The Regulation and Quality Improvement Authority

Northern Ireland Regional Individual Midwife-led Unit (MLU) Audit, Regional Case Audit of the RQIA Guideline for Admission to Midwife-Led Units in Northern Ireland & Case Audit of Northern Ireland Normal Labour and Birth Care Pathway within Midwife-led Units and Obstetric Units

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Case Audit of Northern Ireland Normal Labour and Birth Care Pathway within Midwife-led Units and Obstetric Units

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Background

Evidence strongly supports women who have a straightforward pregnancy to plan birth in midwife-led birth settings (MLBS), which include: Alongside Midwife-led Unit (AMU), Freestanding Midwife-led Unit (FMU) or at home (National Institute for Health and Care Excellence (NICE), 2014, 2017). Women who give birth in a Midwife-Led Unit (MLU) experience fewer interventions (including intrapartum caesarean section (CS), than those planning birth in an obstetric unit (Hodnett, 2010; Begley *et al.,* 2011; Brocklehurst *et al.,* 2011; Hollowell *et al.,* 2011; NICE, 2014, 2017). Women who plan to birth in an MLU are nearly twice as likely (higher odds in some studies) of having a normal vaginal birth than in hospital (Alliman and Philippi, 2016; Scarf *et al.,* 2018). Birth in an MLU or at home is associated with improved maternal outcomes including a reduction in severe perineal tears (Scarf *et al.,* 2018) and a reduction in the need for blood transfusion in women planning to give birth in FMU (Hollowell *et al.,* 2011). In addition, women who give birth in an MLU have a decreased incidence of: amniotomy, augmentation of labour, instrumental vaginal birth, opiate or regional analgesia and there is a reduction in the need for admission to a neonatal unit for the infant (Sandall *et al.,* 2013; Hollowell *et al.,* 2015; Alliman and Philippi, 2016; Scarf *et al.,* 2018). Women have an increased rate of establishing breastfeeding in a MLU (Hollowell *et al.,* 2011; Schroeder *et al.,* 2017) and giving birth in a MLU has the same perinatal outcomes for babies as the obstetric unit (Scarf *et al.,* 2018).

The World Health Organisation (WHO) intrapartum care guideline (2018) (click for link)
outlines an intrapartum care model for the provision of safe and a positive childbirth experience. The guideline emphasises how midwife-led units facilitate the implementation of this model, particularly, as MLUs reduce healthy pregnant women's exposure to unnecessary labour interventions (WHO, 2018). Importantly, women and their families strongly appreciated the conducive birthing environment of a midwife-led unit, as they felt cared for and valued being supported to have a

physiological labour and birth (McCourt *et al.,* 2018; Raymont *et al.,* 2019). MLUs also enable midwives to practice with more professional autonomy than they would usually find in an obstetric setting (Monk *et al.,* 2013; Hofmeyr *et al.,* 2014; Hermus *et al.,* 2015; McCourt *et al.,* 2016; Rocca-Ihenacho et al., 2021). In addition, midwife-led care has been shown to have economic cost savings (Devane *et al.,* 2010; Kenny *et al.,* 2015; Schroeder *et al.,* 2017).

It is predicted that up to 45% of all birthing women by the onset of labour will have a normal labour and birth (Sandall *et al.,* 2014), with up to 36% of these women giving birth in a midwife-led unit (Walsh *et al., 2020).* Therefore many infants, women and their families can experience the beneficial impact of midwife-led care, alongside the economic benefits for health care systems. However, McCourt *et al.,* (2014) stressed that one of the key challenges for women birthing in MLU could be '*gaining admission to a midwife-led unit in labour'*. This is supported by Walsh *et al.,* (2020) and their recent research of multiple Trust case study sites in England, which highlighted many barriers to scaling up access to MLUs, including: lack of decision-making (by Trust managers), awareness of the clinical and economic evidence, the lack of commitment by providers to embed MLUs as an essential service provision alongside their obstetric units, an absence of leadership to drive through the changes and women not being informed of the availability of midwife-led services. The Midwifery Unit Standards, whcih are endorsed by NICE, recommend to focus on ten themes and 29 standards, in order to scale up the use of MUs and to improve the quality of the service (Rocca-Ihenacho et al., 2018 and Rayment et al., 2020).

In April 2014, a Guideline Development Group was established in Northern Ireland (NI) to develop an evidence-based guideline for admission to midwife-led units and normal labour and birth care pathway. The guideline development group involved key stakeholders from maternity care service users and multidisciplinary maternity care providers. Following a detailed process of co-production (DoH, 2018) external peer review, input from the Maternity Strategy Implementation Group (MSIG), the Chair of NI Royal College of Obstetrics & Gynaecology (RCOG), obstetricians across Northern Ireland and sign off from RQIA, the RQIA '*Guideline for Admission to Midwife-Led Units (MLUs) in Northern Ireland the Northern Ireland Normal Labour and Birth Care Pathway* (click for link), *a Women/Partner/Significant other*

*Information leaflet click for link, and a Regional In Utero Transfer Proforma' (*click for link) were published in January 2016.

Since publication, a small revision and update were undertaken to the guideline and pathway in September 2018. In November 2019, an *RQIA Northern Ireland Midwife-led Care HART Referral and/or Transfer Report Form* (click for link) was developed, by the Planning a Home Birth in NI Guideline Development Group, for use when referring a woman or for transfer of a woman between midwife-led care settings. This included home birth or from midwifery led units to an obstetric unit (OU). In addition, the *Regional In Utero Transfer Proforma* (click for link) was updated in October 2019, for use when transferring women from one obstetric unit to another, or to another hospital, ICU or outside Northern Ireland.

At the beginning of 2020, there were nine MLUs, (six alongside and three freestanding which utilise the RQIA Guideline for Admission to MLUs in Northern Ireland and the Normal Labour and Birth Care Pathway (RQIA, 2016; updated 2018). Since the outbreak of COVID-19 and the subsequent decision to centralise birth settings in some Health and Social Care (HSC) Trusts in Northern Ireland, seven MLUs (six AMU & one FMU) are providing services to women and their families. It is intended that two of the FMUs temporarily closed, will reopen. This is important as centralising services to obstetric units has unintended consequences and may reduce women's access to care, result in the loss of the benefits of community-based care, and increase exposure to infection for women, families, and midwives (Rocca-Ihenacho and Alonso, 2020). The RQIA (2017) review of the Maternity Care in Northern Ireland (2012-18) strategy, recommended opening an MLU in the NHSCT to provide equality of midwife-led unit service provision and choice for women however, this has not yet been operationalised.

To assist with the continuous quality improvement of midwife-led care provision in NI, three clinical audits were undertaken from December 2019 to March 2020. 1) *Northern Ireland Regional Individual MLU Audit* which sought to collate data relating to service provision and outcomes from individual MLUs for the full calendar years 2015 and 2018. The year 2015, was chosen as the year prior to publication of the RQIA's *Guideline for Admission to Midwife-Led Units (MLUs) in Northern Ireland and*

the Northern Ireland Normal Labour and Birth Care Pathway. The year 2018 was two years post publication therefore, allowing time for implementation. 2) *Regional Case Audit of the RQIA Guideline for Admission to MLUs in Northern Ireland & Northern Ireland Normal Labour and Birth Care Pathway.* This audit sought to collate Maternal and neonatal clinical outcomes relating to the implementation of the Guideline and Pathway for a random sample of women who gave birth in all MLUs in NI in 2018 and, 3) *Audit of Normal Labour and Birth Care Pathway within an Obstetric Unit*. This was a pilot audit, of a random sample of women (who had a straightforward pregnancy) and gave birth in 2018, within one of two obstetric-led care units, where there is no designated MLU. This audit focused on the maternal and neonatal clinical outcomes relating to the utilisation of the *Northern Ireland, Normal Labour and Birth Care Pathway*, as the pathway was designed for implementation within any birth setting when caring for a woman with a straightforward pregnancy.

Qualtrics[xm] (2020) online software platform was utilised to build the audit collection tools, which were developed by the project team in collaboration with the MLU Audit Steering Group and MLU Data Collectors. The audit tools were reviewed by the expert peer reviewer, piloted and amended as required. The data was accessed primarily by a number of data collectors from NIMATS, Birth Registers (MLU and Labour ward birth registers (e.g. if a woman is transferred to a labour ward), Badgernet, NICU records and data already collated locally or by a breastfeeding coordinator. Data collectors were predominantly midwife managers from each MLU and two obstetric units, and senior midwives or Heads of Midwifery validated a sample of the case data collected.

Key Findings

Key findings are presented below, with further findings outlined within this report relating to the: *Northern Ireland Regional Individual MLU Audit; Regional Case Audit of the RQIA Guideline for Admission to MLUs in Northern Ireland & Northern Ireland Normal Labour and Birth Care Pathway* (within MLU) *and the Audit of Normal Labour and Birth Care Pathway within an Obstetric Unit.*

Key findings: <u>Northern Ireland Regional Individual MLU audit</u>

- There were no maternal or neonatal deaths in the MLUs in 2015 or 2018.
- Birth rates in MLUs across Northern Ireland have increased from 2,937 in 2015 to 3,397 in 2019. This represents an increase from 12% (2,937/24,215) (NISRA, 2020) x100) in 2015, to 15% (3,397/22,466 (NISRA, 2020) x 100) in 2019 of total births. There is still room for improvement given that the percentage of women who are predicted to have a normal labour and birth at the onset of labour is 45% (Sandall *et al., 2014*) although not all women will choose to birth in an MLU.

Maternal and neonatal clinical outcomes for 2018 are presented for **eight MLUs**, one unit opened from October - December 2018 and statistics are not included.

- Initiation of breastfeeding by women in MLUs ranged from 63% (54/86) - 90% (165/183); with an average breastfeeding initiation rate of 71% across eight MLUs.
- Breastfeeding rates on discharge home from an MLU ranged from 42% (173/410) to 61% (19/31), with average breastfeeding on discharge rate of 52% across the eight MLUs. Overall, the breastfeeding rate on discharge from an MLU was higher than those reported for women discharged home from all birth settings (48%) across NI (Public Health Agency, 2018).

- Formula feeding rates on discharge home ranged from 34% (29/86) to 67% (122/183), with an average formula feeding on discharge rate of 45% across eight MLUs (2018).
- Percentage of women who chose to mix feed their infant i.e., breast and formula feed on discharge home ranged from 3% (3/86) to 11% (32/303) (in 2018).
- The number of women who birthed in a MLU and had an episiotomy, for seven MLUs ranged, for the majority, from 0% (0/86) to 7% (20/303); one unit had an incidence of 10% (39/410).
- The incidence of a third degree tear among women in 7 of the MLUs ranged from 0.2% (1/410) – 2% (4/131); one unit recorded 6% (2/31).
- The incidence of a fourth degree tear among women who birthed in a MLU, in 2018 ranged from 0% (0/920) – 1% (1/86).
- The number of women who transferred from an MLU to an obstetric unit following birth in 2018, ranged for the majority from 15% (139/920) to 30% (26/86); with two MLUs recording a rate of 43% (97/223) to 46% (188/410). There are no additional data to confirm the percentage of those who transferred to the obstetric unit in relation to parity. There is also no information in relation to the number of women who transferred to antenatal ward or postnatal ward from MLU. A range of reasons for transfer were noted including delay in labour progress, pain relief, significant meconium and abnormal fetal heart rate. The percentage relating to each transfer rationale reported is not available, as some women may have transferred for a number of different reasons.
- In 2018, the number of babies, admitted to the Neonatal Intensive Care Unit (NICU) or the Special Care Baby Unit (SCBU) from the eight MLUs, ranged for the majority from 0% (0/303) to 2% (11/665), with one unit recording 5% (4/86). The average admission rate to NICU or SCBU from eight MLUs equalled 1% (one MLU, N/R), in 2018.
- Not recorded (NR) was noted on a number of occasions.

