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Intrapartum-related perinatal deaths in births planned in midwifery-led settings in Great Britain: findings and recommendations from the ESMiE confidential enquiry

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Objective To review quality of care in births planned in midwifery-led settings, resulting in an intrapartum-related perinatal death.

Design Confidential enquiry.

Setting England, Scotland and Wales.

Sample Intrapartum stillbirths and intrapartum-related neonatal deaths in births planned in alongside midwifery units, freestanding midwifery units or at home, sampled from national perinatal surveillance data for 2015/16 (alongside midwifery units) and 2013–16 (freestanding midwifery units and home births).

Methods Multidisciplinary panels reviewed medical notes for each death, assessing and grading quality of care by consensus, with reference to national standards and guidance. Data were analysed using thematic analysis and descriptive statistics.

Results Sixty-four deaths were reviewed, 30 stillbirths and 34 neonatal deaths. At the start of labour care, 23 women were planning birth in an alongside midwifery unit, 26 in a freestanding midwifery unit and 15 at home. In 75% of deaths,

improvements in care were identified that may have made a difference to the outcome for the baby. Improvements in care were identified that may have made a difference to the mother's physical and psychological health and wellbeing in 75% of deaths. Issues with care were identified around risk assessment and decisions about planning place of birth, intermittent auscultation, transfer during labour, resuscitation and neonatal transfer, follow up and local review.

Conclusions These confidential enquiry findings do not address the overall safety of midwifery-led settings for healthy women with straightforward pregnancies, but suggest areas where the safety of care can be improved. Maternity services should review their care with respect to our recommendations.

Keywords Birth centres, home birth, midwifery, perinatal death, quality of health care, stillbirth.

Tweetable abstract Confidential enquiry of intrapartum-related baby deaths highlights areas where care in midwifery-led settings can be made even safer.

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Introduction

Stillbirth and neonatal mortality rates in the United Kingdom remain high compared with other similar countries.^{1,2} National policy aims to halve the rates of stillbirth, neonatal death and perinatal brain injury by 2025;³ intrapartum-

related perinatal deaths have been identified as a group where improvements in perinatal care have the potential to improve outcomes.^{4–6}

Confidential enquiries are an established method for assessing quality of care against national standards and guidance, usually when adverse events such as death or

serious morbidity occur. A UK-wide confidential enquiry of 78 term intrapartum stillbirths and intrapartum-related neonatal deaths, carried out in 2015 by the MBRRACE-UK collaboration as part of the national Maternal, Newborn and Infant Clinical Outcome Review Programme (MNICORP), identified overall improvements in care that may have made a difference to the outcome for the baby in 80% of the deaths.⁶ Key issues included: failure to recognise the transition from the latent to the active phase of labour and institute appropriate monitoring; incomplete or inadequate maternal monitoring; errors in the method, interpretation, escalation and response to fetal monitoring; variable quality of bereavement care and poor-quality local reviews.

In the UK most women give birth in hospital obstetric units (OU),⁷ so most of the 78 deaths in the MBRRACE-UK enquiry occurred in planned OU births.⁶ National guidance and standards recommend that women who are healthy with straightforward pregnancies should have the choice of care in an OU or in a midwifery-led setting, including birth at home; in an alongside midwifery unit on the same site as an OU; or in a freestanding midwifery unit, on a site geographically separate from an OU.^{8–12} The number of midwifery units and the number of women giving birth in midwifery-led settings is increasing,^{7,13–16} in 2015 in England around 15% of women gave birth in a midwifery-led setting, compared with around 5% in 2007.^{7,13} Intrapartum-related perinatal deaths are uncommon, occurring in around 1 in every 3500 births in the UK;⁶ there is no evidence that they are more common in births planned in midwifery-led settings compared with births planned in OUs.^{17,18} However, deaths in births planned in midwifery-led settings are important to investigate because the nature of any issues with care may be different compared with births planned in OUs, particularly for births in freestanding units and at home.

