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Supplementary material

Supplementary table 1. STROBE Statement—Checklist of items that should be included in reports of cohort studies

| | Item No | Recommendation | Page |
|------------------------------|------------|--|----------------|
| Title and abstract | 1 | (a) Indicate the study's design with a commonly used term in the title or the abstract | 1 |
| | | (b) Provide in the abstract an informative and balanced summary of what was done and what was found | 2 |
| Introduction | | | |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported | 5 |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | 5 |
| Methods | | | |
| Study design | 4 | Present key elements of study design early in the paper | 5 |
| Setting | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | 7 |
| Participants | 6 | (a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up | 8 |
| | | (b) For matched studies, give matching criteria and number of exposed and unexposed | Na |
| Variables | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | 9-12 |
| Data sources/ measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | 8- 10,14/15 |
| Bias | 9 | Describe any efforts to address potential sources of bias | 17/18 |
| Study size | 10 | Explain how the study size was arrived at | 6/7 |
| Quantitative variables | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | 8- 10,14/15 |
| Statistical methods | 12 | (a) Describe all statistical methods, including those used to control for confounding | 13-16 |
| | | (b) Describe any methods used to examine subgroups and interactions | 16 |
| | | (c) Explain how missing data were addressed | 17 |
| | | (d) If applicable, explain how loss to follow-up was addressed | Na |
| | | (e) Describe any sensitivity analyses | 16/17 |
| Results | | | |

| | | | |
|--------------------------|-----|--|----|
| Participants | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | NA |
| | | (b) Give reasons for non-participation at each stage | NA |
| | | (c) Consider use of a flow diagram | NA |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders | NA |
| | | (b) Indicate number of participants with missing data for each variable of interest | NA |
| | | (c) Summarise follow-up time (eg, average and total amount) | NA |
| Outcome data | 15* | Report numbers of outcome events or summary measures over time | NA |
| Main results | 16 | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | NA |
| | | (b) Report category boundaries when continuous variables were categorized | NA |
| | | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | NA |
| Other analyses | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses | NA |
| Discussion | | | |
| Key results | 18 | Summarise key results with reference to study objectives | NA |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias | NA |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | NA |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results | NA |
| Other information | | | |
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | 19 |

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at <http://www.strobe-statement.org>.

NICE Intrapartum Care Guidelines

Table 1 and 2 show extracts from NICE Guidance² providing medical conditions or situations in which there is 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. The factors listed in appendix table 3 and 4 are not reasons in themselves for advising birth within an obstetric unit, but indicate that further consideration of birth setting may be required.

Supplementary table 2. Medical conditions indicating increased risk suggesting planned birth at an obstetric unit

| Disease area | Medical condition |
|------------------|--|
| Cardiovascular | <ul style="list-style-type: none"> Confirmed cardiac disease Hypertensive disorders |
| Respiratory | <ul style="list-style-type: none"> Asthma requiring an increase in treatment or hospital treatment Cystic fibrosis |
| Haematological | <ul style="list-style-type: none"> Haemoglobinopathies – sickle-cell disease, beta-thalassaemia major History of thromboembolic disorders Immune thrombocytopenia purpura or other platelet disorder or platelet count below 100×10^9/litre Von Willebrand's disease Bleeding disorder in the woman or unborn baby Atypical antibodies which carry a risk of haemolytic disease of the newborn |
| Endocrine | <ul style="list-style-type: none"> Hyperthyroidism Diabetes |
| Infective | <ul style="list-style-type: none"> Risk factors associated with group B streptococcus whereby antibiotics in labour would be recommended Hepatitis B/C with abnormal liver function tests Carrier of/infected with HIV Toxoplasmosis – women receiving treatment Current active infection of chicken pox/rubella/genital herpes in the woman or baby Tuberculosis under treatment |
| Immune | <ul style="list-style-type: none"> Systemic lupus erythematosus Scleroderma |
| Renal | <ul style="list-style-type: none"> Abnormal renal function Renal disease requiring supervision by a renal specialist |
| Neurological | <ul style="list-style-type: none"> Epilepsy Myasthenia gravis Previous cerebrovascular accident |
| Gastrointestinal | <ul style="list-style-type: none"> Liver disease associated with current abnormal liver function tests |
| Psychiatric | <ul style="list-style-type: none"> Psychiatric disorder requiring current inpatient care |