Key findings: <u>Regional Case Audit of the RQIA Guideline for Admission to MLUs in Northern Ireland & Northern Ireland Normal Labour and Birth Care Pathway</u>

Audit Criterion 1: The majority of women admitted to a Midwife-Led Unit should meet the RQIA (2016) criteria for admission to a MLU in Northern Ireland OR an individualised care plan should have been developed				
No	**Standard**	**Number of cases audited (n/N)**	**2018**	**Compliance Rating**
1	In the Maternity Hand Held Record (MHHR), the woman met the criteria for admission to MLU as per the RQIA guideline	335/352^	95%	≥90% G ≥70% A ≤69 R
2	An individualised care plan was developed, when the woman did not meet the RQIA admission criteria (For 3/17 women an individualised care plan was reported as not applicable)	9/14	64%	100% G ≥80% A ≤79 R

Audit Criterion 2: All women's individual birth preferences and care during each stage of the pathway should be documented in their Maternity Hand Held Record (MHHR)				
No	**Standard**	**Number of cases (n/N)**	**2018**	**Compliance Rating**
1	Labour/birth preferences recorded in the body of the MHHR or on the guideline documentation	244/352	69%	≥90% G ≥70% A ≤69 R

Audit Criterion 3: The majority of women are assessed to be in active labour on admission to the MLU, commenced on and follow the Normal Labour and Birth Care Pathway				
No	**Standard**	**Number of cases (n/N)**	**2018**	**Compliance Rating**
1	The labour assessment documentation was fully completed in case notes	220/352	63%	≥90% G ≥70% A ≤69 R
2	It was evidenced that the Normal Labour and Birth Care Pathway was commenced	219/352	62%	≥90% G ≥70% A ≤69 R
3	Full dilatation of cervix not confirmed by vaginal examination	288/350*	82%	≥90% G ≥70% A ≤69 R
4	Frequency of vaginal examination as per pathway	298/350	85%	≥90% G ≥70% A ≤69 R
5	Frequency of ARM as per pathway (includes ARM not required)	328/350	94%	≥90% G ≥70% A ≤69 R
6	All women should be in active labour prior to admission to an MLU	277/352	79%	≥90% G ≥70% A ≤69 R

Key
^ 352 case notes were randomly selected and audited, three of these had been included unintentionally as the women had not birthed in the MLU per sampling criteria – they were transferred (two in the first and one in the second stage of labour) and birthed in OU. Only related data is reported.
(* as per ^ two of the woman had been transferred in the first stage of labour, both not included)

Audit Criterion 4: What was the maternal outcome indicators related to giving birth in the MLU for the individual woman?				
No	**Standard**	**Number of cases (n/N)**	**2018**	**Compliance Rating**
1	All women have an unassisted cephalic vaginal birth/water birth	349/349**	100%	100% G ≥80% A ≤79 R
2	Mother-baby skin to skin for at least 1 hour uninterrupted following birth	124/349	36%	100% G >80% A ≤79 R
3	Initiation of Breastfeeding at birth	235/349	67%	>100% G ≥80% A ≤79 R
4	Breastfeeding on discharge home	207/349	59%	≥90% G ≥70% A ≤69 R
5	Responsive infant feeding by woman (including formula feeding)	343/349	98%	100% G ≥80% A ≤79 R
7	No Significant postnatal blood loss >500mls	337/349	97%	≥90% G ≥70% A ≤69 R
8	No Obstetric Emergency	332/349	95%	≥90% G

				≥70% A ≤69 R

Key

** As per ^ three women were transferred and birthed in OU (data are not included).

Audit Criterion 5: What was the neonatal outcome indicators related to being birthed in the MLU for the baby?				
No	**Standard**	**Number of cases (n/N)**	**2018**	**Compliance Rating**
1	Live birth	349/349	100%	100% G ≥80% A ≤79 R
2	Baby did not require additional care	299/349	86%	≥90% G ≥70% A ≤69 R
3	Delayed cord Clamping (> 1 min)	283/349	81%	≥90% G ≥70% A ≤69 R
4	APGAR at 5 minutes of 9-10	340/349	97%	≥95% G ≥70% A ≤69 R

Audit Criterion 6: All women who required transfer were offered transfer to another MLU or Obstetric Unit and rationale provided.				
No	**Standard**	**Number of cases (n/N)**	**2018**	**Compliance Rating**
1	Woman who transferred (3 women transferred intrapartum^ and 56 transferred postnatally)	Total 59/352	17%	Not applicable
2	Rationale for Transfer documented	37/59	63%	≥90% G ≥70% A ≤69 R

Key findings: Audit of Normal Labour and Birth Care Pathway within an Obstetric Unit

Audit Criterion 1: Women with a straightforward pregnancy are assessed to be in active labour on admission to the obstetric labour ward, commenced on and follow the Normal Labour and Birth Care Pathway				
No	**Standard**	**Number of cases (n/N)**	**2018**	**Compliance Rating**
1	The initial labour assessment documentation was fully completed	38/62	61%	≥90% G ≥70% A ≤69 R
2	It was evidenced that the normal labour and birth care pathway was commenced	53/62	86%	≥90% G ≥70% A ≤69 R

Audit Criterion 2: What were the maternal outcome indicators for women with a straightforward pregnancy giving birth in an obstetric labour ward following the Normal Labour and birth care pathway?				
No	**Standard**	**Number of cases (n/N)**	**2018**	**Compliance Rating**
1	Mobilisation in labour - changing position in labour	54/62	87%	≥90% G ≥70% A ≤69 R
2	Full dilatation of cervix not confirmed by vaginal examination	24/48*	50%	≥90% G ≥70% A ≤69 R

3	Frequency of vaginal examination as per pathway (includes 23% (n=11) where VE not required)	27/48	56%	≥90% G ≥70% A ≤69 R
4	Frequency of ARM as per pathway (includes ARM not required)	42/48	88%	≥90% G ≥70% A ≤69 R
5	No significant postnatal blood loss of >500mls	45/48	94%	≥90% G ≥70% A ≤69 R
6	No obstetric emergency	48/48	100%	≥90% G ≥70% A ≤69 R

Key:
* Denominator change, as four women accessed an epidural and one women had a spinal anaesthetic for caesarean section. There were nine women who used Remifentanil, and as their care deviated from Normal Labour and Birth Care Pathway, their outcomes were not reported on after Q10.

Audit Criterion 3 What was the neonatal outcome indicators related to being birthed in the obstetric labour ward for the baby using the normal labour and birth care pathway?				
No	**Standard**	**Number of cases (n/N)**	**2018**	**Compliance Rating**
1	All women have an unassisted cephalic vaginal birth/water birth	44/48**	92%	≥90% G ≥70% A ≤69 R
2	Mother-baby skin to skin for at least 1 hour uninterrupted following birth	9/48	19%	100% G >80% A ≤79 R
3	Initiation of breastfeeding at birth	28/48	58%	100% G >80% A ≤79 R
4	Breastfeeding on discharge home	25/48	52%	≥90% G ≥70% A ≤69% R
5	Responsive infant feeding by woman (including formula feeding)	48/48	100%	100% G >80% A ≤79 R

Key:
** Four women had an assisted birth either by forceps (n= 2) or vacuum (n= 2).

Audit Criterion 4 All women who require transfer to another obstetric Unit or ICU are transferred and rationale provided

None of the women in the case notes that were audited were transferred to another obstetric unit or ICU.

Key findings: <u>Outcomes from birthing in a Midwife-led Unit and Obstetric Unit</u>

Findings from these audits, report maternal and neonatal outcomes experienced by women who have had straightforward pregnancy. Evidence demonstates that birthing in an obstetric unit can lead to an unintentional increase in unnecessary interventions. The findings from this *Audit of Normal Labour and Birth Care Pathway within an Obstetric Unit* resonate with evidence from research studies (Hodnett, 2010; Begley *et al.,* 2011; Brocklehurst *et al.,* 2011; Hollowell *et al.,* 2011; NICE, 2014, 2017). The data indicates, that for women birthing in an OU with a straightforward pregnancy, can lead to the use of opiate and regional methods of pain relief (epidural and Remifentanil), an increase in vaginal examinations, artificial rupture of membranes, episiotomy, suturing and assisted (instrumental) births. In addition, the data from this audit highlights that birthing in an OU decreases the rates of optimal cord clamping, maternal/newborn skin to skin, rates of initiation of breastfeeding and breastfeeding on discharge. The improved maternal and neonatal outcomes from birthing in an MLU further emphasise the need for the immediate provision of MLUs in all Trusts across Northern Ireland.

Recommendations

1. By January 2022, commencement of a review of the current evidence and update the RQIA Guideline for Admission to Midwife-Led Units (MLUs) in Northern Ireland, the Northern Ireland Normal Labour and Birth Care Pathway and the Women/Partner/Significant other Resource Leaflet. In addition, the development of best practice guidance on individualised care planning for women who do not meet the guideline for admission to MLUs. This is essential as new evidence continues to be published.
2. There is an immediate need to raise the profile of MLUs as an evidenced based choice of place of birth for all women with a straightforward pregnancy across NI. This can continue to be actioned using all public health platforms and via maternity care providers during each maternity care contact.
3. There is also an immediate need for the outcomes and evidence relating to birthing in all birth settings to be made more accessible to women and their partners through a wider range of platforms, to inform their choice of place of birth. An MLU self-referral form should be accessible and made available to all women. Click on a link below for access to the relevant Trust self-referral form.

   https://belfasttrust.hscni.net/services/maternity/pregnancy-journey/self-referral-form/
   http://www.northerntrust.hscni.net/services/maternity-services/babyandu/
   https://setrust.hscni.net/service/maternity-2/
   https://southerntrust.hscni.net/services/maternity-services/
   https://westerntrust.hscni.net/service/maternity-services/
4. By January 2022, ensure that there are consistent categories of data collated from each MLU in relation to the care provision and maternal and neonatal outcomes. NIMATS or the proposed new regional health data system needs to be designed to enable recording of the agreed maternal and neonatal outcome data.
5. By January 2023: Where each obstetric unit is located, a midwife-led unit(s) (an alongside MLU) should be commissioned, and where appropriate an FMU; thereby providing MLU service provision for all women with a straightforward pregnancy in Northern Ireland.

6. By September 2022: All MLUs should have completed Midwifery Unit Standards Self-assessment Tool (Midwifery Unit Standards, 2019) and developed an improvement action plan. These action plans should include work force planning to optimise staffing in MLUs to ensure staff shortages in obstetric units do not normally impact on care provision in an MLU. Also that Trust wide evidence informed policies are developed, for example, that one significant other can stay with a woman in the MLU postnatally (if the woman chooses).
7. By September 2021: Establish a midwife-led unit/care network across Northern Ireland to share evidenced-based good practice and decrease variability of practice/performance across MLUs.
8. By September 2022: Explore women's experiences of birthing in MLUs in Northern Ireland, as it is important to research women's MLU care experiences.
9. By June 2023: Undertake a re-audit of the Regional Individual MLU audit, Regional Case Audit of the RQIA Guideline for Admission to Midwife-Led Units in Northern Ireland & Case Audit of Northern Ireland Normal Labour and Birth Care Pathway within Midwife-led Units and Obstetric Units.

Clinical Audit Report

Background

Evidence strongly supports healthy women who have a straightforward pregnancy to plan and give birth in midwife-led birth settings. The National Institute of Health and Care Excellence (NICE, 2017) updated intrapartum guideline continues to reiterate that these women should be given the choice to birth in any one of the four birth settings (Alongside Midwife-led Unit (AMU), Freestanding Midwife-led Unit (FMU), at home or an obstetric unit (OU). Maternal and neonatal outcomes from giving birth in a midwife-led unit (MLU) are positive, safe and as good as, if not better than in an obstetric unit (Alliman and Phillipi 2016; NICE, 2014, 2017). Women have fewer caesarean section (CS) births, a lower incidence of postpartum haemorrhage requiring intensive care and they experience less unnecessary interventions from birthing in an MLU (Begley *et al.,* 2011; Brocklehurst *et al.,* 2011; Hollowell *et al.,* 2011; NICE, 2014, 2017). These include decreased incidence of: amniotomy, augmentation of labour, instrumental vaginal birth, opiate or regional analgesia and, for the baby, there is a lower chance of admission to a neonatal unit (Sandall *et al.,* 2013; Hollowell *et al.,* 2015). Hollowell *et al.,* (2015) noted that neonatal unit admissions were substantially high in planned OU births, at term, in both 'low ' and 'higher risk' women. The resultant separation may have negative consequences for the mother and baby and be costly.

