1·1)
Multiparous women				
OU	1	9013	0·1	(0·0-1·8)
Home	3	12199	0·3	(0·1-1·3)
FMU	2	6066	0·3	(0·1-2·2)
AMU	1	8293	0·1	(0·0-1·4)
Total	7	35571	0·2	(0·0-1·0)
Neonatal encephalopathy (clinical or signs)				
Nulliparous women				
OU	27	10560	2·8	(1·5-5·2)
Home	22	4500	4·8	(2·7-8·6)
FMU	13	5163	2·5	(1·1-5·6)
AMU	17	8282	2·9	(1·2-6·9)
Total	79	28505	2·8	(1·6-4·8)
Multiparous women				
OU	15	8997	1·8	(0·8-3·7)
Home	16	12074	1·2	(0·6-2·2)
FMU	6	6031	1·1	(0·4-2·9)
AMU	4	8252	0·4	(0·1-1·4)
Total	41	35354	1·6	(0·8-3·1)

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.

Table 8.5 (continued): Perinatal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*	
	n	n	n/1000	(99% CI)
Neonatal encephalopathy (clinical diagnosis)				
Nulliparous women				
OU	20	10560	2·2	(1·1-4·2)
Home	19	4500	3·8	(2·1-6·9)
FMU	12	5163	2·3	(0·9-5·5)
AMU	14	8282	2·5	(0·9-6·9)
Total	65	28505	2·2	(1·3-3·9)
Multiparous women				
OU	14	8997	1·7	(0·8-3·6)
Home	15	12074	1·1	(0·6-2·2)
FMU	5	6031	0·9	(0·3-2·8)
AMU	3	8252	0·3	(0·1-1·4)
Total	37	35354	1·5	(0·7-3·0)
Neonatal encephalopathy (signs)				
Nulliparous women				
OU	7	10626	0·6	(0·2-1·6)
Home	3	4568	1·0	(0·1-6·3)
FMU	1	5187	0·2	(0·0-2·5)
AMU	3	8350	0·3	(0·1-1·5)
Total	14	28731	0·6	(0·2-1·4)
Multiparous women				
OU	1	9049	0·1	(0·0-1·0)
Home	1	12256	0·0	(0·0-0·6)
FMU	1	6078	0·2	(0·0-2·1)
AMU	1	8323	0·1	(0·0-1·1)
Total	4	35706	0·1	(0·0-0·6)
Meconium aspiration syndrome				
Nulliparous women				
OU	16	10560	1·6	(0·7-3·5)
Home	13	4500	3·3	(1·3-8·6)
FMU	6	5163	1·1	(0·3-3·9)
AMU	14	8282	1·1	(0·5-2·7)
Total	49	28505	1·6	(0·8-3·1)
Multiparous women				
OU	12	8997	1·4	(0·6-3·2)
Home	8	12074	0·6	(0·2-1·4)
FMU	6	6031	0·7	(0·2-2·1)
AMU	11	8252	1·5	(0·6-4·2)
Total	37	35354	1·3	(0·6-2·7)
Brachial plexus injury				
Nulliparous women				
OU	8	10560	0·8	(0·3-2·3)
Home	3	4500	0·6	(0·1-3·8)
FMU	1	5163	0·2	(0·0-1·9)
AMU	5	8282	0·5	(0·1-1·8)
Total	17	28505	0·8	(0·3-2·0)
Multiparous women				
OU	0	8997	-	(-)
Home	3	12074	0·2	(0·0-0·9)
FMU	1	6031	0·1	(0·0-1·9)
AMU	3	8252	0·3	(0·1-1·4)
Total	7	35354	0·0	(0·0-0·2)

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.

Table 8.5 (continued): Perinatal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*	
	n	n	n/1000	(99% CI)
Fractured humerus				
Nulliparous women				
OU	0	10560	-	(-)
Home	0	4500	-	(-)
FMU	0	5163	-	(-)
AMU	0	8282	-	(-)
Total	0	28505	-	(-)
Multiparous women				
OU	2	8997	0·2	(0·0-1·1)
Home	1	12074	0·1	(0·0-0·9)
FMU	0	6031	-	(-)
AMU	0	8252	-	(-)
Total	3	35354	0·2	(0·0-0·9)
Fractured clavicle				
Nulliparous women				
OU	1	10560	0·1	(0·0-1·5)
Home	1	4500	0·2	(0·0-3·1)
FMU	1	5163	0·1	(0·0-1·4)
AMU	1	8282	0·1	(0·0-0·8)
Total	4	28505	0·1	(0·0-1·0)
Multiparous women				
OU	1	8997	0·1	(0·0-1·2)
Home	1	12074	0·1	(0·0-1·5)
FMU	1	6031	0·4	(0·0-4·6)
AMU	1	8252	0·1	(0·0-0·9)
Total	4	35354	0·1	(0·0-0·7)
Fractured skull				
Nulliparous women				
OU	0	10560	-	(-)
Home	0	4500	-	(-)
FMU	1	5163	0·3	(0-4·2)
AMU	0	8282	-	(-)
Total	1	28505	0·0	(0-0·1)
Multiparous women				
OU	0	8997	-	(-)
Home	0	12074	-	(-)
FMU	1	6031	0·1	(0-1·7)
AMU	0	8252	-	(-)
Total	1	35354	0·0	(0-0·1)
Cephalhaematoma				
Nulliparous women				
OU	20	10560	1·8	(1·1-3·0)
Home	9	4500	2·0	(0·7-5·4)
FMU	7	5163	1·5	(0·4-4·9)
AMU	15	8282	1·4	(0·6-3·5)
Total	51	28505	1·8	(1·2-2·7)
Multiparous women				
OU	2	8997	0·2	(0·0-1·0)
Home	7	12074	0·5	(0·2-1·4)
FMU	4	6031	1·1	(0·3-4·0)
AMU	0	8252	-	(-)
Total	13	35354	0·2	(0·1-0·7)

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.