In ESMiE (Enhancing the safety of Midwifery-led births Enquiry), we aimed to review the quality of care during pregnancy, labour, birth and postpartum received by women and babies in births planned in midwifery units and at home, which resulted in an intrapartum-related perinatal death, to identify care that could be improved. This paper briefly describes issues with care that were the same as those identified in planned OU births in the 2015 MBRRACE-UK enquiry,⁶ and focuses in detail on issues that were different or that have particular relevance for care in midwifery-led settings.

Methods

We carried out a confidential enquiry using MBRRACE-UK methods.⁶

Inclusion criteria and sampling

We included intrapartum stillbirths and intrapartum-related neonatal deaths (defined in the Supplementary material, Table S1) occurring in term births where the planned place of birth at the start of labour care was an alongside or freestanding midwifery unit, or at home, in England, Wales and Scotland. We identified potentially eligible deaths from the MBRRACE-UK national perinatal surveillance data, drawing a stratified random sample to ensure all midwifery-led settings were represented in sufficient and broadly equal numbers, with similar numbers of stillbirths and neonatal deaths. To ensure similar numbers in each planned birth setting, planned alongside midwifery unit births were sampled from 2015 to 2016, and planned freestanding midwifery unit and home births, where there are fewer births, from 2013 to 2016. To account for differences in admission pathways we used slightly different inclusion criteria for the different settings (see Supplementary material, Table S2).

Case note management

Invited hospitals for the sampled deaths provided all available medical notes for the mother and baby. Identifiable data relating to the mother and baby were redacted and the redacted notes were scanned and uploaded to the secure MBRRACE-UK case notes viewing system.

Enquiry panel process

Confidential enquiry panel reviews took place from October 2017 to July 2019. Panel members were invited from a pool of 73 midwives, 22 consultant obstetricians, 16 consultant neonatologists and 9 perinatal pathologists. Each panel comprised a minimum of: two midwives (including midwives with experience of working in a midwifery-led setting and bereavement midwives), two obstetricians, two neonatologists and one pathologist. Panel meetings were chaired by members of the evaluation team (ESD, SK, JJK and RR) and were facilitated by JD and RR. Representatives of Sands, the stillbirth and neonatal death charity, observed two panels.

At each panel four to six deaths were reviewed, with reference to relevant national standards and guidance. Panels were convened until no new themes emerged.

Data collected

For each stage of the care pathway, good practice points or issues with care were graded by consensus and recorded on a standardised evaluation form, using the MBRRACE-UK gradings for quality and relevance to outcome (see Supplementary material, Table S3); this process generated both qualitative (text) and quantitative data. An overall grading of care was agreed by consensus, for both the care of the baby and the care of the mother after the baby had died, using the MBRRACE-UK classification (see Supplementary

material, Table S3). A narrative summary describing the overall care was written and agreed.

Additional quantitative data describing the care provided were recorded using an enquiry-specific checklist developed from the 2015 MBRRACE-UK enquiry,⁶ with the addition of extra items, for example, changes in planned place of birth and transfer.

A core outcome set was not used.

Data management and analysis

MBRRACE-UK perinatal surveillance data about maternal and other characteristics for the deaths reviewed and those that were potentially eligible, but not sampled, were compared using percentages and the chi-square test.

All text and grading data from the consensus evaluation form were imported into the software package NVivo (version 12).¹⁹ These data were read and re-read by RR to develop descriptive and analytical codes describing emerging themes, which were then applied across the data set. Emerging findings were discussed by RR and JJK during analysis and codes/themes were revised as necessary. The evaluation team then formally compared the findings with those from the 2015 MBRRACE-UK enquiry.⁶ Anonymised vignettes were chosen to illustrate findings.

Quantitative checklist and evaluation form data were imported into STATA SE (version 15)²⁰ and summarised using percentages.

Parent and public involvement

The aim of parent and public involvement was to ensure that the views of bereaved parents informed the design, interpretation and dissemination of the enquiry. We benefited from the involvement of representatives of key charities working with bereaved parents in the 2015 MBRRACE-UK enquiry.⁶ CB, from Sands, was a member of the evaluation team, contributing to co-investigator group meetings throughout.