Therefore, by enabling the physiological birth process, women have nearly twice the likelihood of having a normal labour and birth in an MLU (Alliman and Philippi, 2016; Scarf *et al.,* 2018) and experience a lower incidence of perineal trauma (Alliman and Philippi, 2016). Women are more likely to establish breastfeeding (Schroeder *et al.,* 2017) and giving birth in an MLU has no significant impact on infant mortality rates which are low overall (Scarf *et al.,* 2018).

The evidence is clear, receiving midwifery care can be transformative for women, families, communities, and health-care systems (Renfrew *et al.,* 2019). A range of evidence, supports the positive impact of knowledgeable, skilled, and compassionate care that midwives provide from pregnancy to childbirth and beyond saves lives, reduces preterm birth and promotes health and well-being (Renfrew *et al.,* 2014;

Homer *et al.,* 2014; Van Lerberghe *et al.,* 2014; Sandall *et al.,* 2016). In relation to long term health and well-being, epidemiological evidence is mounting that the care provided in labour and birth and the mode of birth (in particular caesarean section) can have an epigenetic effect on the neonate's immune system, with health effects relating to non-communicable autoimmune diseases (e.g. asthma, Type 1 diabetes, infant bronchiolitis and obesity) (Downe *et al.,* 2019). Provision of midwife led units is vital in supporting physiological normal birth for not only short term but long term health and wellbeing of individuals and communities.

The World Health Organisation (WHO) strongly emphasises the importance of MLUs. Their intrapartum guideline outlines an intrapartum care model for the provision of a safe and positive childbirth experience. This guideline highlights how midwife-led birth units enable the implementation of this model, particularly, as MLUs reduce healthy pregnant women's exposure to unnecessary labour interventions (WHO, 2018). International midwifery organisations including the International Confederation of Midwives (ICM), European Midwives Association (EMA), Midwives Alliance of North America (MANA) and the Royal College of Midwives (RCM) all advocate for the provision of evidenced-based midwife-led care models for all healthy women who have had a straightforward pregnancy. Indeed, midwife-led care is recognised as the vital key to the challenges of providing high-quality maternal and newborn care globally for all women and infants (Lancet Midwifery Series, 2014; Miller *et al.,* 2016, Renfrew *et al.,* 2019. This is recently emphasised in the findings from the The State of the World Midwifery (SoWMy) report, which also called for significant investment in midwives (UNFPA/WHO/ICM, 2021). Following the Bio-psycho-social model of care (Rayment *et al.,* 2020) midwives within a MLU can practise with more professional autonomy than they would usually find in an obstetric setting (Monk *et al.,* 2013; Hermus *et al.,* 2015; McCourt *et al.,* 2016). The Bio-psycho-social model of care recognises pregnancy and childbirth as a physiological process, which has sociocultural and psychological elements (Rocca-Ihenacho *et al.,* 2021; Walsh and Newburn, 2002) and these elements cannot be disjointed in the provision of quality maternal and newborn care.

Midwife-led care has also been shown to have economic cost savings (Devane *et al.,* 2010; Kenny *et al.,* 2015; Schroeder *et al.,* 2017). Likewise, there is evidence of a

cost-saving effect for midwife-led continuity of care compared to other care models (Sandall *et al.,* 2016). Schroeder *et al.,* (2017) published the total average cost per mother-baby dyad for intrapartum care at a free-standing MLU in London was £1296.23, costing approximately £850 less than the average cost per mother and baby who received all their care at a London Hospital. Furthermore, Ryan *et al.,* (2013) suggest that if midwife-led services were expanded to 50% of all women who have a straightforward pregnancy in the United Kingdom, 1.16 million per year would be saved. This is a conservative estimate made 10 years ago, and would be undoubtedly higher if repeated today. A study in the Republic of Ireland noted that the average cost of caring for a woman allocated to the midwife-led unit was €2,598, compared to €2,780 in the consultant-led units with an average difference €182 per woman.

It is predicted that 45% of the total maternity care population will have a normal labour and birth (Sandall *et al.,* 2014) with up to 36% of these women eligible to give birth in a midwife-led unit (Walsh *et al., 2020),* therefore many infants, women and their families can experience the beneficial impact of midwife-led care. However, McCourt *et al.,* (2014) and Raymont *et al.,* (2019) stress that one of the key points for women actually birthing in MLU could be gaining admission in early labour.

Walsh *et al'.,* (2020) research of Trust case study sites in England, highlighted many barriers to scaling up access to MLUs, including: lack of decision-making (by Trust managers) awareness of the clinical and economic benefits of MLU provision as evidenced in numerous sources and the provision of midwife-led units are not given the same importance as an equal and parallel component in Trust's maternity care provision to that of obstetric unit (OU) provision. There is also an absence of leadership to drive forward these changes and there is evidence that women are not being informed of the availability of midwife-led services.

Access to a MLU has also become even more pertinent, during the current COVID-19 pandemic for healthy women who are experiencing a straightforward pregnancy (RCM/RCOG, 2020). The ICM stress that it is not just the woman's right, if she chooses to birth there (2020) but it is also an issue of safety in order to reduce the risk of the spread of infection from hospital OU settings for women, their babies, their

birth supporters and midwives skilled in midwife-led birthing (ICM 2020; MUNET 2020). Centralising birth settings to the default OU has unintended consequences including increasing women and infant's exposure to unnecessary interventions (Sandall *et al.,* 2016). The reduction of unnecessary intrapartum interventions within midwife-led birth settings not only benefits the health and wellbeing of the woman and her baby, it benefits healthcare systems by decreasing the need for a longer hospital stay, the use of unnecessary resources (Kenny *et al.,* 2015), and thereby may decrease the chance of hospital transmission of infection, including COVID-19, for women, families, and midwives (Rocca-Ihenacho and Alonso, 2020). Furthermore, centralisation of services may lead to women having reduced access to midwife-led care and diminished benefits from community-based care which can ease pressure for acute maternity settings (Rocca-Ihenacho and Alonso, 2020). Rocca-Ihenacho and Alonso (2020) highlighted the importance of expanding the use of midwife-led units both AMUs and FMUs and where possible MLUs as pop-up units can be created quickly following the example of the Netherlands. A strategic, evidence informed response, co-created with women, families and staff is required to provide high quality maternity care particularly during the COVID-19 pandemic (Renfrew *et al.,* 2020).

Guidelines / Evidence Base

The provision of midwifery services in NI has evolved in line with policy. In particular, change has been driven by the Northern Ireland Strategy for Maternity Care (2012-2018) (DHSSPS, 2012), overseen by the Maternity Strategy Implementation Group (MSIG). Terms of Reference for a Review of Maternity and Neonatal Services was approved by the Minister of Health before the pandemic. Once completed this Review will inform a new Maternity Strategy. Due to the ongoing pandemic, the Review of Maternity and Neonatal Services has not yet been able to commence. The timescale for commencing the Review remains uncertain and will depend on the ongoing COVID-19 context (DoH, correspondence Sept 2020).

Other supporting NI national healthcare policy documents include: Systems Not Structures: Changing Health and Social Care (The Bengoa Report, 2016), Health and Wellbeing 2026: Delivering Together (Minister O'Neill Report 2016) and Quality

Strategy 2020 (DoH, 2019). The Health and wellbeing 2026: Delivering together (DOH, 2016) outlined the roadmap for the integration of care in transforming the delivery of health and social care across Northern Ireland. To achieve sustainable service delivery, the Bengoa Report (Systems not Structures: DOH, 2016) recommended a focus on population health, workforce, e-health and integration. Recommendations, within the Bengoa report, clearly emphasise the need '*to aggressively scale'* up good practice where there is clear evidence of improved outcomes for service users, outside the acute setting. The provision of midwife-led units (AMU & FMU) in every Trust across NI is such an example, where midwives can practise their full range of skills, providing improved outcomes including improved care experiences, quality and satisfaction.

Development of RQIA Guideline for admission to midwife-led units in Northern Ireland and Northern Ireland Normal Labour & Birth Care Pathway

Further to the uncovering of variation in application and content of criteria used in the assessment of women planning to birth in MLUs (Healy, 2013) https://studylib.net/doc/7849697/maria-healy-report, a Guideline Development Group was set up in April 2014. The RQIA *Guideline for Admission to MLUs in Northern Ireland and Northern Ireland Normal Labour & Birth Care Pathway* were developed following a detailed process of co-production (DoH, 2018) with key stakeholders from maternity care service users and multidisciplinary maternity care providers. The Guideline and Pathway were published in January 2016 and implemented in the five Health and Social Care Trust across NI, following external peer review, input from the Maternity Strategy Implementation Group (MSIG), the Chair of NI Royal College of Obstetrics & Gynaecology (RCOG), obstetricians across Northern Ireland and sign off from RQIA.

Since publication, a small revision and update were undertaken to the guideline and pathway in September 2018. In November 2019 an *RQIA Northern Ireland Midwife-led Care HART Referral and / or Transfer Report Form* (click for link) was developed by the Planning a Home Birth in NI Guideline Development Group for use when referring or for transfer of women between midwife-led care settings, including home birth or from MLUs to OUs. In addition, the *Regional In Utero Transfer Proforma* (click

for link) was updated in October 2019 and is for use when transferring women from one OU to another, or to another hospital, ICU or outside Northern Ireland.

International Impact of Guideline

The care provision within a Midwife-led unit is specific and individual. It should also be underpinned by a philosophy of care which supports normal labour and birth. In 2018, *Midwifery Unit Standards* were published by Rocca-Ihenacho *et al., (2018)* Midwifery Unit Network (MUNet, 2018) and in partnership with the EMA and NICE in 2019. The aim of the Midwifery Unit Standards is to improve quality of maternity care, decrease variability of practices and enable a bio-psycho-social model of care (MUNet, 2018). Standard number eight, of the Midwifery Unit Standards highlights the importance of every MLU having an evidenced-based guideline for women's suitability for midwifery-led care. The RQIA Guideline for Admission to Midwife-Led Units (MLUs) in Northern Ireland and the Northern Ireland Normal Labour and Birth Care Pathway are referenced in the MUNET (2018) Standards document (RQIA/GAIN, 2016; Healy and Gillen, 2016; Healy and Gillen 2018) to substantiate this statement.

The evidenced-based guideline and pathway have been presented to international maternity care leads at the '*Asking different questions: Research priorities to improve the quality of care for every woman, every child'* symposium - World Health Organisation, Geneva, in March 2018. In addition, it has been presented at several international conferences, and in maternity healthcare settings e.g., Royal College of Midwives (2015), European Midwife Association Education Conference (2016), International Normal Birth Research Conference (2017), maternity units in Limerick and Kilkenny (2019).

Through international partnership and following the WHO forward and back translation process (WHO, 2007), senior midwives within different countries have translated the guideline, pathway and related documents, followed by the back translation process undertaken by RQIA MLU guideline leads. To date the guidelines are in the process of being translated into six including: Catalan, German, Italian,

Portuguese, Spanish and Swedish. The translated guideline will be used in lobbying for the introduction of MLU provision in different countries (e.g., presented to Portuguese Parliament in 2021) and the implementation of the guideline and pathway within different countries. An abstract has been accepted for presentation at the International Confederation of Midwives (ICM) virtual congress in Bali in June 2021. The translated guideline is due for publication in Spanish and Catalan in the forthcoming months in collaboration with Ms Anna Martin Arribas from the University of Barcelona and Dr Ramon Escuriet, Government of Catalonia, Barcelona, Spain.