Table 8.5 (continued): Perinatal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*	
	n	n	n/1000	(99% CI)
Cerebral haemorrhage				
Nulliparous women				
OU	1	10560	0·1	(0·0-1·3)
Home	1	4500	0·2	(0·0-2·0)
FMU	2	5163	0·2	(0-1·4)
AMU	2	8282	0·1	(0-0·9)
Total	6	28505	0·1	(0-0·9)
Multiparous women				
OU	0	8997	-	(-)
Home	3	12074	0·2	(0·1-1·1)
FMU	2	6031	0·3	(0·0-3·6)
AMU	1	8252	0·1	(0·0-1·7)
Total	6	35354	0·0	(0·0-0·2)
Sepsis (early onset and culture positive)				
Nulliparous women				
OU	6	10557	0·5	(0·2-1·4)
Home	4	4499	0·6	(0·1-2·6)
FMU	0	5160	-	(-)
AMU	5	8279	0·5	(0·2-1·6)
Total	15	28495	0·5	(0·2-1·2)
Multiparous women				
OU	2	8997	0·3	(0·0-1·5)
Home	2	12072	0·1	(0·0-0·9)
FMU	0	6030	-	(-)
AMU	0	8251	-	(-)
Total	4	35350	0·2	(0·0-1·2)
Kernicterus (severe billirubin encephalopathy)				
Nulliparous women				
OU	0	10560	-	(-)
Home	0	4500	-	(-)
FMU	0	5163	-	(-)
AMU	0	8282	-	(-)
Total	0	28505	-	(-)
Multiparous women				
OU	0	8997	-	(-)
Home	0	12074	-	(-)
FMU	0	6031	-	(-)
AMU	0	8252	-	(-)
Total	0	35354	-	(-)
Seizures				
Nulliparous women				
OU	9	10560	0·8	(0·4-1·8)
Home	15	4500	2·7	(1·4-5·3)
FMU	13	5163	2·4	(1·0-5·6)
AMU	10	8282	2·1	(0·7-6·9)
Total	47	28505	1·0	(0·5-1·9)
Multiparous women				
OU	10	8997	1·2	(0·5-2·9)
Home	10	12074	0·7	(0·3-1·8)
FMU	5	6031	0·7	(0·2-2·5)
AMU	7	8252	0·8	(0·2-2·6)
Total	32	35354	1·1	(0·5-2·4)

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.

Table 8.5 (continued): Perinatal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*		Unadjusted*, †		Adjusted*, ‡	
	n	n	n/1000	(99% CI)	OR	(99% CI)	OR	(99% CI)
Neonatal unit admission						n=61848		n=61848
Nulliparous women								
OU	372	10597	36·1	(27·0-48·0)				
Home	127	4535	28·5	(22·2-36·5)	0·81	(0·54-1·20)	0·79	(0·54-1·17)
FMU	120	5181	21·6	(15·2-30·7)	0·59	(0·37-0·95)	0·59	(0·37-0·94)
AMU	198	8281	26·0	(19·3-35·0)	0·72	(0·46-1·12)	0·76	(0·49-1·17)
Total	817	28594	34·5	(26·7-44·6)				
Multiparous women								
OU	171	9015	19·2	(14·5-25·3)				
Home	157	12145	13·1	(10·3-16·6)	0·68	(0·47-0·99)	0·67	(0·46-0·98)
FMU	73	6060	12·2	(8·1-18·5)	0·64	(0·38-1·06)	0·64	(0·38-1·06)
AMU	109	8262	13·6	(9·4-19·5)	0·70	(0·45-1·10)	0·74	(0·48-1·15)
Total	510	35482	18·0	(14·1-22·8)				
Apgar <7 at 5 minutes						n=61900		n=61900
Nulliparous women								
OU	101	10578	10·1	(7·8-13·0)				
Home	65	4552	14·3	(10·0-20·4)	1·45	(0·92-2·29)	1·43	(0·90-2·28)
FMU	56	5180	9·3	(6·6-13·2)	0·98	(0·63-1·52)	1·04	(0·67-1·62)
AMU	83	8330	11·9	(7·5-18·8)	1·26	(0·73-2·16)	1·29	(0·75-2·22)
Total	305	28640	10·3	(8·3-12·9)				
Multiparous women								
OU	76	9017	9·4	(6·8-13·0)				
Home	74	12235	6·3	(4·5-8·7)	0·69	(0·44-1·09)	0·70	(0·43-1·12)
FMU	35	6067	5·6	(3·1-10·0)	0·61	(0·31-1·18)	0·63	(0·32-1·25)
AMU	39	8307	5·7	(3·3-9·9)	0·60	(0·31-1·16)	0·61	(0·32-1·18)
Total	224	35626	8·7	(6·5-11·6)				
Not breastfed			**%**			n=61566		n=61566
Nulliparous women								
OU	2530	10577	22·7	(17·8-28·3)				
Home	272	4510	6·0	(4·8-7·5)	0·22	(0·15-0·32)	0·28	(0·21-0·39)
FMU	830	5148	16·0	(11·9-21·1)	0·65	(0·41-1·02)	0·61	(0·43-0·86)
AMU	1470	8269	16·3	(10·1-25·2)	0·67	(0·36-1·25)	0·66	(0·41-1·05)
Total	5102	28504	21·5	(17·4-26·4)				
Multiparous women								
OU	2707	8999	29·0	(23·7-34·9)				
Home	1660	12058	13·6	(11·9-15·4)	0·38	(0·28-0·52)	0·37	(0·29-0·48)
FMU	1300	6026	21·8	(16·7-27·8)	0·69	(0·45-1·05)	0·66	(0·48-0·91)
AMU	1896	8258	21·4	(14·5-30·5)	0·68	(0·39-1·18)	0·66	(0·43-1·02)
Total	7563	35341	27·0	(22·7-31·9)				

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.
† Restricted to women included in the adjusted analysis (who were not missing any potential confounder data).
‡ Adjusted for maternal age, ethnic group, understanding of English, marital/partner status, body mass index, Index of Multiple Deprivation score quintile, previous pregnancies >=24 weeks, and gestation (completed weeks).

Secondary maternal outcomes for 'low risk' women by planned place of birth and parity

The number of events and weighted incidence of each secondary maternal outcome for 'low risk' women is shown by planned place of birth and parity in table 8.6. Unadjusted and adjusted odds ratios were also calculated by parity, using the obstetric unit group as the reference for all comparisons.