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Results

Sample

Sixty-four perinatal deaths were reviewed, 30 stillbirths and 34 neonatal deaths (see Supplementary material, Figure S1), at 13 panel meetings.

Representativeness of the sample

Apart from planned place of birth and outcome, there were no significant differences between the 64 deaths reviewed and the 93 other deaths that were potentially eligible, but not sampled, for any of the sociodemographic, behavioural and care characteristics for which data were available (see Supplementary material, Table S4). The oversampling used to ensure sufficient numbers of deaths from each planned birth setting, and similar numbers of stillbirths and neonatal deaths, is reflected in the significant differences between the deaths reviewed and those potentially eligible, but not reviewed.

Planned and actual place of birth

At the start of labour care, 23 women were planning birth in an alongside midwifery unit, 26 in a freestanding midwifery unit and 15 at home (Figure 1). Overall, 18 women (28%) gave birth in the setting they were planning to give birth in at the start of labour care. Two women, both planning a home birth, gave birth in an ambulance.

Grading of quality of care

In 70% ($n = 21$) of intrapartum stillbirths and 79% ($n = 27$) of intrapartum-related neonatal deaths, panels identified improvements in care that may have made a difference to the outcome for the baby; 75% overall (Table 1). In terms of the mother's physical and psychological outcome and/or future wellbeing, improvements in care were identified that may have made a difference to the outcome in 53% ($n = 16$) of intrapartum stillbirths and 94% ($n = 32$) of intrapartum-related neonatal deaths; 75% overall. Data about the poorest quality of care at each point on the care pathway, in cases where care had a potential adverse impact on outcome, are summarised in the Supplementary material (Table S5).

Themes recurring from previous intrapartum-related enquiry

A number of themes arising from this enquiry echoed those identified in the 2015 MBRRACE-UK enquiry, in which most births were planned in OUs.⁶ These are summarised briefly in Box 1.

New themes or those with particular relevance for midwifery-led settings

Planning place of birth and risk assessment

During pregnancy. For 28 women (44%), risk factors relevant to discussions and decisions about planned place of birth (e.g. previous postpartum haemorrhage, fetal growth concerns, mental health problems) were present at booking or developed during pregnancy; for 12 women these risk factors were not recognised by the health professionals

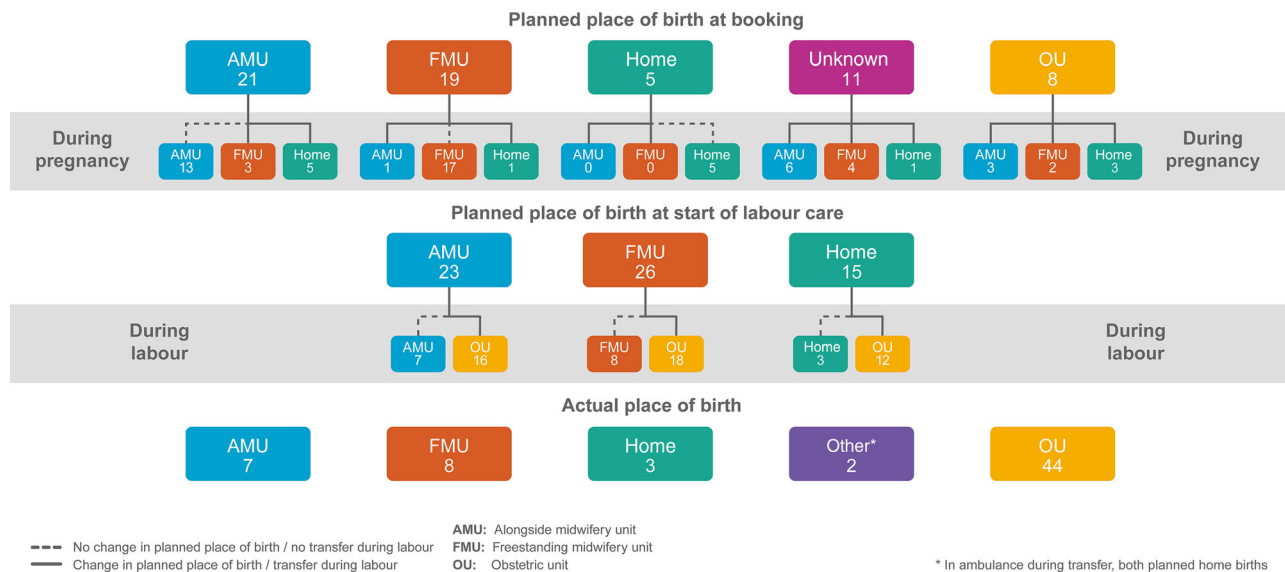


Figure 1. Planned and actual place of birth.