Supplementary table 3. Other factors indicating increased risk suggesting planned birth at an obstetric unit

| Factor | Additional information |
|---------------------------------|---|
| Previous complications | <ul style="list-style-type: none"> • Unexplained stillbirth/neonatal death or previous death related to intrapartum difficulty • Previous baby with neonatal encephalopathy • Pre-eclampsia requiring preterm birth • Placental abruption with adverse outcome • Eclampsia • Uterine rupture • Primary postpartum haemorrhage requiring additional treatment or blood transfusion • Retained placenta requiring manual removal in theatre • Caesarean section • Shoulder dystocia |
| Current pregnancy | <ul style="list-style-type: none"> • Multiple birth • Placenta praevia • Pre-eclampsia or pregnancy-induced hypertension • Preterm labour or preterm prelabour rupture of membranes • Placental abruption • Anaemia – haemoglobin less than 85 g/litre at onset of labour • Confirmed intrauterine death • Induction of labour • Substance misuse • Alcohol dependency requiring assessment or treatment • Onset of gestational diabetes • Malpresentation – breech or transverse lie • BMI at booking of greater than 35 kg/m² • Recurrent antepartum haemorrhage • Small for gestational age in this pregnancy (less than fifth centile or reduced growth velocity on ultrasound) • Abnormal fetal heart rate/doppler studies • Ultrasound diagnosis of oligo-/polyhydramnios • Cholestasis* • Labour outside of 37+0 and 41+6* |
| Previous gynaecological history | <ul style="list-style-type: none"> • Myomectomy • Hysterotomy |

**Some additional conditions, not included in the NICE guidelines, have been identified that if present would be also regarded as contraindications to pool use in labour and therefore if present would classify the woman as 'high risk'*

Supplementary table 4. Medical conditions indicating individual assessment when planning place of birth

| Disease area | Medical condition |
|-----------------------|--|
| Cardiovascular | <ul style="list-style-type: none"> • Cardiac disease without intrapartum implications |
| Haematological | <ul style="list-style-type: none"> • Atypical antibodies not putting the baby at risk of haemolytic disease • Sickle-cell trait • Thalassaemia trait • Anaemia – haemoglobin 85–105 g/litre at onset of labour |
| Infective | <ul style="list-style-type: none"> • Hepatitis B/C with normal liver function tests |
| Immune | <ul style="list-style-type: none"> • Non-specific connective tissue disorders |
| Endocrine | <ul style="list-style-type: none"> • Unstable hypothyroidism such that a change in treatment is required |
| Skeletal/neurological | <ul style="list-style-type: none"> • Spinal abnormalities • Previous fractured pelvis • Neurological deficits |

Supplementary table 5. Other factors indicating individual assessment when planning place of birth

| Factor | Additional information |
|---------------------------------|---|
| Previous complications | <ul style="list-style-type: none"> • Stillbirth/neonatal death with a known non-recurrent cause • Pre-eclampsia developing at term • Placental abruption with good outcome • History of previous baby more than 4.5 kg • Extensive vaginal, cervical, or third- or fourth-degree perineal trauma • Previous term baby with jaundice requiring exchange transfusion |
| Current pregnancy | <ul style="list-style-type: none"> • Antepartum bleeding of unknown origin (single episode after 24 weeks of gestation) • BMI at booking of 30–35 kg/m² • Blood pressure of 140 mmHg systolic or 90 mmHg diastolic or more on 2 occasions • Clinical or ultrasound suspicion of macrosomia • Para 4 or more • Recreational drug use • Under current outpatient psychiatric care • Age over 35 at booking |
| Fetal indications | <ul style="list-style-type: none"> • Fetal abnormality |
| Previous gynaecological history | <ul style="list-style-type: none"> • Major gynaecological surgery • Cone biopsy or large loop excision of the transformation zone • Fibroids |