Table 8.6: Maternal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*		Unadjusted*, †		Adjusted*, ‡	
	n	n	%	(99% CI)	OR	(99% CI)	OR	(99% CI)
Spontaneous vertex birth						n=62000		n=62000
Nulliparous women								
OU	6589	10617	61·3	(57·8-64·7)				
Home	3577	4565	78·6	(76·3-80·8)	2·28	(1·87-2·77)	2·77	(2·25-3·41)
FMU	4201	5186	82·3	(79·1-85·0)	2·92	(2·27-3·75)	2·97	(2·32-3·79)
AMU	6357	8336	75·8	(72·5-78·9)	1·97	(1·57-2·47)	1·99	(1·57-2·52)
Total	20724	28704	63·7	(60·4-66·8)				
Multiparous women								
OU	8030	9041	88·7	(86·6-90·4)				
Home	11998	12244	98·0	(97·7-98·4)	6·36	(4·87-8·30)	6·85	(5·23-8·96)
FMU	5937	6078	97·8	(97·1-98·3)	5·46	(3·88-7·69)	5·65	(3·98-8·01)
AMU	8025	8317	96·3	(95·2-97·2)	3·33	(2·36-4·70)	3·33	(2·35-4·71)
Total	33990	35680	90·4	(88·6-91·9)				
Vaginal breech birth						n=62000		n=62000
Nulliparous women								
OU	18	10617	0·2	(0·1-0·3)				
Home	13	4565	0·3	(0·1-0·5)	1·64	(0·58-4·66)	2·15	(0·77-6·02)
FMU	15	5186	0·3	(0·1-0·6)	1·72	(0·59-4·96)	1·91	(0·67-5·40)
AMU	15	8336	0·2	(0·1-0·4)	1·10	(0·39-3·11)	1·10	(0·41-2·98)
Total	61	28704	0·2	(0·1-0·3)				
Multiparous women								
OU	25	9041	0·3	(0·2-0·5)				
Home	50	12244	0·4	(0·3-0·6)	1·61	(0·78-3·31)	2·02	(0·98-4·16)
FMU	24	6078	0·4	(0·2-0·8)	1·74	(0·75-4·03)	2·03	(0·90-4·59)
AMU	11	8317	0·2	(0·1-0·4)	0·72	(0·26-2·01)	0·74	(0·27-2·05)
Total	110	35680	0·3	(0·2-0·4)				
Ventouse delivery						n=62000		n=62000
Nulliparous women								
OU	1204	10617	11·8	(9·4-14·7)				
Home	282	4565	5·9	(4·9-7·2)	0·49	(0·35-0·67)	0·40	(0·29-0·56)
FMU	295	5186	5·3	(3·9-7·2)	0·43	(0·29-0·65)	0·41	(0·28-0·60)
AMU	654	8336	8·1	(6·2-10·6)	0·66	(0·45-0·97)	0·63	(0·44-0·92)
Total	2435	28704	11·1	(9·0-13·6)				
Multiparous women								
OU	330	9041	3·7	(2·8-4·9)				
Home	60	12244	0·5	(0·3-0·7)	0·14	(0·08-0·22)	0·12	(0·07-0·20)
FMU	25	6078	0·4	(0·2-0·7)	0·10	(0·05-0·21)	0·09	(0·04-0·20)
AMU	101	8317	1·3	(0·9-2·0)	0·36	(0·22-0·60)	0·35	(0·21-0·58)
Total	516	35680	3·1	(2·4-4·1)				

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.
† Restricted to women included in the adjusted analysis (who were not missing any potential confounder data).
‡ Adjusted for maternal age, ethnic group, understanding of English, marital/partner status, body mass index, Index of Multiple Deprivation score quintile, previous pregnancies >=24 weeks, and gestation (completed weeks).

Table 8.6 (continued): Maternal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*		Unadjusted*, †		Adjusted*, ‡	
	n	n	%	(99% CI)	OR	(99% CI)	OR	(99% CI)
Forceps delivery						n=62000		n=62000
Nulliparous women								
OU	1125	10617	10·7	(8·6-13·2)				
Home	318	4565	6·6	(5·6-7·8)	0·60	(0·45-0·81)	0·53	(0·39-0·72)
FMU	318	5186	5·4	(4·2-7·1)	0·49	(0·34-0·70)	0·48	(0·33-0·69)
AMU	673	8336	8·2	(6·1-10·9)	0·74	(0·50-1·10)	0·74	(0·49-1·10)
Total	2434	28704	10·2	(8·4-12·4)				
Multiparous women								
OU	182	9041	2·1	(1·5-2·9)				
Home	53	12244	0·4	(0·3-0·6)	0·20	(0·12-0·33)	0·18	(0·11-0·31)
FMU	46	6078	0·7	(0·5-1·1)	0·34	(0·20-0·59)	0·33	(0·19-0·56)
AMU	92	8317	1·1	(0·7-2·0)	0·55	(0·29-1·05)	0·55	(0·29-1·04)
Total	373	35680	1·8	(1·4-2·5)				
Intrapartum caesarean section						n=62000		n=62000
Nulliparous women								
OU	1681	10617	16·0	(13·9-18·4)				
Home	375	4565	8·5	(7·0-10·4)	0·49	(0·37-0·65)	0·45	(0·34-0·59)
FMU	357	5186	6·7	(5·5-8·1)	0·37	(0·28-0·48)	0·39	(0·30-0·50)
AMU	637	8336	7·7	(6·3-9·3)	0·45	(0·34-0·58)	0·47	(0·35-0·62)
Total	3050	28704	14·8	(12·9-16·9)				
Multiparous women								
OU	474	9041	5·3	(4·1-6·9)				
Home	83	12244	0·6	(0·5-0·9)	0·11	(0·07-0·17)	0·11	(0·07-0·17)
FMU	46	6078	0·7	(0·5-1·1)	0·13	(0·08-0·23)	0·14	(0·08-0·23)
AMU	88	8317	1·0	(0·7-1·5)	0·18	(0·11-0·30)	0·19	(0·11-0·32)
Total	691	35680	4·4	(3·4-5·7)				
Third or fourth degree perineal trauma						n=61902		n=61902
Nulliparous women								
OU	480	10585	4·5	(3·8-5·3)				
Home	195	4555	4·3	(3·5-5·3)	0·93	(0·69-1·25)	0·86	(0·62-1·19)
FMU	206	5177	4·0	(3·1-5·1)	0·89	(0·66-1·21)	0·89	(0·64-1·24)
AMU	405	8322	4·9	(4·0-6·0)	1·08	(0·82-1·44)	1·08	(0·81-1·45)
Total	1286	28639	4·5	(3·9-5·2)				
Multiparous women								
OU	145	9025	1·6	(1·2-2·1)				
Home	123	12229	1·0	(0·7-1·3)	0·64	(0·42-0·96)	0·63	(0·40-0·99)
FMU	52	6068	0·9	(0·6-1·4)	0·57	(0·34-0·95)	0·56	(0·33-0·95)
AMU	129	8295	1·6	(1·2-2·1)	0·94	(0·61-1·44)	0·93	(0·61-1·41)
Total	449	35617	1·6	(1·2-2·0)				
Blood transfusion						n=61734		n=61734
Nulliparous women								
OU	174	10564	1·6	(1·3-2·1)				
Home	55	4540	1·3	(0·9-2·1)	0·87	(0·52-1·45)	0·93	(0·54-1·58)
FMU	42	5173	0·8	(0·5-1·1)	0·48	(0·31-0·76)	0·52	(0·33-0·82)
AMU	93	8262	1·3	(0·9-1·7)	0·74	(0·49-1·11)	0·75	(0·51-1·10)
Total	364	28539	1·6	(1·3-2·0)				
Multiparous women								
OU	67	8984	0·7	(0·5-1·1)				
Home	46	12131	0·4	(0·3-0·6)	0·48	(0·28-0·81)	0·51	(0·29-0·89)
FMU	25	6040	0·3	(0·2-0·6)	0·39	(0·19-0·81)	0·42	(0·20-0·87)
AMU	43	8250	0·6	(0·4-0·8)	0·74	(0·44-1·27)	0·74	(0·44-1·26)
Total	181	35405	0·7	(0·5-0·9)				