Table 1. Overall grading of quality of care

Panel consensus	Stillbirth n = 30		Neonatal death n = 34		All n = 64	
	n	%	n	%	n	%
Outcome for the baby						
Good; no improvements in care identified	3	10	0	0	3	5
Improvements in care identified that would have made no difference to outcome	6	20	7	21	13	20
Improvements in care identified that may have made a difference to outcome	21	70	27	79	48	75
Outcome for the mother						
Good; no improvements in care identified	6	20	0	0	6	9
Improvements in care identified that would have made no difference to outcome	8	27	2	6	10	16
Improvements in care identified that may have made a difference to outcome	16	53	32	94	48	75

providing care. For only five women with risk factors (18%) was there any evidence of a care plan being put in place to manage risks in a midwifery-led setting.

For 21 women (34%), panels identified good care in relation to risk assessment, including appropriate booking for midwifery-led care, or a good discussion and documentation around planned place of birth (Vignette 1, Box 2).

For 24 women (39%), panels identified issues with care in relation to management of risk factors, lack of appropriate risk assessment for planning birth in a midwifery-led setting, lack of care planning in the presence of risk factors, or lack of discussion or documentation about the risks and benefits of different birth settings. For 12 women, this was judged to be probably or almost certainly relevant to the outcome for the baby.

At the start of labour care. Overall, 25 women (39%) presented at the start of labour care with existing risk factors or emerging complications indicating that transfer to obstetric-led care should have been considered or discussed (Vignette 2, Box 2). These complications included: reduced fetal movements, meconium-stained liquor, prolonged rupture of membranes and post-term pregnancy. In 15 (60%) of these women the panels considered that management of the woman's care was not appropriate.

For 20 women (32%), panels identified inadequate risk assessment at the start of labour care; in 13 of these women there were also issues in relation to risk assessment or birth-place planning during pregnancy. For 12 women this was judged to be probably or almost certainly relevant to the outcome for the baby.

Box 1. Summary of issues with care which were also identified in the 2015 MBRRACE-UK intrapartum-related confidential enquiry**Antenatal care****Screening for fetal growth**

No growth chart in notes, inconsistent or incorrect plotting or frequency of symphysis fundal height measurements, failure to refer for ultrasound when indicated or to act appropriately after referral.

Management of reduced fetal movements

Care following reported reduced fetal movements that did not follow national guidance.

Intrapartum care**Care of women in the latent phase**

Inappropriate frequency of observations and lack of care planning, failure to recognise start of established labour leading to failure to initiate monitoring of fetal wellbeing.

Maternal monitoring

Lack of or infrequent vaginal examinations, incomplete or poor partogram completion, inadequate maternal observations leading to uncertainty about stage of labour or progress in labour and failure to appropriately assess maternal and fetal wellbeing.

Continuous electronic fetal monitoring

Lack of systematic review, or delay in obstetric review, of continuous electronic fetal monitoring; failure to recognise, or delay in recognising, pathological cardiotocographs and/or to act appropriately; delay in establishing continuous electronic fetal monitoring after transfer; poor quality cardiotocographs trace.

Resuscitation

Failure to follow resuscitation guidance or documentation that was insufficiently clear, inadequate leadership around resuscitation.

Postnatal and bereavement care

Poor or undocumented postnatal care, including failure to carry out appropriate tests or investigations; undocumented, inadequate or fragmented bereavement care.

Follow-up appointment

Inappropriate timing of follow up (too soon or too late); insensitive, inadequate or inaccurate follow-up letter to parents, including letters to another health professional copied to parents, or no letter at all.