Midwife-led Units in Northern Ireland

At the beginning of 2020, there were nine MLUs, (six alongside and three freestanding which utilise the RQIA Guideline for Admission to MLUs in Northern Ireland and the Normal Labour and Birth Care Pathway (RQIA, 2016; updated 2018). Since the outbreak of COVID-19 and the subsequent decision to centralise birth settings in some HSC Trusts in Northern Ireland, seven MLUs (six AMU & one FMU) are still providing services to women and their families. It is intended that two of the FMUs temporarily closed, will reopen. This is important as centralising services to OU has unintended consequences and may reduce women's access to care, loss of benefits of community-based care, and increase exposure to infection for women, families, and midwives (Rocca-Ihenacho and Alonso, 2020). The RQIA (2017) review of the Maternity Care in Northern Ireland (2012-18) strategy, recommended opening an MLU in the NHSCT to provide equality of MLU service and choice for women however, this has not yet been operationalised.

Background, Context & Vision for Future Midwifery Services

Belfast Health and Social Care Trust (BHSCT)

The Royal-Jubilee Maternity Service offers women the choice of all four birth places; homebirth, freestanding midwife-led unit (Mater Hospital), alongside midwife-led unit (Active Birth Centre/ABC) and consultant-led obstetric unit.

The ABC was fully established as an alongside MLU located adjacent to the obstetric unit in October 2018. The unit has four birthing rooms named as: Sanctuary, Serenity, Harmony and Haven. Each room has an en suite shower room and one has a fixed birthing pool. The ABC in the new maternity hospital (due to open in 2021) will offer 10 birthing rooms, all with birthing pools.

Weronika and Baby Lucy

The Mater FMU opened in 2013. It has four en suite birthing rooms including three with birthing pools. In 2019, 299 women gave birth in the Mater MLU and 513 in the ABC and women have awarded 4-5-star ratings for the environment and birth experience. Overall, the Trust has a 16% midwife-led birth rate (AMU and FMU combined). The ABC AMU celebrated the promotion of best practice in involvement, co-production and partnership working during the Public Health Agency Involve Fest week and facilitated a workshop at the Conference in 2019. It is showcased on the 'Engage' website as an innovative example of Public Patient Involvement (PPI) in

practice and is a shortlisted finalist at the Health Service Journal Patient Safety Awards 2020, Service User Engagement Category.

The Mater FMU celebrated winning the Best Birth Centre in the NI Positive Birth Awards, 2019 and featured in the Film 'Lost Lives', premiered at BFI London Film Festival, 2019. (Information provided by S/M Roisin Cosgrove and colleagues).

Woman Kathryn Campbell, Baby Campbell & Sister Vicky Thompson

The Mater FMU

Northern Health and Social Care Trust (NHSCT)

Maternity services in NHSCT do not currently have either an alongside midwifery led unit or a freestanding unit. However, the NHSCT maternity team provide excellent midwifery led pathways in the community setting and utilise their birthing pool rooms in both Antrim and Causeway sites.

Antrim birthing pool room
S/M Sorcha Gribben & S/M Emma McGaw

Causeway birthing pool room

Over the last decade, NHSCT has developed an excellent home birth service in order to provide women choice in relation to their place of birth. The community midwifery team has provided care for over 20 women in 2019 and continue to provide this service during 2020. Our outcomes for homebirth are excellent and we are proud of the community midwifery team's achievements.

2019 statistics for home births provided by community midwives across the NHSCT

During 2020, the midwifery team in NHSCT have worked hard to develop a continuity of care team called the "Lotus Team". This philosophy of care is in keeping with the new midwifery standards of care (NMC, 2020) and reflects the most current evidence in relation to women centred practice. This model of continuity and the relationship between care giver and receiver has been evidenced and leads to improved outcomes and safety for the woman and baby, as well as offering a more positive and personal experience. This model puts the needs of the woman, her baby and family at the heart of care, with midwives supported to provide high quality care, which is continuously improving. At the heart of this vision is the ambition that women should have continuity of carer throughout their maternity journey - before, during and after the birth. This service launched in September 2020 and initial feedback and outcomes are excellent. Co-produced evidenced-based RQIA guidelines for planning birth at home in Northern Ireland were published in November 2019 (Gillen and Healy, 2019).

NHSCT continue to explore the establishment of a midwife-led unit and the vision remains that this will become a reality in the near future. The midwifery team continue to explore innovative and alternative ways to ensure women and their families are enabled and empowered to have a positive birth experience within the

maternity service. (Information provided by Consultant Midwife Shona Hamilton and colleagues).

Southern Health and Social Care Trust (SHSCT)

There are two alongside midwife-led units in the Southern Health and Social Care Trust, in Craigavon Area Hospital and at Daisy Hill Area Hospital. Craigavon Area Hospital MLU opened in July 2000 and was the first ‘Alongside’ Midwifery Unit in Northern Ireland. A group of midwives and service users identified the need for healthy women with a straightforward pregnancy to be cared for away from the busy obstetric unit, they developed a business plan and subsequently the maternity ward “2 East” was refurbished and designated a midwife-led unit. The unit was designed

with nine birthing rooms including one with a birthing pool. It was commissioned for 900 births per year and averages around 60 births each month.

Waterbirths have always been offered as part of the MLU service. In addition, women can use the en suite baths for pain relief in labour. The midwives from the MLU were supported in developing their waterbirth knowledge by Ms Diane Garland and hosted the first waterbirth Study Day in Northern Ireland. Currently, the MLU midwives support their community colleagues by attending waterbirths on an 'on call' basis.
The service developed to offer active birth classes and antenatal care to low risk women. Currently, aromatherapy and acupuncture are offered to pregnant women and it is hoped that this service will develop further. Many of the midwives undertake examination of the newborn to facilitate early discharge home and continuing care by the community midwife. The Craigavon MLU contributes data to the UKMidSS national study system. (Information provided by Sr McClurg and S/M Andrea Prichard).

Sister McClurg and S/M Prichard at the entrance to Craigavon MLU

Birthing room in Craigavon MLU

The Daisy Hill AMU opened on 27th January 2015. The unit is based on the maternity ward with two fully furnished rooms both with pools. The unit was averaging 18 to 20 births per

month pre COVID but unfortunately, the numbers have decreased from March 2020. Our vision for the future is to increase our birth rate to 30 per month.
(Information provided by S/M Joanne McGlade and colleagues)

Daisy Hill MLU

South Eastern Health and Social Care Trust (SEHSCT)

There are three midwifery led units in the South Eastern Health and Social Care Trust (SEHSCT), one AMU and two FMU. All the MLUs provide respectful, evidence based, skilled care that supports women during normal physiological labour, birth and the transition to parenthood. The emphasis is on a safe, positive birthing experience within a relaxed atmosphere, affording freedom of movement to adopt upright positions with the option of water for labour and birth. The birthing rooms each have a birthing pool and a sofa bed for birth partners to stay overnight.

Mala Naidoo, Darren Raffo and baby Vanna in Home from Home (AMU)

Ann Kelly Maternity Care Assistant with parents in Home From Home (AMU)

The midwives have a wealth of experience in providing continuous labour support for women, reducing maternal anxiety and stress hormones. The midwives are experts in physiological birth and their knowledge and experience of alternative coping mechanisms for labour and birth have resulted in a reduction in the need for pharmacological analgesia, less interventions and a more positive birthing experience.

Staff Midwife - Lindsay Wright in Home from Home (AMU)

The MLU midwives collaborate and cooperate with colleagues in the obstetric unit to provide well-integrated pathways of care placing women first. The units have been consistently supported by midwifery and medical management. The units have contributed data to the UKMidSS national study system. Reflective skills and the sharing of best practice are encouraged. Midwives audit the birth outcomes of all women who attend the midwifery led units and share this information at interdisciplinary training. Midwives have also trained in Examination of the Newborn, Sterile Water Injections, Robozo techniques, Reflexology and Hypnobirthing. Hypnobirthing classes and Active Birth Workshops are offered to prepare women and their birth partners to be active participants in their own births.

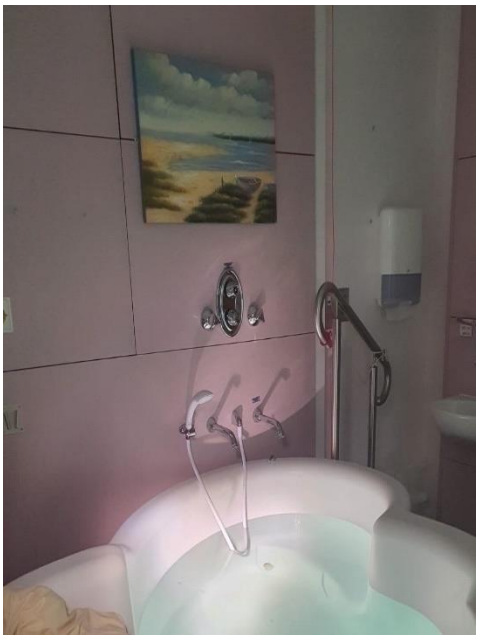
In addition to the integrated care provided in the two free standing units, the community midwifery service continues to provide care and support to women who choose to birth at home and the Home from Home (Alongside MLU at Ulster Hospital) midwives are now providing the Early Intervention Transformation Programme (EITP). With the implementation of this service women can have family focused continuity of care throughout pregnancy, birth and the transition to parenthood. To improve service provision there are plans to extend this service.

Looking to the future SEHSCT wish to keep midwifery practice rooted in normality, striving to ensure our midwives are the lead professionals in the universal care of all women and the key co-ordinators of care for women with additional needs. The appointment of a consultant midwife this year will support this strategy. Midwives have a vital contribution to public health and the development of the community maternity hub within SEHSCT will enable midwives to have a proactive preventative approach to health and readiness for pregnancy and birth provided in the primary care setting.

(Information provided by S/M Katherine Robinson, S/M Maureen Ritchie and colleagues).

Western Health and Social Care Trust (WHSCT)

There are two alongside midwife-led units in the Western Health and Social Care Trust; AMU at Altnagelvin Area Hospital and AMU at South West Acute Hospital (SWAH).



Altnagelvin AMU

The AMU in Altnagelvin Area Hospital was established in January 2010. The MLU is committed to meeting the needs of low risk women in the promotion of normality, through robust RQIA guidelines and in conjunction with the service users and lead professional. The MLU is comprised of seven individual rooms where woman can be facilitated for labour, birth and to room-in with their infants prior to discharge home in the postnatal period. There are two ensuite birthing pools adjoined to the rooms that women can avail of in labour and birth. All Midwives within MLU are trained in the practice of waterbirth and have additional skills such as hypnobirthing, reflexology and aromatherapy to complement their midwifery skills. To date Altnagelvin MLU has welcomed the birth of 4507 babies with no intervention; of these, 705 babies were delivered in our birthing pools.

Looking to the future we are working to re-establish our service user group for Maternity Services and work collaboratively to promote positive birthing for all who use our services.

The midwife-led unit in South West Acute Hospital (SWAH) was first established in 2008 in the old Erne Hospital with allocation of a small room within the delivery suite

for this purpose. A collapsible birthing pool was purchased along with liners and a pump to empty the pool. Beanbags and birthing balls were also purchased and the room was decorated in a homely manner. These were humble beginnings to the introduction of midwifery led care and the commitment to meeting the needs of low risk women and promoting normality.

In 2012 the South West Acute Hospital was opened with a six bedded MLU. This comprises of six birthing rooms, two of which have birthing pools. Midwives rotate to MLU and follow the RQIA guideline for admission and normal labour and birth care pathway. The midwives are trained in facilitating waterbirths, examination of the newborn while some have additional training in hypnobirthing, reflexology, aromatherapy and acupressure which complement their midwifery skills.
In the future, the SWAH team hope to implement a postdates clinic using complementary therapies and they are currently assessing the views of service users regarding this with a view to extending this service to high risk women in order to promote a positive birthing experience for all women.

(Information provided by Midwife Managers Leanne Hughes, Donna Blake and colleagues).