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.
† Restricted to women included in the adjusted analysis (who were not missing any potential confounder data).
‡ Adjusted for maternal age, ethnic group, understanding of English, marital/partner status, body mass index, Index of Multiple Deprivation score quintile, previous pregnancies >=24 weeks, and gestation (completed weeks).

Table 8.6 (continued): Maternal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*		Unadjusted*,†		Adjusted*,‡	
	n	n	%	(99% CI)	OR	(99% CI)	OR	(99% CI)
Admission to a higher level of care						n=62036		n=62036
Nulliparous women								
OU	83	10626	0·8	(0·4-1·6)				
Home	26	4568	0·6	(0·3-1·2)	0·67	(0·27-1·69)	0·66	(0·26-1·66)
FMU	15	5187	0·2	(0·1-0·5)	0·31	(0·11-0·86)	0·35	(0·13-0·96)
AMU	51	8350	1·0	(0·4-2·8)	1·23	(0·35-4·35)	1·24	(0·37-4·17)
Total	175	28731	0·8	(0·5-1·4)				
Multiparous women								
OU	34	9049	0·4	(0·2-0·7)				
Home	32	12256	0·3	(0·2-0·5)	0·75	(0·32-1·73)	0·78	(0·32-1·92)
FMU	9	6078	0·1	(0·0-0·3)	0·26	(0·06-1·05)	0·28	(0·07-1·22)
AMU	31	8323	0·4	(0·2-0·7)	0·95	(0·41-2·19)	0·95	(0·42-2·17)
Total	106	35706	0·4	(0·2-0·6)				
Syntocinon augmentation						n=61738		n=61738
Nulliparous women								
OU	3639	10487	34·9	(31·7-38·4)				
Home	804	4542	17·1	(15·2-19·2)	0·39	(0·31-0·47)	0·35	(0·28-0·43)
FMU	778	5158	13·9	(11·8-16·3)	0·30	(0·23-0·38)	0·30	(0·23-0·38)
AMU	1507	8318	18·0	(15·9-20·3)	0·41	(0·33-0·51)	0·42	(0·34-0·52)
Total	6728	28505	32·3	(29·4-35·4)				
Multiparous women								
OU	901	8966	10·0	(8·3-12·0)				
Home	139	12236	1·1	(0·8-1·4)	0·10	(0·07-0·14)	0·10	(0·07-0·14)
FMU	96	6065	1·4	(0·9-2·1)	0·13	(0·08-0·21)	0·12	(0·08-0·20)
AMU	199	8305	2·4	(1·8-3·3)	0·22	(0·15-0·32)	0·23	(0·16-0·32)
Total	1335	35572	8·3	(6·9-10·0)				
Immersion in water for pain relief						n=61673		n=61673
Nulliparous women								
OU	1242	10613	11·4	(8·1-15·7)				
Home	2189	4455	48·8	(44·3-53·3)	7·28	(4·85-10·92)	6·21	(4·20-9·18)
FMU	2726	5178	51·9	(41·2-62·5)	8·28	(4·68-14·66)	7·65	(4·37-13·39)
AMU	3077	8337	37·1	(29·0-45·9)	4·47	(2·66-7·51)	4·55	(2·75-7·51)
Total	9234	28583	15·8	(12·4-19·9)				
Multiparous women								
OU	593	9037	6·3	(4·3-9·2)				
Home	3329	11973	27·5	(25·0-30·2)	5·48	(3·58-8·39)	4·71	(3·11-7·14)
FMU	2520	6075	40·6	(30·7-51·2)	9·82	(5·42-17·79)	8·86	(4·92-15·95)
AMU	1975	8319	23·2	(17·5-30·1)	4·35	(2·54-7·44)	4·47	(2·65-7·53)
Total	8417	35404	10·7	(8·3-13·7)				
Epidural or spinal analgesia						n=61853		n=61853
Nulliparous women								
OU	4345	10550	42·5	(38·3-46·8)				
Home	1049	4545	22·7	(20·3-25·3)	0·40	(0·32-0·50)	0·35	(0·28-0·44)
FMU	1021	5168	18·9	(16·5-21·6)	0·32	(0·25-0·41)	0·31	(0·25-0·40)
AMU	1987	8320	24·4	(21·5-27·7)	0·44	(0·35-0·56)	0·44	(0·35-0·57)
Total	8402	28583	39·6	(35·7-43·7)				
Multiparous women								
OU	1465	8998	16·8	(14·4-19·5)				
Home	369	12238	2·9	(2·5-3·5)	0·15	(0·12-0·20)	0·14	(0·11-0·18)
FMU	224	6068	3·5	(2·8-4·5)	0·18	(0·13-0·25)	0·17	(0·13-0·24)
AMU	472	8305	5·9	(4·8-7·1)	0·31	(0·23-0·41)	0·31	(0·24-0·41)
Total	2530	35609	14·3	(12·2-16·6)				

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.
† Restricted to women included in the adjusted analysis (who were not missing any potential confounder data).
‡ Adjusted for maternal age, ethnic group, understanding of English, marital/partner status, body mass index, Index of Multiple Deprivation score quintile, previous pregnancies >=24 weeks, and gestation (completed weeks).