Post mortem

Placenta not available for histology, placental histology poor or not incorporated with the rest of the post-mortem findings, lack of appropriate clinico-pathological correlation, poor post mortem, which failed to identify cause of death.

Local review of care

Inappropriate composition of review panel, review did not consider the whole care pathway, review did not incorporate results of pathology or post mortem.

Situational awareness and capacity

Lack of situational awareness or the ability to stand back, see the whole picture and respond appropriately; insufficient staff and/or space, and equipment issues, often as result of increased activity.

Planning home birth against advice. Ten of the 15 women planning home birth had risk factors for complications during labour or birth identified during pregnancy. Five of these ten women planned birth at home against advice from health professionals. For four of these the panel considered that this was a contributory factor in the outcome for the baby, although for three women they also concluded that health professionals could have done

more to engage with the mother. Issues common to these cases included the woman not engaging with antenatal care and/or not revealing health concerns; health-care professionals not escalating their concerns about risk factors or the woman's wellbeing; and the woman declining care and/or interventions when offered, including scans, induction, fetal monitoring, vaginal examinations and transfer.

Box 2. Vignettes illustrating examples of good practice and issues with care**Vignette 1: Good practice in risk assessment and planning**

A nulliparous woman originally booked for care in an OU had documented discussions about place of birth at booking, at 25 and 28 weeks of gestation. At 28 weeks of gestation, there was a documented decision for a home birth. At 34 weeks of gestation, care was transferred to the home-birth team and documented discussions about the decision for a home birth continued. At 41 weeks, labour started at home. There was a documented risk assessment that confirmed she was still suitable for a home birth. During labour, fetal heart rate abnormalities were recognised promptly. Transfer to the OU was arranged immediately and there were no delays in transfer or in the provision of care on arrival. The baby was born shortly afterwards with no signs of life and resuscitation was unsuccessful.

Vignette 2: Risk assessment and planning – failure to risk assess appropriately during pregnancy and on admission

A woman with previous small-for-gestational-age babies and a body mass index >35 kg/m² booked for a freestanding midwifery unit birth with no documented discussion about place of birth and no care plan. Serial growth scans showed normal growth. The woman self-referred to the freestanding midwifery unit twice in the same week at term in the latent stage of labour, but there was no documented risk assessment at either visit. Following a third attendance in the same week in the latent stage the woman was admitted. Five hours after admission, the fetal heart could not be heard; there was a delay in calling the ambulance. The woman arrived at the OU over an hour after the fetal heart was last heard and was seen promptly, but the baby's death was confirmed by ultrasound and the baby was stillborn.

Vignette 3: Delay in decision to transfer and assess on arrival at the OU

A low-risk woman with straightforward antenatal care received good continuity of care and planned a home birth after a clear documented discussion. During labour the midwives appropriately called for advice when they had concerns about fetal wellbeing and transfer was agreed. However, there was a delay in calling for an ambulance and the ambulance took a long time to arrive resulting in a 1-hour delay from the decision to transfer to arrival in the OU. Once she arrived there was a further delay before obstetric review and there was no recognition or review of a pathological cardiotocograph in the second stage. The baby was born in a poor condition and resuscitated, but later died.

Vignette 4: Intermittent auscultation not following national guidance

A low-risk woman was booked appropriately for an alongside midwifery unit birth. On arrival at the alongside midwifery unit in early labour she reported reduced fetal movements in the 24 hours before admission; however, there was no documentation of a risk assessment taking this into account. The fetal heart rate was not monitored according to national guidance throughout labour: the heart rate was always rounded to the nearest five; baseline tachycardia was inappropriately recorded as a range; the frequency of intermittent auscultation was inappropriate; and there was no appropriate response to decelerations in the second stage of labour. The baby was born in poor condition and resuscitated, but later died.