SM Ciara Cooney and SM Emma Jane Fallis at the SWAH MLU

South West Acute AMU

Clinical Audits

To promote continuous quality improvement of midwife-led care provision in NI, three clinical audits were undertaken from December 2019 to March 2020. These included: 1) A regional individual Midwife-led unit audit which sought to collate data relating to service provision and outcomes from individual MLUs for the full calendar years 2015 and 2018; 2) A regional RQIA audit of the maternal and neonatal clinical outcomes relating to the implementation of the Guideline and Pathway for women who gave birth in all MLUs in NI in 2018. 3) A pilot audit, of women (who had a straightforward pregnancy) and gave birth in 2018 within one of two obstetric-led care units, where

there is no designated MLU. This audit focused on the maternal and neonatal clinical outcomes relating to the utilisation of the *Northern Ireland, Normal Labour and Birth Care Pathway*, as the pathway was designed for implementation within any birth setting when caring for a woman with a straightforward pregnancy.

This audit of the maternal and neonatal clinical outcomes relating to the implementation of the Guideline and Pathway was integral to ensuring continuous quality improvement of midwife-led care provision in NI.

Aims and Objectives

The aim of the Audit was to determine the current implementation and usage of the RQIA Guideline for Admission to midwife-led units across Northern Ireland, along with the utilisation of the Normal Labour and Birth Care Pathway and related maternal and neonatal outcomes.

The objectives of the Audit include:

- To ascertain how the Guideline for Admission to MLUs in Northern Ireland is being implemented
- To determine how the Normal Labour and Birth Care Pathway is being utilised in the care of women who have a straightforward pregnancy within MLUs and as a pilot within two OUs
- To report the maternal and neonatal outcomes related to the implementation and utilisation of the Guideline and Pathway
- To make recommendations and develop an action plan for further development of the guideline and pathway to support the continuous improvement of MLU care provision and the care of women who have had a straightforward pregnancy and choose to give birth in an obstetric unit.

Projected Outcomes

Undertaking this audit and reporting the maternal and neonatal clinical outcomes relating to the implementation of the guideline and pathway will provide evidence to support the continued development of MLU services. This evidence will be used to inform and enable more women and their babies to experience the short and long-term health and social care benefits (including positive childbirth

experiences) of giving birth in an MLU. It is projected that further implementation of the evidenced-based Normal Labour and Birth Care Pathway will be realised for all women with a straightforward pregnancy, no matter where they decide to give birth. Potential modifications, improvement and up-dating of the guideline, pathway and related documentation may be identified. In addition, recommendations and an action plan for further development of the guideline and pathway will support the continuous improvement of MLU care provision and care of women who have had a straightforward pregnancy and choose to give birth in an OU.

Methodology

This regional, criterion based, clinical audit was undertaken following the RQIA cyclical process, known as the '*5 Stages of Audit'.* Each stage of the clinical audit cycle must be undertaken to ensure that an audit is systematic. The 5 Stages of Audit are:

Stage 1 – Preparing for audit: The reason for undertaking the audit was to determine the current implementation and usage of the Guideline for Admission to Midwife-led Units across NI, and the Normal Labour and Birth Care Pathway. There was a need to audit maternal and neonatal outcomes relating to the utilisation of the Guideline and Pathway and to identify aspects of the Guideline and Pathway which require modification, improvement and up-dating. A MLU Audit Steering Group and Data Collectors Group was set up. Members included the Heads of Midwifery from each HSC Trust or their representatives, two consultant midwives, midwife managers/senior midwives, the midwifery consultant from the PHA, a maternity care user's representative, a representative from Northern Ireland Practice and Education Council for Nursing and Midwifery (NIPEC), obstetricians and midwifery academics. The first meeting was held on the 22nd August 2019. There were a total of seven face to face/virtual meetings. In addition, there were numerous online and telephone communications with stakeholders and between the project team.

Stage 2 – Selecting Criteria: Each criterion was carefully written in the form of a statement which described the level of care to be achieved. For example: Audit 2 - Criterion 1 stated: *The majority of women admitted to a Midwife-Led Unit should*

meet the RQIA (2016) criteria for admission to an MLU in Northern Ireland or an individualised care plan should have been developed. For each criterion standards were determined by the evidence and in partnership with the clinical audit stakeholders following discussion and consensus.

Stage 3 – Measuring Performance: Following data analysis, outcomes in relation to the criterion and standards were discussed with the clinical audit stakeholders to reach consensus on the current compliance rating. Traffic light colours were used as a coding system to identify, the level of compliance, known as a 'RAG rating' - Red, Amber, Green (Red – not yet achieved compliance, Amber – moving towards compliance & Green - meeting compliance).

Stage 4 - Making Improvements: From the analysis of the audit findings, key recommendations were determined and outlined in an action plan and shared with the appropriate stakeholders.

Stage 5 – Sustaining Improvement & Re-Audit: Re-auditing will be essential to investigate if recommendations have been implemented. The timing of this will be determined by the availability of funding.

Audit Tools

Qualtrics[xm] was utilised to develop and build the three audit collection tools. The online data collection tools were completed by the data collectors. The School of Nursing and Midwifery, Queen's University Belfast purchased the Qualtrics[xm] licence and Ulster University provided access to Qualtrics[xm] to develop and analyse the survey. The three audit collection tools were entitled: *RQIA Individual MLU AUDIT; Regional Case Audit of the RQIA Guideline for Admission to MLUs in Northern Ireland & Northern Ireland Normal Labour and Birth Care Pathway; Audit of Normal Labour and Birth Care Pathway within obstetric units*. The audit tools underwent several iterations following the process of co-production (DoH, 2018) and were developed by the project team in collaboration with the MLU Audit Steering Group (which included members of the maternity multidisciplinary team and maternity care users) and MLU Data Collectors Group. The audit tools were reviewed by the expert

peer reviewer piloted on two maternal and infant case notes per MLU and amended as required.

Data Collectors Group

Data collectors were predominantly midwife managers and/or senior midwives from each MLU and two OBs. In total, 15 data collectors participated in the data collection and attended the audit meetings. Training was provided for the data collectors on the 24th October 2019 to enable them to input data initially as a pilot, from two case notes from women who gave birth in 2018 onto the online audit tools (for No.2 & No. 3 audits as applicable). The data collectors training also focused on inputting the data for No. 1 Audit - the RQIA Individual MLU Audit for the years 2015 and 2018. Following data analysis and discussion the audit tools were amended as appropriate.

On completion of data collection, Heads of Midwifery or senior midwives from each Health and Social Care Trust validated a sample of the data collected, by undertaking data cleansing.

Sampling

For **Audit 1,** data pertaining to the individual MLU for the years 2015 (prior to publication of the guideline and pathway) and 2018 (post publication) was derived primarily from NIMATS, Birth Registers (MLU and Labour ward birth registers), Badgernet, NICU Records, or already collated local data by senior midwives or from the breastfeeding coordinator.

For **Audit 2**, The case notes of a random sample of women who gave birth between 1st January and 31st December 2018, in each Midwife-led Unit in Northern Ireland were identified from identified from NIMATS (via the NIMATS managers) or MLU Birth Register.

Initially, it was the intention to randomly select the case notes of women who were admitted to the MLU, to examine their related maternal and neonatal outcomes. However, this retrospective approach proved difficult, as the maternity record system could not accurately identify these women; future audits may be able to follow this approach, as a new maternity record system is implemented. Case notes of women

who gave birth in the MLUs were therefore selected, with data from three case notes of women who gave birth in an obstetric unit following transfer, being inadvertently inputted into the Qualtrics^{xm} audit tool. This equated to 352 case notes being audited. Relevant data was subsequently excluded, as presented in the findings below.

A random selection of the required sample size (proportionate to the birth rate) per MLU was undertaken (as detailed below). The actual case notes were then requested from medical records or accessed by HSC Trust specific arrangements. If the case notes were not available, the next case note from that same month was selected. Each data collector kept their own individual list of the audited case notes in a secure location, separate to a list of corresponding '*identifiers*'. This process allowed for efficient cross-referencing which was imperative for the data cleansing process and ensured confidentiality was maintained.

The sample size calculation for Audit 2 was identified using the Raosoft calculator, resulting in the total sample size of 350 Regional MLU case notes required, to be audited in relation to the utilisation of the *RQIA guideline for admission to midwife led units in Northern Ireland and the Northern Ireland normal labour and birth care pathway*. This was calculated on the number of births in MLUs in 2014, which was 2,960 (RQIA, 2016 updated 2018) and an estimated 3,500 births for 2018 (regional birth rates for MLU were not available), with an overall birth rate of 22,829 (NISRA, 2019). The sample size of the case notes audited per MLU, was also proportionate to the birth rate in each unit.

Audit 3 – The purpose of this audit was to explore the implementation of the *Northern Ireland Normal Labour and Birth Care Pathway* within an obstetric unit and report on the related maternal and neonatal outcomes. The pathway was designed to be utilised within all birth settings, for women who had a straightforward pregnancy. A random sample of women who had a straightforward pregnancy, and gave birth within one of the two obstetric-led care units (with no designated MLU), in 2018, were selected.

This audit was undertaken as a pilot, to develop and test the audit tool and collect baseline data to explore the utilisation of *Northern Ireland Normal Labour and Birth*

Care Pathway for women who had a straightforward pregnancy and gave birth in an obstetric unit. It is intended that this tool will be used in a future regional audit of the pathway within obstetric-led settings in Northern Ireland. Evidence from Sandall *et al*., (2014) indicate that 45% of the total maternity care population will have a normal labour and birth, with 36% (Walsh *et al*., 2020) of this group eligible to give birth in MLU, thereby having had straightforward pregnancy their intrapartum care should follow the normal labour and birth care pathway.

This sample size was also identified using the Raosoft calculator. The calculation used the 2018 regional NI birth rate 22,829 (NISRA, 2019) of which 3,500 births were estimated to have been within an MLU. Within obstetric units across NI there were approximately 19,329 births, of which 36% equated to a population size of 6,958. The Raosoft calculator gave a sample size of 350.

The sample size of case notes per obstetric unit selected, were proportionate to the birth rate in each unit; calculated at 16 and 51 per obstetric unit. In total, the data from 62 randomly selected case notes were inputted, with findings relating to 48 case notes reported. Fourteen women had accessed either an epidural, spinal or Remifentanil infusion (patient-controlled analgesia). These case notes were excluded from the audit findings as the hormonal and neuro-hormonal processes of physiological labour and birth are disrupted by these analgesics (Buckley and Uvnäs Moberg, 2019).

The sample were also identified initially from NIMATS (via the NIMATS managers) or obstetric unit Birth Register. A random selection of the required sample size per obstetric unit was undertaken (as outlined above). The list of case notes was then requested from medical records, if the case notes were not available the next case note from that same month was selected. Again, each data collector kept their own individual list of the audited case notes in a secure location, separate to a list of corresponding '*identifiers*'. As highlighted, this process allowed for efficient cross referencing and ensured confidentiality was maintained which was imperative for the data cleansing process.

Data Analysis

Data was analysed within the Qualtrics^{xm} (2020) platform and also downloaded and analysed within MS Excel. Data analysis was validated by each member of the project team and discussed with MLU Audit stakeholders. Any issues of clarity relating to data were raised with the MLU data collectors in the relevant HSC Trust, who checked the raw data and advised accordingly. Data presented in this report have been rounded up to whole numbers, as required.

Report writing was undertaken by the project team, reviewed by the Steering group and the external reviewer. HSC Trust colleagues provided up to date information on MLU/obstetric unit context, current and future service provision, as appropriate. The audit report will be disseminated via the RQIA website, relevant conferences and publication.

Caveats

The ABC MLUs opened in October 2018 and therefore data is not available for 2015 and only from October to December 2018. The number of case notes audited was calculated accordingly.

From March 2020, the COVID-19 pandemic caused considerable disruption to the data collection and analysis due to increased workload and redeployment of the clinical and academic teams. However, the project continued to be progressed and finalised.