Table 8.6 (continued): Maternal outcomes for 'low risk' women by planned place of birth and parity

	Events	Births	Incidence*		Unadjusted*, †		Adjusted*, ‡	
	n	n	%	(99% CI)	OR	(99% CI)	OR	(99% CI)
General anaesthesia						n=61610		n=61610
Nulliparous women								
OU	199	10446	1·9	(1·5-2·4)				
Home	47	4490	1·0	(0·6-1·6)	0·55	(0·33-0·95)	0·56	(0·32-0·96)
FMU	43	5162	0·9	(0·5-1·5)	0·46	(0·25-0·84)	0·48	(0·26-0·88)
AMU	73	8297	0·9	(0·6-1·5)	0·49	(0·30-0·79)	0·52	(0·32-0·84)
Total	362	28395	1·7	(1·4-2·2)				
Multiparous women								
OU	86	8948	0·9	(0·7-1·3)				
Home	30	12208	0·2	(0·1-0·4)	0·25	(0·13-0·50)	0·26	(0·13-0·50)
FMU	18	6067	0·2	(0·1-0·6)	0·26	(0·10-0·69)	0·27	(0·10-0·70)
AMU	26	8308	0·3	(0·2-0·5)	0·33	(0·18-0·60)	0·35	(0·19-0·63)
Total	160	35531	0·8	(0·6-1·1)				
No active management of the 3rd stage						n=61664		n=61664
Nulliparous women								
OU	615	10610	5·9	(4·5-7·7)				
Home	1289	4446	29·3	(25·4-33·4)	6·61	(4·66-9·37)	6·35	(4·48-9·02)
FMU	1052	5179	20·2	(14·5-27·6)	4·13	(2·50-6·81)	4·19	(2·56-6·87)
AMU	1144	8335	12·8	(9·2-17·6)	2·32	(1·45-3·72)	2·32	(1·46-3·67)
Total	4100	28570	7·5	(6·0-9·2)				
Multiparous women								
OU	572	9043	6·4	(4·7-8·7)				
Home	3799	11967	32·0	(28·2-36·1)	6·97	(4·78-10·18)	6·91	(4·69-10·17)
FMU	1515	6076	23·8	(16·8-32·5)	4·64	(2·68-8·03)	4·70	(2·72-8·15)
AMU	1416	8320	15·4	(11·1-20·9)	2·67	(1·62-4·41)	2·66	(1·62-4·38)
Total	7302	35406	9·6	(7·7-11·8)				
Episiotomy						n=61868		n=61868
Nulliparous women								
OU	3087	10606	29·3	(26·6-32·1)				
Home	756	4518	16·0	(14·5-17·6)	0·47	(0·39-0·56)	0·41	(0·34-0·50)
FMU	855	5183	16·0	(13·3-19·1)	0·46	(0·36-0·60)	0·45	(0·35-0·57)
AMU	1804	8337	22·1	(19·3-25·2)	0·68	(0·55-0·85)	0·67	(0·53-0·84)
Total	6502	28644	27·9	(25·5-30·4)				
Multiparous women								
OU	689	9042	7·5	(6·4-8·9)				
Home	176	12137	1·5	(1·2-1·8)	0·19	(0·14-0·26)	0·18	(0·14-0·24)
FMU	137	6076	2·3	(1·8-3·0)	0·29	(0·21-0·41)	0·28	(0·20-0·39)
AMU	287	8315	3·7	(3·0-4·6)	0·48	(0·36-0·65)	0·47	(0·35-0·64)
Total	1289	35570	6·6	(5·6-7·7)				

* Weighted to reflect each unit's duration of participation and probability of being sampled; confidence intervals take account of the clustered nature of the data.
† Restricted to women included in the adjusted analysis (who were not missing any potential confounder data).
‡ Adjusted for maternal age, ethnic group, understanding of English, marital/partner status, body mass index, Index of Multiple Deprivation score quintile, previous pregnancies >=24 weeks, and gestation (completed weeks).

Appendix 9: The Birthplace in England Collaborative Group

The Birthplace in England Collaborative Group includes the wider group of co-investigators, advisors, researchers, project staff and coordinating midwives who contributed to the research programme.

Co-investigators
Professor Peter Brocklehurst, Professor of Perinatal Epidemiology, NPEU, University of Oxford
Professor Alison Macfarlane, Professor of Perinatal Health, City University London
Professor Neil Marlow, Professor of Neonatal Medicine, University College London
Professor Rona McCandlish, Midwifery Professional Advisor, Chief Nursing Officer's Professional Leadership Team, Department of Health (on secondment from NPEU from February 2009)
Professor Christine McCourt, Professor of Maternal and Child Health, City University London
Alison Miller, Programme Director and Midwifery Lead, CMACE
Mary Newburn, Head of Research and Information, NCT
Professor Stavros Petrou, Professor of Health Economics, University of Warwick
Dr Maggie Redshaw, Social Scientist, NPEU, University of Oxford
Professor Jane Sandall, Professor of Women's Health and Programme Director (Innovations), NIHR King's Patient Safety and Service Quality Research Centre, King's College, London
Louise Silverton, Deputy General Secretary, Royal College of Midwives

Birthplace Advisory group
Professor Cathy Warwick (Chair, 2007-2008), King's College Hospital Foundation Trust
Kate Sallah (Chair, 2008-2011), Tashie Consulting
Jill Demilew (Deputy Chair), Consultant Midwife, Kings College Hospital Foundation Trust
Professor Maggie Blott, Vice President, Royal College of Obstetricians and Gynaecologists
Professor David Richmond, Vice President, Royal College of Obstetricians and Gynaecologists
Sue Eardley, Children and Maternity Strategy and Safeguarding Care Quality Commission
Professor Naomi Fulop, School of Social Science and Public Policy, King's College, London
Dr Gary Hartnoll, Consultant Neonatologist, Chelsea and Westminster Hospital
Dr Sara Kenyon, Senior Lecturer, School of Health and Population Studies, University of Birmingham
Professor Gwyneth Lewis, National Clinical Lead for Maternal Health and Maternity Services, Department of Health, and Director of the Maternal Deaths Enquiry, CMACE
Mandy Forrester, Midwifery Advisor, Nursing and Midwifery Council
Christina McKenzie, Head of Midwifery, Nursing and Midwifery Council
Maddie McMahon, Cambridge Maternity Services Liaison Committee
Sue Allen-Mills, Cambridge Maternity Services Liaison Committee
Gail McConnell, former Chair of the Barnet, Enfield and Haringey Maternity Services Liaison Committee
Jane Walker, Consultant Midwife, Homerton University Hospital NHS Foundation Trust

Researchers
Dr Jennifer Hollowell, Epidemiologist, NPEU, University of Oxford
Nishma Patel, Health Economist, NPEU, University of Oxford
David Puddicombe, Researcher/Epidemiologist, NPEU, University of Oxford
Dr Susanna Rance, Researcher, King's College, London
Dr Juliet Rayment, Researcher, City University
Rachel Rowe, Researcher and NIHR Researcher Development Award Holder, NPEU, University of Oxford
Liz Schroeder, Health Economist, NPEU, University of Oxford
Dr Mary Stewart, National Lead Research Midwife, NPEU, University of Oxford