Supplementary table 6. Wellbeing software fields for primary and secondary outcomes

| Outcome | Data source (E3/NNRD) R=retro P=prosp | E3/NNRD Field name | Population |
|--|--|---|-----------------------------|
| Maternal outcomes | | | |
| Primary outcome | | | |
| Obstetric Anal Sphincter Injuries (OASI) | E3R/P | AnalgesiaPerineum PerinealRepair PerineumVaginalTears ConsentSuturing | All women |
| Secondary outcomes | | | |
| Intrapartum | | | |
| Shoulder dystocia | E3R/P | EpisiotomyReason ShoulderDystocia ShoulderDystociaHelp HeadDeliveredMode | All women |
| Required management of shoulder dystocia | E3R/P | In babies with shoulder dystocia: McRoberts ManoeuvresPerformed SuprapubicPressure EpisiotomyPerformed PosteriorArm WoodScrewManoeuvre AllFoursPosition OtherManoeuvres | In babies with sh. dystocia |
| Time from Head born to time of birth (the longer duration the worst outcome) | E3R/P | To be derived by E3: HeadDeliveredToBirthDuration | All women |
| Management of the third stage of labour | E3 P E3 R/P | POOLThirdStageMgt/POOLPlacentaDelivered/ Intended PlacentadeliveredHow OxytocinDrug3rd Stage Analgesia3rdStage | All women with a pool birth |
| Need and reason for obstetric involvement in woman's care including sepsis | E3 P E3R/P | At labour: POOLObstetricCare Postnatally: | All women that used a pool |

| Outcome | Data source (E3/NNRD) R=retro P=prosp | E3/NNRD Field name | Population |
|--|--|--|------------|
| | | AnalgesiaPerineum AnaesProcedurePerformed AnaesthesiaAtCaesarean AnalgesiaDelivery DrugsPostDelivery IVTherapyPostDelivery LabourAugmented MLUTransferredOut MLUTransferReason MonitoringChangedInLabour PerineumVaginalTears PlaceOfBirth PlacentaDeliveredHow (MROP) PNT_OtherProbs POOLobstetricCare PostnatalProblems ProblemsIntrapartum ProblemsMaternal ProblemsPostDelivery ReasonForChangeAN ReasondelPlaceChange Transferred TransferHospital (variables to pick up sepsis) PostnatalProblems Problemspostdelivery problemsintrapartum | All women |
| Maternal position during vaginal birth | E3R/P | DeliveryPosition Semi-recumbent Left lateral Squatting Kneeling | All women |

| Outcome | Data source (E3/NNRD) R=retro P=prosp | E3/NNRD Field name | Population |
|---|--|---|------------|
| | | All fours Lithotomy Other Birthing stool Standing | |
| Treatment for haemorrhage 1. was there a haemorrhage? (PPH defined as blood loss >500ml, >1,000ml) 2. treatment for haemorrhage (Massive obstetric haemorrhage >1500ml) | E3R/P | BloodLossAtDelivery +BloodLossAfterDelivery AnaesCriticalIncidents(>1L) ProblemsPostDelivery 3 rd stage drugs: PlacentadeliveredHow OxytocinDrug3rd Stage IVTherapyPostDelivery | All women |
| | | 3rdstage fluids: BloodTransfusion MOHcause MOHManagement MOHOperativeIntervention MOHBloodProductsInfused PNT_BloodTransfusion | |
| Incidence of perineal and other genital trauma | E3R/P | PerineumVaginalTears PerinealRepair Anagesia3rdstage | All women |
| Management of perineal and other genital trauma | | PerinealRepair: Interrupted (labial lacerations only) Interrupted 1 layer repair Interrupted 2 layer repair Continuous 1 layer repair Continuous 2 layer repair End to end (3rd degree tear) Overlapping (3rd degree tear) | |