It was apparent during data collection that there was not just one source where maternity care data is stored. While the MLU Data Collectors were highly knowledgeable about where the data could be sourced, it did require additional expertise, resources and time. There are plans for a regional health data system which may alleviate these challenges.

Limitations

It was the intention from the outset, to access a retrospective random sample of case

notes of women who were admitted to the MLU, to examine their related maternal and neonatal outcomes. This proved difficult as the maternity record system could not accurately identify these women; future audits may be able to follow this approach, if a new maternity record system is implemented. Case notes of women who gave birth in the MLUs were therefore selected.

Main Findings

Findings: Northern Ireland Individual MLU Audit

Q 1. MLU policies: Does the Trust policy include the following options?

All but two of the MLUs facilitate overnight stay for the significant other as per Trust policy. During labour all the MLUs facilitated the presence of more than one birth partner and the provision of light diet and hydration.

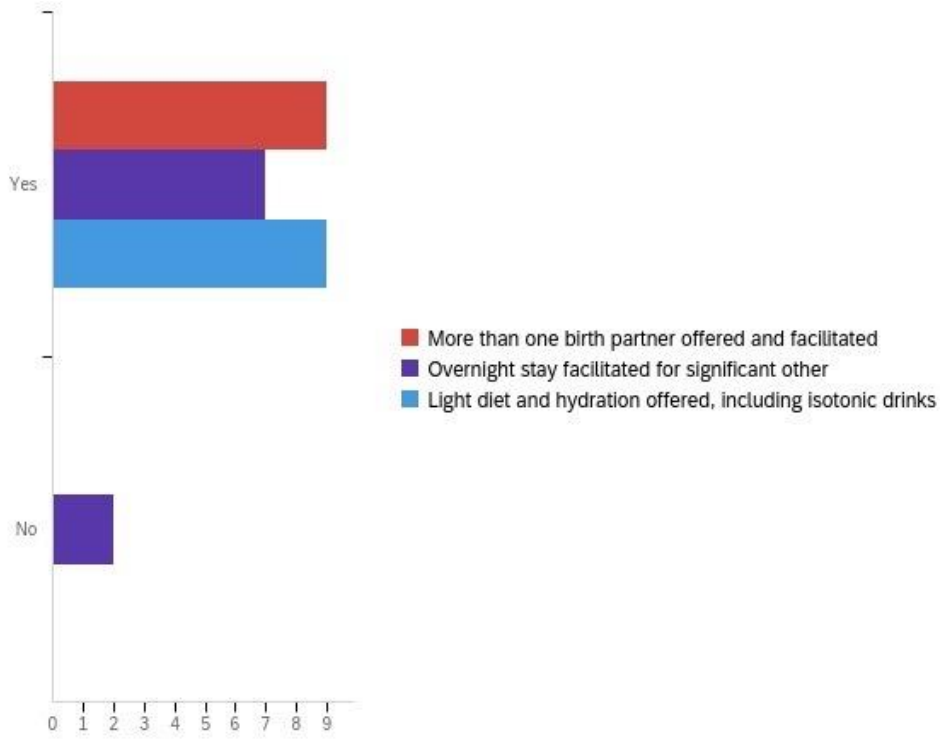


Figure No. 1: MLU Trust policies relating to 9 MLUs

Q 2. Birth Rates in MLUs for 2015, 2018 & 2019

Birth rates were collated from 1st January – to 31st December for the years 2015, 2018 and 2019. 2015 birth rates relate to the year immediately previous to the publication of the *RQIA guideline for admission to midwife-led units in Northern Ireland and the Northern Ireland Normal Labour and Birth Care pathway (2016)*. The 2018 birth rates are two years following publication of the guideline and pathway and the 2019 birth rates provide the most up to date data on birth rates in MLUs.

Findings: RQIA Individual MLU Audit

Table No. 1: Number of Births in MLUs 2015, 2018 and 2019

Midwife-led Unit name	2015	2018	2019
Home from Home	981	920	974
Lagan Valley Hospital MLU	198	86	112
Downe	82	31	10
Craigavon Area Hospital MLU	724	665	651
Daisy Hill Hospital (DHH MLU)	77	223	240
South West Acute Hospital (SWAH MLU)	217	183	235
Altnagelvin Hospital MLU	471	410	363
Active Birth Centre RJMS	MLU not open	131 (Oct – Dec 2018)	513
BHSCT Mater MLU	187	303	299
Total of births per year	2,937	2952	3,397

Q 3. MLU data regarding infant feeding from 1st January to 31st December for 2015 & 2018 Table No. 2

Midwife-led Unit name N/R = Not Recorded	**No. of women who chose to initiate breast feeding**		**No. of women who chose to breast feed their baby on discharge**		**No. of women who chose to formula feed their baby on discharge**		**No. of women who chose mixed feeding i.e. breast and formula feeding their baby on discharge home**	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	673/981 (69%)	631/920 (69%)	548/981 (56%)	504/920 (55%)	374/981 (38%)	340/920 (37%)	35/981 (4%)	46/920 (5%)
Lagan Valley Hospital FMU	115/198 (58%)	54/86 (63%)	98/198 (49%)	43/86 (50%)	76/198 (38%0	29/86 (34%)	5/198 (3%)	3/86 (3%)
Downe FMU	43/82 (52%)	22/31 (71%)	38/82 (46%)	19/31 (61%)	29/82 (35%)	11/31 (35%)	1/82 (1%)	1/31 (3%)
Craigavon Area Hospital AMU	478/724 (66%)	440/665 (66%)	403/724 (56%)	336/665 (51%)	299/724 (41%)	295/665 (44%)	22/724 (3%)	54/665 (8%)
Daisy Hill Hospital (DHH) AMU	46/77 (60%)	160/223 (72%)	NR	118/223 (53%)	NR	107/223 (48%)	NR	11/223 (5%)
South West Acute Hospital (SWAH) AMU	151/217 (70%)	165/183 (90%)	109/217 (50%)	98/183 (53%)	108/217 (50%)	122/183 (67%)	2/217 (1%)	16/183 (9%)
Altnagelvin Hospital AMU	292/471 (62%)	272/410 (66%)	164/471 (35%)	173/410 (42%)	306/471 (65%)	233/410 (57%)	NR	NR
Active Birth Centre RJMS (AMU opened from Oct-Dec 2018)	MLU Not open in 2015	N/R	MLU Not open in 2015	N/R	MLU Not open in 2015	N/R	MLU Not open in 2015	N/R
BHSCT Mater FMU	95/187 (51%)	206/303 (68%)	77/187 (41%)	157/303 (52%)	106/187 (57%)	112/303 (37%)	4/187 (2%)	32/303 (11%)
Average % rate		71%		52%		45%		

Q 4. MLU data regarding mode of care for third stage of labour and perineal trauma from 1st January to 31st December for 2015 & 2018

Number of primips and multips for 2015 & 2018 data not available, therefore it is not possible to present the related percentages. **Table No. 3**

Midwife-led Unit name N/R = Not Recorded	**Number of women who had physiological 3rd stage of labour**		**Number of women who had intact perineum / grazes: Primips**		**Number of women who had intact perineum / grazes: Multips**		**Number of women who had urethral / clitoral / labial tear**		**Vaginal Lacerations**	
Year	**2015**	**2018**	**2015 N Unavail-able**	**2018 N Unavail-able**	**2015 N Unavail-able**	**2018 N Unavail-able**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	56/981 (6%)	19/920 (2%)	34	22	186	175	N/R	N/R	N/R	N/R
Lagan Valley Hospital FMU	17/198 (9%)	8/86 (9%)	18	14	99	44	6/198 (3%)	3/86 (3%)	7/198 (4%)	9/86 (10%)
Downe FMU	13/82 (16%)	5/31 (16%)	5	1	30	10	N/R	N/R	N/R	N/R
Craigavon Area Hospital AMU	110/724 (15%)	N/R	50	68	302	355	36/724 95%)	67/665 (10%)	68/724 (9%)	48/665 (7%)
Daisy Hill Hospital (DHH) AMU	6/77 (8%)	131/223 (59%)	5	17	30	78	13/77 (17%)	29/223 (13%)	3/77 (4%)	9/223 (4%)
South West Acute Hospital (SWAH) AMU	27/217 (12%)	11/183 (6%)	11	13	95	90	16/217 (7%)	7/183 (4%)	N/R	N/R
Altnagelvin Hospital AMU	242/471 (51%)	168/410 (41%)	25	11	122	129	76/471 (16%)	84/410 (20%)	7/471 (1%)	4/410 (0.9%)
Active Birth Centre RJMS (AMU not opened in 2015, opened from Oct-Dec 2018)	MLU Not open in 2015	2/131 (2%)	MLU Not open in 2015	5	MLU Not open in 2015	34	MLU Not open in 2015	13/131 (10%)	MLU Not open in 2015	4/131 (3%)
BHSCT Mater FMU	63/187 (34%)	15/303 (0.5%)	9	8	52	68	8/187 (4%)	30/303 (10%)	13/187 (7%)	24/303 (0.8%)

Q 5. MLU data regarding Perineal Trauma from 1st January to 31st December for 2015 & 2018 Table No. 4

Midwife-	**Number of**		**Number of**	**Number of**		**Number of**

led Unit name N/R = Not Recorded	women who experienced first degree tear		Number of women who experienced second degree tear		women who had third degree tear		women who started labour in MLU & had an episiotomy		Number of women who had third degree tear in water N=unavailable		women who had fourth degree tear	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	N/R	N/R	434/981 (44%)	459/920 (50%)	13/981 (1%)	19/920 (2%)	25/981 (3%)	21/920 (2%)	0	4	1/981 (0.1%)	0/920 (0%)
Lagan Valley Hospital FMU	39/198 (20%)	15/86 (17%)	41/198 (21%)	18/86 (21%)	2/198 (1%)	1/86 (1%)	2/198 (1%)	0/86 (0%)	0	0	0/198 (0%)	1/86 (1%)
Downe FMU	22/82 (27%)	13/31 (42%)	20/82 (24%)	4/31 (13%)	1/82 (1%)	2/31 (6%)	0/82 (0%)	0/31 (0%)	0	0	0/82 (0%)	0/31 (0%)
Craigavon Area Hospital AMU	164/724 (23%)	89/665 (12%)	137/724 (19%)	174/665 (26%)	11/724 (2%)	2/665 (0.3%)	27/724 (4%)	13/665 (2%)	0	0	0/724 (0%)	1/665 (0.2%)
Daisy Hill Hospital (DHH) AMU	12/77 (16%)	44/223 (20%)	23/77 (30%)	59/223 (26%)	2/77 (3%)	5/223 (2%)	4/77 (5%)	6/223 (3%)	0	3	0/77 (0%)	0/223 (0%)
South West Acute Hospital (SWAH) AMU	31/217 (14%)	32/183 (17%)	100/217 (46%)	100/183 (55%)	3/217 (1%)	2/183 (1%)	N/R	13/183 (7%)	0	1	0/217 (0%)	0/183 (0%)
Altnagelvin Hospital AMU	42/471 (9%)	27/410 (7%)	193/471 (41%)	202/410 (49%)	10/471 (2%)	1/410 (0.2%)	15/471 (3%)	39/410 (10%)	2	1	2/471 (0.4%)	0/410 (0%)
Active Birth Centre RJMS AMU (opened from Oct-Dec 2018)	MLU Not open in 2015	21/131 (16%)	MLU Not open in 2015	27/131 (21%)	MLU Not open in 2015	4/131 (3%)	MLU Not open in 2015	23/131 (18%)	MLU Not open in 2015	2	MLU Not open in 2015	0/131 (0%)
BHSCT Mater FMU	14/187 (7%)	31/303 (10%)	58/187 (31%)	113/303 (37%)	2/187 (1%)	3/303 (1%)	12/187 (6%)	20/303 (7%)	N/R	N/R	0/187 (0%)	0/303 (0%)

Q 6. Maternal Outcomes – Instrumental delivery in MLU

No instrumental births were recorded in any MLU.