Statisticians (prospective cohort study)
Pollyanna Hardy, Senior Trials Statistician, NPEU, University of Oxford
Louise Linsell, Senior Medical Statistician, NPEU, University of Oxford

NPEU project team
Elizabeth Bosiak, NPEU, Data Coordinator
Magdalena Gallagher, Data Manager, NPEU, University of Oxford
Dr Bob Gatton, Programmer, NPEU, University of Oxford
Mary Logan, Project Manager, NPEU, University of Oxford
Virginia Roncaglione, NPEU, Data Coordinator

Regional Lead Midwives (prospective cohort study)
Kate Brintworth (London)
Chelsea McDonough (North)
Catherine Melvin (North)
Carol Puckett (South West)
Laura Stewart-Maunder (South East and Central)
Catherine Walton (London)

Local Coordinating Midwives (prospective cohort study)
Deborah Tunney, Amanda Wright (Airedale NHS Trust); Liz Cox, Emer Kelly, Julia Lidderdale,(Ashford and St Peters Hospitals NHS Trust); Margo Sherman (Barking, Havering And Redbridge Hospitals NHS Trust); Denise Cohen, Ann Fowler, Connie Froetschner, Cathy Rogers (Barnet and Chase Farm Hospitals NHS Trust); Sandra Newman, Janice Taylor, Claire Turner (Barnsley Hospital NHS Foundation Trust); Miriam Martin, Penny McVey (Barts And The London NHS Trust); Nhlanhla Mguni (Basildon And Thurrock University Hospitals NHS Foundation Trust); Nicola Brown (Basingstoke and North Hampshire NHS Foundation Trust); Rebecca Daniels (Bedford Hospital NHS Trust); Louise Wilde (Birmingham Women's Health Care NHS Trust); Ian Kemp (Blackpool, Fylde And Wyre Hospitals NHS Trust); Jayne Mulligan, Annabel Nicholas (Bolton Hospital NHS Trust); Becky Airey, Diane Farrar (Bradford Teaching Hospitals NHS Foundation Trust); Maureen Quin (Brighton And Sussex University Hospitals NHS Trust); Tracey Payne (Buckinghamshire Hospitals NHS Trust); Denise Austin, Jo Baxter (Burton Hospitals NHS Trust); Kath Kershaw, Rachel Newport, Sue Townend (Calderdale and Huddersfield NHS Foundation Trust); Jane Ford (Cambridge University Hospitals NHS Foundation Trust); Susan Woods (Central Manchester and Manchester Children's University Hospitals NHS Trust); Linda Gustard (Chesterfield Royal Hospital NHS Foundation Trust); Amanda Bargh, Eileen Walton (City Hospitals Sunderland NHS Foundation Trust); Sue Armstrong (Colchester Hospitals University NHS Foundation Trust); Di Langhorn (Countess Of Chester Hospital NHS Foundation Trust); Sandra Bohill, Beverley Corner, Jackie Hendy, Jackie Hogg, Barbara Payne (County Durham and Darlington NHS Foundation Trust); Sara Carcary, Trish Hamblin, Sandra Matthews (Dartford And Gravesham NHS Trust); Sharon Wallis (Derby Hospitals NHS Foundation Trust); Marel McDonald, Cathy Shaw (Doncaster And Bassetlaw Hospitals NHS Foundation Trust); Andrea Batty, Gill Cheadle (Dudley Group Of Hospitals NHS Trust); Grace Lee, Sarah Moffat (Ealing Hospital NHS Trust); Bev Clark, Gillian Locke (East And North Hertfordshire NHS Trust); Louise Yusuf (East Cheshire NHS Trust); Niloufar Hajilou, Melissa Howard (East Kent Hospitals NHS Trust); Cathie Melvin (East Lancashire Hospitals NHS Trust); Rebecca Beedell, Debbie Gowers, Francis Moffat, Alison Newby, Nicky Smith, Natalie Wolfe (East Sussex Hospitals NHS Trust); Andrea Cox, Maria Mills Shaw, Sara Wright (Epsom and St Helier University Hospitals NHS Trust); Jaime Sutherland (Frimley Park Hospital NHS Foundation Trust); Amanda Brown (Gateshead Health NHS Foundation Trust); Karen Davies, Linda Edwards, Annette Harbour (George Eliot Hospital NHS Trust); Sally Unwin (Gloucestershire Hospitals NHS Foundation Trust); Michelle Poole (Gloucestershire PCT); Saliane Campbell, Jan Powell (Guy's and St Thomas' NHS Foundation Trust); Nicola Bellerby (Harrogate and District NHS Foundation Trust); Elaine Gahir (Heart of England NHS Foundation Trust); Frances Burt, Ros McDonnell