Vignette 5: Resuscitation and transfer of a compromised baby

Following inadequate risk assessment on arrival in labour and inappropriate monitoring in labour a baby was born in a freestanding midwifery unit in poor condition. Resuscitation was commenced by the midwife. At 8 minutes, a consultant paediatrician was phoned for advice who advised continuing resuscitation and then calling an ambulance. An emergency crash call was placed for the local emergency team, but there were issues with their prompt attendance. At 16 minutes after birth an ambulance was called, which arrived quickly. The time from birth to arrival at the hospital was over an hour. The baby was subsequently transferred to a tertiary centre for treatment, but later died.

Transfer during labour

Overall, 46 women (72%) were transferred to obstetric care during labour; two women gave birth during transfer. Of the 18 women who were not transferred, in nine women there was no identified indication for transfer and in the remaining nine, by the time transfer was considered, labour was too advanced to transfer the woman safely.

For 11 women (24%), panels identified good care in relation to transfer, including appropriate decision-making or timing. For 35 women, issues with care were identified in relation to transfer, including three women for whom the panels considered that the woman should have been transferred, but was not. For 24 women, panels noted delay in recognising the need for transfer, in arranging transfer with appropriate urgency, in the attendance of an ambulance, or

in timely and appropriate assessment or care after transfer; for 16 of these (11 in planned freestanding midwifery unit/home births and five in an alongside midwifery unit), this was considered to be probably or almost certainly relevant to the outcome for the baby (Vignette 3, Box 2). For one woman planning birth at home, the panel identified delay in the decision to transfer, delay in the arrival of the ambulance and delay in obstetric review after arrival at the hospital. For two women, both planning birth at home, delays in transfer were considered to have occurred in part because the woman delayed or declined transfer.

Intermittent auscultation

Overall, 46 women (72%) had intermittent auscultation (IA) at some stage during labour. For over half of these

women (28 women), panels identified issues in relation to IA (Vignette 4, Box 2). In all but two of these instances, the woman was in her original planned birth setting at the time. For 19 women this was considered to be probably or almost certainly relevant to the outcome for the baby. Issues included incorrect frequency or timing of IA in relation to contractions; poor, inadequate or confusing recording of IA or the fetal heart rate; and failure or delay in recognising or acting on fetal heart rate concerns. For two women planning birth at home, IA was either not carried out at all, or with a frequency and timing that was inconsistent with national guidance, at the request of the mother.

Resuscitation and neonatal transfer

Of the 18 women who were not transferred during labour, 11 gave birth in a freestanding midwifery unit or at home, and resuscitation of the baby took place in a midwifery-led setting with no neonatal service on site. For two of these, panels identified good or excellent resuscitation care and neonatal transport, but in six, all in freestanding units, issues were identified in relation to resuscitation, management and transfer of a compromised baby; for four, this was considered to be almost certainly relevant to the outcome for the baby (Vignette 5, Box 2). Issues included uncertainty over leadership of resuscitation, with midwives deferring to paramedics or other colleagues who may have had less experience with neonatal resuscitation; apparent confusion about how to arrange transfer; and unclear communication of urgency, leading to delay. For all six there were indications of an absence of clear local guidance or protocol for the management of a neonatal emergency in the freestanding unit, leading to significant delay and/or inadequate resuscitation.

Follow up and review

A follow-up appointment between parents and health professionals took place for 49 deaths (77%) overall, but in only 13 of these (27%) was a midwife involved in the follow-up appointment.

A local review of care took place in 58 cases (91%), but only nine (16%) of these reviews were judged to be of good quality, with 28 (48%) described as 'poor' by panels. A midwife was involved in the review in 35 of the 49 deaths (71%) for which the composition of the review panel was documented.

Parent and public involvement

Our parent and public involvement ensured that topics of key importance to bereaved parents, including bereavement care, post-mortem consent and local review were central to this enquiry. Our links with charities representing bereaved parents will ensure effective dissemination.

Discussion

Main findings

In 75% of intrapartum-related perinatal deaths occurring in births planned in midwifery-led settings, improvements in care were identified that may have made a difference to the outcome for the baby. In 75% of deaths, improvements in care may also have made a difference to the mother's physical and psychological outcome or future wellbeing.