Q 7. Women Transferred from MLU to obstetric unit & Rationale for Transfers from MLU Table No. 5

Midwife-led Unit name N/R = Not Recorded	Number of Women who Transferred from MLU to obstetric unit		Pain relief		Delay in labour progress		Non-significant meconium		Significant meconium		Undiagnosed breech	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	131/981 (13%)	139/920 (15%)	15	6	63	32	N/R	N/R	28	37	N/R	N/R
Lagan Valley Hospital FMU	28/198 (14%)	26/86 (30%)	1	2	5	9	N/R	N/R	3	5	0	0
Downe FMU	10/82 (12%	6/31 (19%)	N/R	N/R	1	N/R	N/R	N/R	6	2	N/R	N/R
Craigavon Area Hospital AMU	251/724 (35%)	180/665 (27%)	9	1	128	97	N/R	N/R	26	25	0	3
Daisy Hill Hospital (DHH) AMU	N/R	97/223 (43%)	N/R	7	N/R	40	N/R	18	N/R	0	N/R	1
South West Acute Hospital (SWAH) AMU	76/217 (35%)	36/183 (20%)	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Altnagelvin Hospital AMU	158/471 (34%)	188/410 (46%)	N/R	22	N/R	52	N/R	0	N/R	12	N/R	0
Active Birth Centre RJMS AMU (opened from Oct-Dec 2018)	MLU Not open in 2015	36/131 (27%)	MLU Not open in 2015	4	MLU Not open in 2015	16	MLU Not open in 2015	0	MLU Not open in 2015	6	MLU Not open in 2015	0
BHSCT Mater FMU	45/187 (24%)	67/303 (22%)	2	2	15	36	0	0	7	8	0	1

The number of women who transferred from MLU to obstetric unit in 2015 & 2018 are included in the table above. The individual MLU audit did not determine the number of primips (no. of women pregnant for the first time) and multips (no. of women who has given birth more than once) who transferred to the obstetric unit from the MLU for 2015 & 2018 therefore, it is not possible to present the related percentages.

The numbers of women who transferred to other units, including the postnatal ward are not available. Rationale for transfer from MLU are included however, numbers relating to each of the rationale highlighted are not available. This may be because women are transferred from MLU for more than one reason. It is therefore, not possible to present the related percentages.

Q 7. Rationale for Transfer from MLU Cont'd
Table No. 6

Midwife-led Unit name NR = Not Recorded	Sepsis		APH		PPH		Manual removal of placenta (MROP)		Pre-eclampsia /eclampsia		Umbilical cord prolapse	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	N/R	5	N/R	N/R	16	18	14	14	0	0	0	0
Lagan Valley Hospital FMU	1	1	0	3	1	1	3	1	4	0	0	0
Downe FMU	N/R	N/R	N/R	N/R	N/R	N/R	2	1	N/R	N/R	N/R	N/R
Craigavon Area Hospital AMU	2	2	0	2	5	7	20	13	3	0	0	0
Daisy Hill Hospital (DHH) AMU	N/R	0	N/R	1	N/R	0	N/R	2	N/R	2	N/R	0
South West Acute Hospital (SWAH) AMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Altnagelvin Hospital AMU	N/R	4	N/R	2	7	15	5	10	N/R	2	N/R	0
Active Birth Centre RJMS AMU (opened from Oct-Dec 2018)	MLU Not open in 2015	1	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0
BHSCT Mater FMU	2	5	1	0	7	8	3	1	2	1	0	0

Q 7. Rationale for Transfers from MLU

Table No. 7

Midwife-led Unit name NR = Not Recorded	Shoulder dystocia		Abnormal fetal heart rate		Maternal choice		Perineal repair		Other	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	10	14	9	19	N/R	N/R	14	13	33 Delay in 1st or 2nd stage of labour	22 Delay in 1st or 2nd stage of labour
Lagan Valley Hospital FMU	0	0	2	1	0	0	1	1	3 Maternal tachycardia, urinary retention, PROM	2 Not booked, blood stained liquor
Downe FMU	N/R	1	1	2	N/R	N/R	N/R	N/R	N/R	N/R
Craigavon Area Hospital AMU	0	0	20	16	0	0	16	8	22	6
Daisy Hill Hospital (DHH) AMU	N/R	0	N/R	15	N/R	0	0	0	0	2 Maternal drug reaction, PROM & EFM re hospital policy.
South West Acute Hospital (SWAH) AMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Altnagelvin Hospital AMU	4	8	N/R	48	N/R	0	N/R	N/R	N/R	4 women Inappropriate transfer to MLU, 9 women the rationale re transfer N/R.
Active Birth Centre RJMS AMU (opened from Oct-Dec 2018)	MLU Not open in 2015	0	MLU Not open in 2015	3	MLU Not open in 2015	0	MLU Not open in 2015	4	MLU Not open in 2015	1 epileptic & 1 brow presentation
BHSCT Mater FMU	0	0	2	2	2	0	2	3	N/R	N/R

Q 8. Maternal Outcomes following transfer from MLU

Table No. 8

Midwife-led Unit name N/R = Not Recorded	Normal Vaginal Delivery following transfer to obstetric unit		Acceleration of labour with IV syntocinon		Epidural		Urinary catherisation		Vacuum extraction		Forceps birth	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	34	23	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	61	23
Lagan Valley Hospital FMU	6	8	12	7	5	6	11	6	N/R	1	6	4
Downe FMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Craigavon Area Hospital AMU	71	52	85	63	39	23	N/R	N/R	39	21	55	46
Daisy Hill Hospital (DHH) AMU	N/R	54	N/R	19	N/R	14	N/R	28	N/R	14	N/R	14
South West Acute Hospital (SWAH) AMU	N/R	12	N/R	N/R	N/R	N/R	N/R	N/R	N/R	11	N/R	10
Altnagelvin Hospital AMU	N/R	6	N/R	48	N/R	18	N/R	18	N/R	23	N/R	4
Active Birth Centre RJMS AMU (opened from Oct-Dec 2018)	MLU Not open in 2015	11	MLU Not open in 2015	11	MLU Not open in 2015	3	MLU Not open in 2015	N/R	MLU Not open in 2015	10	MLU Not open in 2015	5
BHSCT Mater FMU	N/R	45	N/R	N/R	N/R	3	N/R	N/R	N/R	6	N/R	3

Q 8. Maternal Outcomes following transfer from MLU Cont'd

Table No. 9

Midwife-led Unit name N/R = Not Recorded	Episiotomy		Perineal trauma 1st/2nd degree		Perineal trauma 3rd / 4th degree		Caesarean Section		Admission to ICU		Maternal death	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	N/R	N/R	N/R	N/R	N/R	N/R	26	8	N/R	N/R	0	0
Lagan Valley Hospital FMU	6	6	6	5	1	2	6	3	0	0	0	0
Downe FMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	0	0	0	0
Craigavon Area Hospital AMU	88	70	36	30	13	2	42	34	0	1	0	0
Daisy Hill Hospital (DHH) AMU	N/R	32	N/R	31	N/R	1	N/R	13	N/R	0	N/R	0
South West Acute Hospital (SWAH) AMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	3	N/R	0	0	0
Altnagelvin Hospital AMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	7	N/R	N/R	0	0
Active Birth Centre RJMS AMU (opened from Oct-Dec 2018)	MLU Not open in 2015	16	MLU Not open in 2015	4	MLU Not open in 2015	1	MLU Not open in 2015	5	MLU Not open in 2015	0	MLU Not open in 2015	0
BHSCT Mater FMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	7	0	0	0	0

Q 9. Neonatal Outcomes - Number of babies admitted to NICU or SCBU

Table No. 10

Midwife-led Unit name N/R = Not Recorded	Number of babies admitted to NICU or SCBU	
Year	**2015**	**2018**
Home from Home	18/981 (2%)	10/920 (1%)
Lagan Valley Hospital MLU	4/198 (2%)	4/86 (5%)
Downe	N/R	N/R
Craigavon Area Hospital MLU	10/724 (1%)	11/665 (2%)
Daisy Hill Hospital (DHH MLU)	0/77 (0%)	0/223 (0%)
South West Acute Hospital (SWAH MLU)	2/217 (0.9%)	1/183 (0.5%)
Altnagelvin Hospital MLU	N/R	2/410 (0.4%)
Active Birth Centre RJMS	MLU Not opened	0/131 (0%)
BHSCT Mater MLU	0/187 (0%)	0/303 (0%)
Total Average % rate		1%

On occasions women and their babies were transferred from MLUs to the postnatal ward for further baby observations and care

Q 10. Neonatal Outcomes – Rationale for babies being admitted to NICU or SCBU Table No. 11

The rationale for transfer of a baby from MLU to NICU or SCBU are included in the tables below. However, the exact numbers relating to each of these rationale are not available. This may be because the baby is transferred from MLU to NICU or SCBU for more than one of these reasons. Therefore it is not possible to present the related percentages

Midwife-led Unit name N/R = Not Recorded	**Hypothermia**		**Transient Tachypnoea of the newborn**		**Feeding difficulties/ hypoglycaemia**		**Sepsis**		**IV Antibiotics**		**Congenital abnormality**	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	N/R	N/R	N/R	N/R	8	14	N/R	N/R	13	14	3	1
Lagan Valley Hospital FMU	0	0	2	0	0	0	1	1	0	0	0	0
Downe FMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Craigavon Area Hospital AMU	0	0	3	5	0	1	3	0	0	0	2	0
Daisy Hill Hospital (DHH) AMU	0	0	0	0	0	0	0	0	0	0	0	0
South West Acute Hospital AMU (SWAH)	0	0	0	0	1	1	0	0	0	0	0	0
Altnagelvin Hospital AMU	N/R	0	N/R	2	N/R	0	N/R	1	N/R	1	N/R	0
Active Birth Centre RJMS AMU (opened from Oct-Dec 18)	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0
BHSCT Mater FMU	0	0	0	0	0	0	0	0	0	0	0	0

Q 10. Neonatal Outcomes – Rationale for babies being admitted to NICU or SCBU Cont'd Table No. 12

Midwife-led Unit name N/R = Not Recorded	Low birthweight <10th Centile		Phototherapy		Low APGAR (<7 at minutes)		Neonatal death		Other	
Year	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**	**2015**	**2018**
Home from Home AMU	11	9	9	6	6	4	0	0	14 Resp difficulties	17
Lagan Valley Hospital FMU	0	0	0	0	0	0	0	0	0	0
Downe FMU	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Craigavon Area Hospital AMU	0	0	0	0	0	0	0	0	2 babies One Hypoxic One Ischemic endocephalopathy	5 babies 1) Mec at birth 1) Dusky episodes 1) Surgical gastro 1) Bilious vomiting 1Shoulder dystocia
Daisy Hill Hospital (DHH) AMU	0	0	0	0	0	0	0	0	0	0
South West Acute Hospital (SWAH) AMU	0	0	0	0	1	0	0	0	0	0
Altnagelvin Hospital AMU	N/R	0	N/R	0	N/R	0	0	0	N/R	0
Active Birth Centre RJMS AMU (opened from Oct-Dec 2018)	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0	MLU Not open in 2015	0
BHSCT Mater FMU	0	0	0	0	0	0	0	0	N/R	N/R

Findings: Regional Case Audit of the RQIA Admission to Midwife-Led Units & Normal Labour & Birth Care Pathway

There were 352 cases identified for inclusion in the regional RQIA audit of the maternal and neonatal clinical outcomes relating to the implementation of the Guideline and Pathway. A random sample of women who gave birth in all Midwife-Led Units (MLUs) in NI in 2018 was selected according to the process outlined on

Q1. Number of MLU Case Notes Audited

Cases notes from all of the nine MLUs in Northern Ireland were audited; three FMUs (Freestanding Midwifery Units) and six AMUs (Alongside Midwifery Units). The total number of case notes audited was N=352.