(Heatherwood And Wexham Park Hospitals NHS Trust); Dawn Morris, Kay Pritchard (Hereford Hospitals NHS Trust); Jane Blyth (Hillingdon Hospital NHS Trust (The)); Lesley Alexander (Hinchingbrooke Health Care NHS Trust); Audrey Crawford (Homerton University Hospital NHS Foundation Trust); Abigail Hill, Dawn Ward (Hull And East Yorkshire Hospitals NHS Trust); Sarah Cryan, Debbie Kemp, Cariosa Murray (Imperial College Healthcare NHS Trust); Ruth Redgrave (Ipswich Hospital NHS Trust); Amanda Rendell (Isle of Wight NHS Primary Care Trust); Gill Haliwell, Fiona Miles, Helen Smith (James Paget University Hospitals NHS Foundation Trust); Margaret Chinhoi, Jane Grant, Alison Whitwham (Kings College Hospital NHS Foundation Trust); Barbara Newman (Kingston Hospital NHS Trust); Katrina Rigby (Lancashire Teaching Hospitals NHS Foundation Trust); Jo Anker, Sue Corke, Gemma Hope, Janette Kirk, Coral Morby (Leeds Teaching Hospitals NHS Trust); Nahimatu Morton (Lewisham Hospital NHS Trust); Chelsea McDonough, Karen Comber, Joyce Davies (Liverpool Women's Hospital NHS Foundation Trust); Alison Heywood (Luton and Dunstable Hospital NHS Foundation Trust); Briony Beaumont, Gillian Duffey, Andrea Teasdale (Maidstone And Tunbridge Wells NHS Trust); Dorothy Turner (Mayday Healthcare NHS Trust); Marion Baker (Medway NHS Trust); Elizabeth Price (Mid Cheshire Hospitals NHS Trust); Nicola Bennett, Marianne Macrae, Lisa Trickey (Mid Essex Hospital Services NHS Trust); Katie Twigg, Karen White (Mid Staffordshire General Hospitals NHS Trust); Claire Hanson, Shirley Leonard (Mid Yorkshire Hospitals NHS Trust); Esther Valentine (Milton Keynes General Hospital NHS Trust); Claire Davenport (Newcastle Upon Tyne Hospitals NHS Foundation Trust); Elaine Carter, Tanisha Okoli (Newham University Hospital NHS Trust); Sarah Ardizzone, Deborah Caine, Wendy Wilson (Norfolk And Norwich University Hospital NHS Trust); Katherine Allen, Helen Onuora (North Bristol NHS Trust); Sarah Hall, Anna McSkeane, Ruth Singleton (North Cumbria Acute Hospitals NHS Trust); Alison Oldfield (North Middlesex University Hospital NHS Trust); Margaret Appleton (North Tees And Hartlepool NHS Trust); Maria Harrington, Trixie McAree (North West London Hospitals NHS Trust); Joanne Woodward (Northampton General Hospital NHS Trust); Susan Feuchtwanger (Northern Devon Healthcare NHS Trust); Julie Shaw (Northern Lincolnshire And Goole Hospitals NHS Trust); Rixt Finigan, Margaret Fittes, Geraldine McKay, Debbie Nicholson, Lisa Routledge, Kerry Rushton (Northumbria Health Care NHS Foundation Trust); Louise Dolby (Nottingham City PCT); Linda Allan, Rebecca Hales, Alison Sangwine, Laura Stewart-Maunder, Nicki Wiggins, Carolyn Willis (Oxford Radcliffe Hospitals NHS Trust); Vicki Brooks, Sheila Murray, Cat Partridge, Laura Scragg (Pennine Acute Hospitals NHS Trust); Diane Lynch, Debbie Waters (Peterborough and Stamford Hospitals NHS Foundation Trust); Tracey Sargent (Plymouth Hospitals NHS Trust); Sally Loven, Diane Maunder (Poole Hospital NHS Trust); Sarah Backhouse, Sally Evans, Vicky Hassell, Pat Mooney, Jill O'Sullivan, Mary Taylor (Portsmouth Hospitals NHS Trust); Sue Chisholm (Princess Alexandra Hospital NHS Trust); Stephanie Pease (Queen Elizabeth Hospital Kings Lynn NHS Trust); Trudy Hutson (Rotherham NHS Foundation Trust); Amanda Leeks, Catherine Verrecchia (Royal Berkshire NHS Foundation Trust); Audrey Wareham (Royal Bournemouth & Christchurch Hospitals NHS Foundation Trust); Helen Ross McGill (Royal Cornwall Hospitals NHS Trust); Teresa Ashford, Morwenna Marchant, Gwenllian Riall, Wendy Seddon (Royal Devon and Exeter NHS Foundation Trust); Elina Satokangas, Donna Thornley (Royal Free Hampstead NHS Trust); Rebecca Greenacre (Royal Surrey County Hospital NHS Trust); Kate Cheshire (Royal Wolverhampton Hospitals NHS Trust); Gillian Furey, Kay Murray (Salford Royal NHS Foundation Trust); Sue Fenwick (Salisbury NHS Foundation Trust); Esther Rackley, Sidonie Williams (Sandwell And West Birmingham Hospitals NHS Trust); Jane Millar (Scarborough And North East Yorkshire Health Care NHS Trust); Helen Baston (Sheffield Teaching Hospitals NHS Foundation Trust); Amanda Tucker (Sherwood Forest Hospitals NHS Trust); Louise Davies, Gail Edwards, Carolyn Forbes, Evelyn Hughes, Lisa Parton, Shirley Prince, Steph Taylor-Hodge, Laura Thomas, Sandy Ward (Shrewsbury and Telford Hospital NHS Trust); Jenny Walter (South Devon Healthcare NHS Trust); Elizabeth Anderson, Rosanne Gunn-Russell, Justine McGrady, Helen Taylor (South London Healthcare NHS Trust); Sue Symonds (South Tees Hospitals NHS Trust); Linda McNamee (South Tyneside NHS Foundation Trust); Deirdre Barrett, Sue Lambert (South Warwickshire General Hospitals NHS Trust); Katy Head, Sarah McCauley (Southampton University Hospitals NHS Trust); Tina Nugent (Southend University Hospital NHS Foundation Trust); Catherine Boyle (Southport and Ormskirk Hospital NHS Trust); Rixa Von Dem Bussche, Fui Chin (St George's Healthcare NHS Trust); Caroline Cunningham (St Helen’s and Knowsley Hospitals NHS Trust); Sheila Horrocks, Jo Thompson (Stockport NHS Foundation Trust); Maureen Royds-Jones (Surrey and Sussex Healthcare NHS Trust); Sandy

Richards (Swindon and Marlborough NHS Trust); Amanda Fletcher (Tameside and Glossop Acute Services NHS Trust); Siew Gin Bunce, Jan Davies, Carol Puckett, Pip Quinn (Taunton and Somerset NHS Trust); Libby Grooby, Dawn Thomas, Helen Ward (United Lincolnshire Hospitals NHS Trust); Jackie Baxter, Helle Nygaard (University College London Hospitals NHS Foundation Trust); Julie Eaton (University Hospital of North Staffordshire NHS Trust); Jen Pietroni (University Hospitals Bristol NHS Foundation Trust); Liz Bailey, Angela Bradley, Joanne Duffy (University Hospitals Coventry and Warwickshire NHS Trust); Andrea Dziemianko, Molly Patterson (University Hospitals of Leicester NHS Trust); Liz Gibbons, Julie Wren (University Hospitals of Morecambe Bay NHS Trust); Sue Davies, Lynne Serrage (University Hospitals of South Manchester NHS Foundation Trust); Linda Ball (Walsall Hospitals NHS Trust); Jude Haslam, Beverley Jessop (Warrington & Halton Hospital NHS Foundation Trust); Liz Murrell (West Dorset General Hospitals NHS Trust); Nora Lucey (West Hertfordshire Hospitals NHS Trust); Po Ying Li, Henrietta Nheta (West Middlesex University Hospital NHS Trust); Karen Bassingthwaighte (West Suffolk Hospitals NHS Trust); Kelly Pierce (Western Sussex Hospital NHS Trust); Christina McLaughlin (Weston Area Health NHS Trust); Kehinde Ayeni-Yegbe, Maria Gabas, Nobukhosi Kumson (Whipps Cross University Hospital NHS Trust); Nuala Hammond Norris, Leanne O'Shaughnessy (Whittington Hospital NHS Trust); Lorraine Blench, Anne Clark, Michelle Dugmore, Katherine Ford, Sue Forrester (Wiltshire PCT); Cindy Shawley (Winchester and Eastleigh Healthcare NHS Trust); Paula Brown, Sue Edwards (Wirral Hospital NHS Trust); Tamzyn Hyde, Jackie Lines, Susan Tabberer, Kay Watson (Worcestershire Acute Hospitals NHS Trust); Sandy Clayden (Worthing and Southlands Hospitals NHS Trust); Lesley Price (Wrightington, Wigan and Leigh NHS Trust); Angie Soughton (Yeovil District Hospital NHS Foundation Trust); Kath Thompson (York Hospitals NHS Trust)