Many of the themes arising from panels' judgements about care were the same or similar to those arising from the 2015 MBRRACE-UK enquiry into intrapartum-related perinatal deaths, in which most deaths occurred in planned OU births.⁶ Several emerging themes, however, were new or of specific relevance to midwifery-led settings.

Strengths and limitations

We used an established confidential enquiry process to review systematically, for the first time, the quality of care in term intrapartum-related perinatal deaths in births planned in midwifery-led settings. Oversampling ensured sufficient representation of birth settings and types of perinatal death. Otherwise our sample was representative of all potentially eligible deaths in births planned in midwifery-led settings. Enquiry panels were multidisciplinary and included at least two midwives with experience of working in a midwifery-led setting.

The confidential enquiry process uses all available medical notes and therefore, in contrast to other investigations, which may interview staff and parents, some important contextual information may not always be available. By its nature, a confidential enquiry is retrospective, involving panel members who are aware of the outcome, critically looking for any and all issues with care, based on extant national standards and guidance. No inferences can be made about the prevalence of issues with care for births where the baby did not die. Nevertheless, improvements in care arising as a consequence of our findings have the capacity to affect all women receiving care.

Interpretation (in light of other evidence)

For women at low risk of complications, with the exception of first-time mothers planning birth at home, planning birth in a midwifery-led setting is as safe for babies as planning birth in an OU, and has benefits for women in terms of substantial reductions in medical intervention.^{17,18,21} National policy supports choice of birth setting and the expansion of midwifery-led services.^{10,11} Our findings do not call into question this body of evidence or policy direction, but highlight areas where care for women planning birth in midwifery-led settings can be improved and made even safer.

Documented evidence-based discussion with women about the risks and benefits of different settings is fundamental to the implementation of national guidance about planned place of birth.¹¹ Optimal assessment, and consideration of appropriate place of birth, is an ongoing process – during pregnancy, on admission in labour and as labour progresses – taking into account women's values and preferences.^{11,22} Panels noted some well-documented evidence-based discussions, but in over half of the deaths reviewed there was little evidence of discussion, a failure to appropriately risk assess and a lack of planning for the management of risk factors. Midwives may lack confidence in talking to women about place of birth,²³ but, with appropriate support, the quality of these discussions can be improved.²⁴ Discussion and assessment of 'risk' is complex; women's and health professionals' assessments of risk may differ, and may not fit with assumptions.^{25–29} However, common ground between women and health professionals can be found if there is openness, mutual respect and a shared commitment to an agreed care plan.^{30–33} The potential benefits of this approach have been demonstrated in one 'maternity care outside guidelines' clinic in the Netherlands.³⁴

Intermittent auscultation of the baby's heart rate is a key element of monitoring and assessment during labour, with clear national guidance about the timing and frequency of IA in the first and second stages.^{11,35} The issues with IA identified in this enquiry were similar to those identified in other similar enquiries.^{5,6} Given the widespread use of IA, and the improbability that the issues found are limited to cases where the baby died,³⁶ maternity units should consider conducting routine audits of the frequency and timing of IA in their service, and acting on the findings.³⁷

Almost three-quarters of the women in this enquiry were transferred to obstetric care. Some good care was identified in relation to transfer, but there were also significant issues with care, in transfers from all three midwifery-led settings, with delay occurring because of failures of monitoring and risk assessment, failure to recognise a developing problem, poor communication of urgency and apparent lack of resource. Similar issues have been identified in births planned in OUs where escalation of care is required;⁶ however, transfer is an intrinsic part of care in a midwifery-led setting, and something that women are particularly concerned about.³⁸ Tools such as SBAR (situation, background, assessment, recommendation) are recommended to support structured communication in handover or escalation of care;³⁹ our panels identified a number of deaths in which their use might have improved communication. 'Safety huddles' have also been recommended in similar situations.^{5,40} In London, the ambulance service, midwives and a voluntary organisation have worked together to develop structured information for use by midwives requesting urgent ambulance transfer.⁴¹ There may be benefit in such approaches being extended.