| Outcome | Data source (E3/NNRD) R=retro P=prosp | E3/NNRD Field name | Population |
|--|--|--|--|
| Postnatal | | | |
| Duration of postnatal stay | E3R/P | PN_StayDuration | All women |
| Breast feeding initiation and continuation (at community discharge) | E3R/P | Fed1hour PNT_Feeding Method FeedingMethodDelivery BNT_FeedingMethod BNT_FeedingType BNT_Breastmilk48Hrs BreastFeedingAt10Days FDFeeding (final discharge) | All women |
| Higher level care (NB many delivery suites provide a HDU care so may not say) | E3R/P | Postnatal problems Transferred (ITU/HDU/other->main recovery) PNT_Mode PNT_DischargeMethod AnaesCriticalIncidents | All women |
| Maternal readmission to hospital within seven days of birth | E3R/P | ReAdmission PNT_Reason PNT_RoutineCare | All women |
| Infant Outcomes | | | |
| Primary outcome | | | |
| Composite of 'adverse infant outcomes or treatment' to include: | | | |
| a) any neonatal unit admission | E3R/P | TransferToNN4B/BNT_Separation/ BNT_ReasonNICUAdmission/ BNT_LengthNICUAdmission/ BNT_Destination TimeBirthToResps | All babies |
| requiring respiratory support | NNRD | Respsupportgiven/numberofrespsdays/ Methods1-14 | |
| b) intravenous antibiotic administration within 48 hours of birth (with or without culture proven infection) | E3 P | POOLAntibioticCommenced POOLAntibioticDuration | All babies whose mother had a pool birth |
| | NNRD | anti48given | |
| c) intrapartum stillbirth or infant death prior to neonatal unit/postnatal ward discharge | E3 | Outcome/ PbRComplications/ StillbirthClassification | All babies |
| | NNRD | Death | |

| Outcome | Data source (E3/NNRD) R=retro P=prosp | E3/NNRD Field name | Population |
|---|--|---|------------------------------|
| Secondary outcomes | | | |
| Timing of cord clamping | E3R/P NNRD | CordClamping CordClamp TimeOfCordClamp | All babies |
| Apgar scores | E3R/P / NNRD | Apgar1MinuteNN4B_Value Apgar5Minutes_Value Apgar_1min Apgar_5min | All babies |
| Incidence of: | | | |
| NNU admissions requiring respiratory support | | numberofadmissions Respsupportgiven | |
| Administration and duration of intravenous antibiotics | E3 P NNRD | POOLAntibioticsCommenced POOLAntibioticsDuration antiGivenIV/numberofantidays | All babies |
| Cause of intrapartum stillbirth or all deaths prior to neonatal unit/postnatal ward discharge, neonatal deaths that occurred within seven days of birth on a neonatal unit/postnatal ward | E3R/P NNRD | Outcome (live-/stillbirth/early neonatal death) StillbirthClassification CauseofDeath1-3 | All babies |
| Neonatal resuscitation | E3R/P NNDR | DrugsotherProcedures (intubation) DurationBirthToIntubation IntermitPosPresVenti DurationO2Intubation TimeBirthToResps Methods1-14 | All babies |
| snapped umbilical cord prior to clamping | E3 P | CordSnap | All babies |
| skin to skin contact at birth | E3 R/P | SkinToSkinContact SkinToSkinDuration | All babies |
| first breastfeed within first hour | E3 R/P | Fed1Hour | All babies |
| culture proven infection | E3 P NNRD | POOLBloodCulture POOLCRPResult AnyGrowth | All babies given antibiotics |
| brachial plexus injury | E3 R/P NNRD | BirthInjurySuspected brachialplexus_injury | All babies |
| treatment for jaundice | E3 R/P | BNT_JaundiceTreatment BNT_Admitreason | All babies |

| Outcome | Data source (E3/NNRD) R=retro P=prosp | E3/NNRD Field name | Population |
|--|--|--|------------------------------|
| | NNRD | BNT_ProblemsPriorDischarge JaundiceTreatmentGiven | |
| readmission to hospital within seven days of birth | E3 R/P NNRD | BNT_Admitreason BNT_ActionTaken readmission | All babies |
| Therapeutic hypothermia | NNRD | thGiven | All babies |
| Neonatal unit admissions | NNRD | numberofadmissions | All babies |
| Respiratory support (same as primary) | NNRD | Respsupportgiven | All babies |
| Confirmed neonatal sepsis | | | |
| Highest CRP results | E3 P | POOLCRPResult | All babies given antibiotics |
| Successful / attempted lumbar puncture | E3 P | POOLBabyLumbarPunc | All babies given antibiotics |
| Blood culture positive with a recognised pathogen (excluding skin commensal organisms) | E3 P NNRD | POOLBloodCulture | All babies given antibiotics |
| Delivery of placenta in or out of water | E3 P | POOLPlacentaDelivered PlacentaDeliveredHow | All women with a pool birth |
| Third stage management | E3 R/P | | |