Appendix references

1. Office for National Statistics. Birth statistics: Births and patterns of family building England and Wales 2007 (Series FM1, No. 36)2008.
2. Department of Health. Changing Childbirth, Part 1: Report of the Expert Maternity Group. London: 1993.
3. Department of Health. National Service Framework for Children, Young People and Maternity Services. Standard 11: Maternity Services. London: 2004.
4. Department of Health/Partnerships for Children Families and Maternity. Maternity Matters: Choice, access and continuity of care in a safe service. London: 2007.
5. Campbell R, Macfarlane A. Place of delivery: a review. Br J Obstet Gynaecol. 1986 Jul;93(7):675-83.
6. Campbell R, Macfarlane A. Where to be Born? The debate and the evidence. 2nd ed. Oxford: National Perinatal Epidemiology Unit; 1994.
7. MIDIRS. Place of Birth Informed Choice Leaflet. Bristol: 2005.
8. Stewart M, McCandlish R, Henderson J, Brocklehurst P. Review of evidence about clinical, psychosocial and economic outcomes for women with straightforward pregnancies who plan to give birth in a midwife-led birth centre, and outcomes for their babies. Report of a structured review of birth centre outcomes. Revised 2005. Oxford: National Perinatal Epidemiology Unit: 2004.
9. Olsen O, Jewell MD. Home versus hospital birth. Cochrane Database of Systematic Reviews. 1998(3):CD000352.
10. Olsen O. Meta-analysis of the safety of home birth. Birth. 1997 Mar;24(1):4-13.
11. de Jonge A, van der Goes BY, Ravelli AC, Amelink-Verburg MP, Mol BW, Nijhuis JG, et al. Perinatal mortality and morbidity in a nationwide cohort of 529,688 low-risk planned home and hospital births. BJOG. 2009 Aug;116(9):1177-84.
12. Janssen PA, Saxell L, Page LA, Klein MC, Liston RM, Lee SK. Outcomes of planned home birth with registered midwife versus planned hospital birth with midwife or physician. CMAJ. 2009 Sep 15;181(6-7):377-83.
13. Lindgren HE, Radestad IJ, Christensson K, Hildingsson IM. Outcome of planned home births compared to hospital births in Sweden between 1992 and 2004. A population-based register study. Acta Obstet Gynecol Scand. 2008;87(7):751-9.
14. Mori R, Dougherty M, Whittle M. An estimation of intrapartum-related perinatal mortality rates for booked home births in England and Wales between 1994 and 2003. BJOG. 2008 Apr;115(5):554-9.
15. Wax JR, Lucas FL, Lamont M, Pinette MG, Cartin A, Blackstone J. Maternal and newborn outcomes in planned home birth vs planned hospital births: a metaanalysis. Am J Obstet Gynecol. 2010 Sep;203(3):243 e1-8.
16. Gyte G, Dodwell M, Newburn M, Sandall J, Macfarlane A, Bewley S. Safety of planned home births. Findings of meta-analysis cannot be relied on. BMJ. 2010;341:c4033.
17. Department of Health. Improvement, expansion and reform - the next 3 years: priorities and planning framework 2003-2006: Department of Health: 2002.
18. Hodnett ED, Downe S, Walsh D, Weston J. Alternative versus conventional institutional settings for birth. Cochrane Database Syst Rev. 2010;9:CD000012.
19. Walsh D, Downe SM. Outcomes of free-standing, midwife-led birth centers: a structured review. Birth. 2004 Sep;31(3):222-9.
20. National Collaborating Centre for Women's and Children's Health. Intrapartum care: care of healthy women and their babies during childbirth. London: 2007.
21. McCandlish R, Rowe R. The Birthplace in England Research Programme Report of Component Study 1: Terms and Definitions. 2007; Available from: https://www.npeu.ox.ac.uk/birthplace/component-studies/tdc.
22. Dorling D. The North-South Divide. University of Sheffield; 2007 [12 October 2007]; Available from: http://sasi.group.shef.ac.uk/maps/nsdivide/index.html.
23. Healthcare Commission. Towards better births: A review of maternity services in England. London: Commission for Healthcare Audit and Inspection: 2008.
24. Maternity Care Working Party. Making normal birth a reality: NCT, RCM & RCOG: 2007.
25. Kurinczuk J, Barralett J, Redshaw M, Brocklehurst P. Monitoring the incidence of neonatal encephalopathy - what next? Report to the Patient Safety Research Programme. Oxford: NPEU: 2005.
26. McCandlish R, Bowler U, van Asten H, Berridge G, Winter C, Sames L, et al. A randomised controlled trial of care of the perineum during second stage of normal labour. Br J Obstet Gynaecol. 1998 Dec;105(12):1262-72.

27. Rogers J, Wood J, McCandlish R, Ayers S, Truesdale A, Elbourne D. Active versus expectant management of third stage of labour: the Hinchingbrooke randomised controlled trial. Lancet. 1998 Mar 7;351(9104):693-9.
28. NICE. Obesity: guidance on the prevention, identification, assessment and management of overweight and obesity in adults and children. NICE; 2006.
29. Gray R, Headley J, Oakley L, Kurinczuk J, Brocklehurst P, Hollowell J. Inequalities in infant mortality project briefing paper 3. Towards an understanding of variations in infant mortality rates between different ethnic groups. Oxford: National Perinatal Epidemiology Unit, 2009.
30. Normand SLT, Landruma MB, Guadagnolia EA, J. Z. , Ryand TJ, Clearya PD, McNeila BJ. Validating recommendations for coronary angiography following acute myocardial infarction in the elderly:: A matched analysis using propensity scores. Journal of clinical epidemiology. 2001;54(4):387-98.