We also found issues with neonatal transfer from a community setting, with resuscitation that did not meet national standards, and other issues indicative of an absence of clear protocols for the management of a neonatal emergency.^{42,43} National guidance recommends that all birth professionals attend annual nationally accredited training in neonatal resuscitation and that all birth settings should have plans in place to enable a call for help with resuscitation, facilities for resuscitation and transfer, and emergency referral pathways.¹¹ The findings of this enquiry suggest that this guidance needs reinforcing locally.

Compared with the 2015 MBRRACE-UK enquiry, a higher proportion of deaths had improvements in care identified that may have made a difference to the mother's outcome and/or future wellbeing (75% versus 47%).⁶ This may have arisen in part because of increased fragmentation of care, with consequent failures in follow-up care and review. Most deaths were reviewed locally, but, as in other investigations and enquiries,^{5,44,45} most local reviews were judged to be of poor quality, and were hampered by the absence of health professionals with relevant skills or experience, including midwives working in midwifery-led settings, paramedics and ambulance staff, and neonatologists. Similar issues were identified in relation to follow-up appointments with parents after the death of their baby. The national Perinatal Mortality Review Tool now supports high-quality standardised local review.⁴⁶

Conclusions and recommendations

The findings of this national enquiry offer an opportunity to improve care for women considering or planning birth in midwifery-led settings, and their babies, to prevent future similar deaths. All services providing midwifery-led care should review their practice with respect to the following recommendations based on our findings:

- All women who are at low risk of complications, and others considering birth in a midwifery-led setting, should have an evidence-based discussion with a midwife and/or a doctor about the risks and benefits of different birth settings, taking into account the presence of any risk factors for complications, and their values and preferences. This discussion should be fully documented in women's notes, with evidence about safety, intervention and transfer rates, and a specific care plan for the management of any risk factors in a midwifery-led setting. Decisions about planned place of birth and any care plan should be revisited during pregnancy and at the start of labour care.
- The development of a standardised risk assessment tool should be considered, for use at the start of labour care and as labour progresses.

- Routine audit of the frequency and timing of monitoring in labour is recommended to ensure alignment with guidance. Providers of maternity care with freestanding midwifery units or supporting home birth should:
 - work with their local ambulance service to develop appropriate pathways and protocols to ensure prompt ambulance attendance and transfer in emergencies;
 - adopt standardised communication of urgency in relation to transfer, with ambulance services and the receiving hospital;
 - develop and maintain clear guidance for the management of neonatal emergencies in a community setting, including mandatory annual multidisciplinary skills and drills or in situ simulation training.

When a woman is transferred urgently for obstetric care there should be a process that ensures prompt obstetric and neonatal assessment.

When a baby dies after planned birth in a midwifery-led setting, a senior midwife with experience of providing care in a midwifery-led setting should be involved in follow-up care and the local review. In deaths that have involved ambulance transfer, reviews should also include information from paramedics and the ambulance service.

Disclosure of interests

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Contribution to authorship

JJK co-conceived the study and developed the protocol with input from ESD, SK, DT, RR, JD, MF and CB; JJK, SK, ESD and RR developed the evaluation form and checklist; ESD, SK, JJK and RR chaired enquiry panels; JD and RR facilitated enquiry panels; JD collated data; RR analysed the data with input from ESD, SK, JJK and RS; RR drafted the manuscript. All authors were involved in interpretation of data, review and revision of the manuscript and approval of the final version.

Details of ethics and other approvals

Using the Health Research Authority classification for research for England,⁴⁷ this study was classified as research not requiring NHS research ethics approval. Consent from parents was not sought. Approval to use confidential patient information without consent was obtained from the Confidentiality Advisory Group of the Health Research Authority for England and Wales (17/CAG/0017) and the

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Figure S1. Flow chart for perinatal deaths selected for confidential enquiry.

Table S1. Intrapartum stillbirth and intrapartum-related neonatal death definitions.

Table S2. Inclusion criteria in different planned birth settings.

Table S3. Grading of quality of care.

Table S4. Characteristics of potentially eligible, but not selected, and reviewed intrapartum-related perinatal deaths.

Table S5. Poorest quality of care, at each point on the care pathway, potentially affecting outcome for the baby or for the woman*. ■

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