Table No. 13: Number of MLU Case Notes Audited

MLU Name	Number of cases (N=352)
Craigavon AMU (ST)	81
Daisy Hill AMU (ST)	26
Home from Home AMU (SET)	109
Lagan Valley FMU (SET)	11
Downe FMU (SET)	3
SWAH AMU (WT)	22
Altnagelvin AMU (WT)	49
Belfast RJMS ABC AMU (BT)	16
Mater FMU (BT)	35

Q2. Gestation at Birth

The majority of case notes audited were of women who gave birth at term; only one woman was less than 37 weeks gestation when she gave birth and two women gave birth at more 42 weeks gestation.

Table No. 14: Gestation at which women gave birth

Gestation weeks	Number of cases (Total-n=352)	%
<37	1/352	0.3%
37-42	349/352	99%
>42	2/352	0.6%

Q3. Parity of Cases

Most women whose case notes were audited were Primpara 30% (105/352), Para 1, 40% (140/352) or Para 2, 22%, (78/352) (See table 3 below). Only four women had more than four previous births. There were three women who were para 5, and one woman who was para 7, all of whom delivered in AMUs. The results reported here reflect the rate of primpara and para women who birth locally in an MLU.

Table No. 15: Parity of women whose case notes were audited

Parity	Number of cases (Total -n=352)	%
0	105	30%
1	140	40%
2	78	22%
3	19	5%
4	6	2%
5	3	0.8%
6	0	0%
7	1	0.3%

Q4. Ethnic origin

Most women were White 98% (346/352) with a small number of women from Black 0.3%, (1/352) mixed 0.6% (2/352) or other ethnic origin 0.9% (3/352) (See Figure 1).

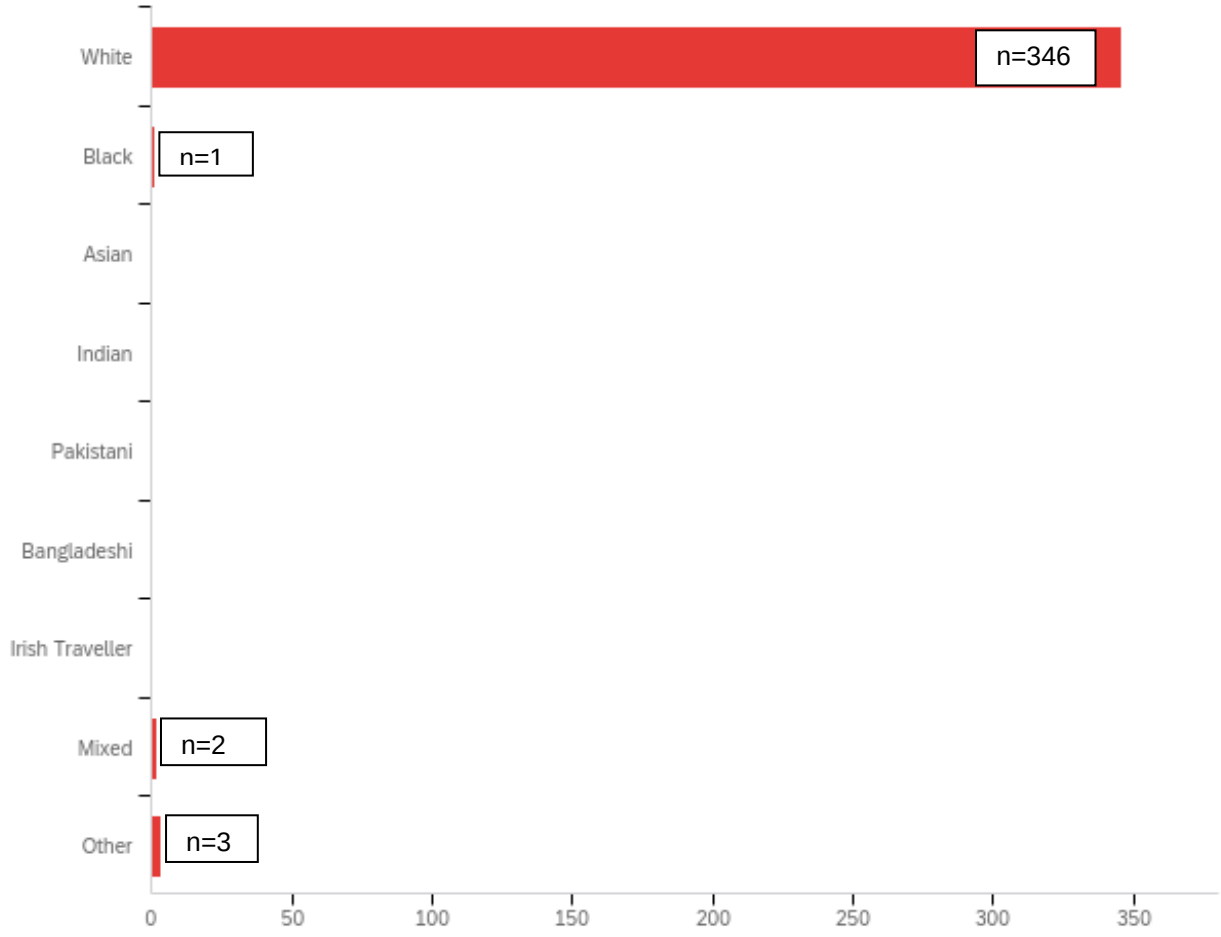


Figure No. 2: Ethnic origin of women whose case notes were audited

Audit Criterion 1 The majority of women admitted to a Midwife-Led Unit should meet the RQIA (2016) criteria for admission to an MLU in Northern Ireland OR an individualised care plan should have been developed

Q5. In the Maternity Hand Held Record (MHHR), the woman met the criteria for admission to MLU as per the RQIA guideline.

In the case notes that were audited, 95% (335/352) of women met the criteria for admission to MLU as per the RQIA guideline. Of the remaining 5% (17/352) case notes; either 4% (n=14/352) women did not meet the criteria or it was not recorded 1% (3/352). In relation to these 1% (3/352) cases, an individualised care plan was considered not applicable due to women having a 'fast' labour (n=2) or a woman being fully dilated (n=1) on admission to MLU.

Table No. 16: The woman met the criteria for admission to MLU as per the RQIA guideline

Response	%	N=352
Yes	95%	335
No	4%	14
N/R	1%	3

Q6. If the woman did not meet the criteria, was an individualised care plan developed?

As noted above, the audited case notes indicated 4% (14/352) of women did not meet the criteria for admission to MLU as per the RQIA guideline.

In the audited case notes, 64% (9/14) of the women had an individualised care plan developed and 36% (5/14) did not. The reasons for an individualised care plan included; medical conditions which had resolved; medical conditions having been investigated did not warrant intervention and capacity issues for obstetric labour ward.

Q7. Additional text providing reason for an individualised care plan:

Reasons for development or non-development of an individualised care plan were provided in free text responses and are included in the table no. 18 below.

Table No. 17: Other reasons for an individualised care plan

Reasons for individualised care plans	No of cases		Reasons provided for not having individualised care plan	No of cases		Reason not recorded	No of cases
Complex social needs, personality disorder and substance misuse	1		Fast Labour	2		No care plan recorded	1
Epilepsy on Carbamazepine, seizure free for 6 years	1		Not contracting regularly	1			
Pulmonary Embolism in current pregnancy on therapeutic Clexane/ history of DVT on Clexane	2						
Late Booker	1						
Latent phase of labour	1						
IOL for reduced Fetal Movement	1						
PROM	1						
Elevated blood pressure	1						
36+3 GESTATION	1						
BMI 16, infant 95th centile	1						

Q8 - Please provide further details on Audit Criterion, 1 if appropriate

Additional information from the case notes provided a range of information that informed the decision about admission to MLU and/or individualised care planning. These have been categorised as follows:

Table No. 18: Additional information which informed decision re: admission to MLU

Maternal Medical History	Previous Obstetric History	Induction of labour	Current Obstetric History	Maternal Mental Health	Social History	Current Fetal/ Previous neonatal reason	Maternal choice	Precipitate labour	Other
22	3	9	8	6	2	5	3	1	7

Audit Criterion 2
All women's individual birth preferences and care during each stage of the pathway should be documented in their Maternity Hand Held Record (MHHR).

Q9 - The GAIN (RQIA) documentation was inserted into the MHHR, if not printed in the MHHR chart. In 54% (n=191/352) of the case notes audited, the GAIN (RQIA) documentation was either already included or inserted into the MHHR and in 46% (n=161/352) it was not.

hormonal and neurohormonal processes hormonal and neurohormonal processes

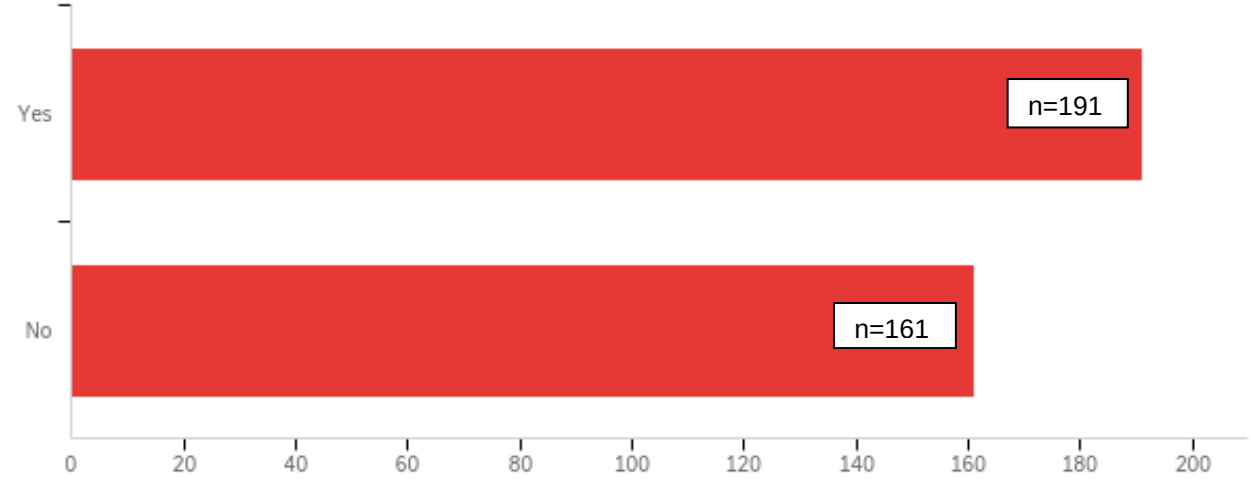


Figure No. 3: The numbers of MHHR in which GAIN (RQIA) documentation was inserted

Q10. Documented that labour/birth preferences recorded in the body of the MHHR or on the guideline documentation

In 69% (244/352) of the case notes audited, the woman's labour and birth preferences were documented. However, in 13% (45/352) of the audited case notes, preferences were not documented or not recorded 18% (n=63/352).

Table No. 19: Documented labour/birth preferences recorded in the body of the MHHR or on the guideline documentation

Response	%	Count N= 352
Yes	69%	244
No	13%	45
N/R	18%	63

Q11. Please provide further details on Audit Criterion 2, if appropriate

As noted above, most often women's preferences in labour were recorded. Where preferences were not recorded, it was not always possible to determine why women's labour/birth preferences were not recorded. However, additional comments provided by data collectors, suggest a number of reasons, such as precipitate labour. In addition, while not all of the labour preferences documents were completed, the data collectors were able to determine that the woman's labour and birth preferences in relation, for example to pain relief and birth position were recorded in the case notes.

Table No. 20: Further information provided about recording of women's labour/birth preferences (themed)

Preferences discussed & Documented on guideline documentation	Birth Plan	Some Preferences documented	Analgesia preferences	Precipitate labour/ admitted in advanced labour	None	Other
9	9	15	5	20	1	3

Audit Criterion 3
The majority of women are assessed to be in active labour on admission to the MLU, commenced on and follow the Normal Labour and Birth Care Pathway.

Q12. Initial labour assessment documentation: antenatal section checked if documentation not inserted in Maternal Hand Held Record (MHHR)

The labour assessment documentation was fully completed in 63% (220/352) of the audited case notes and partially completed in 37% (132/352) of the case notes.

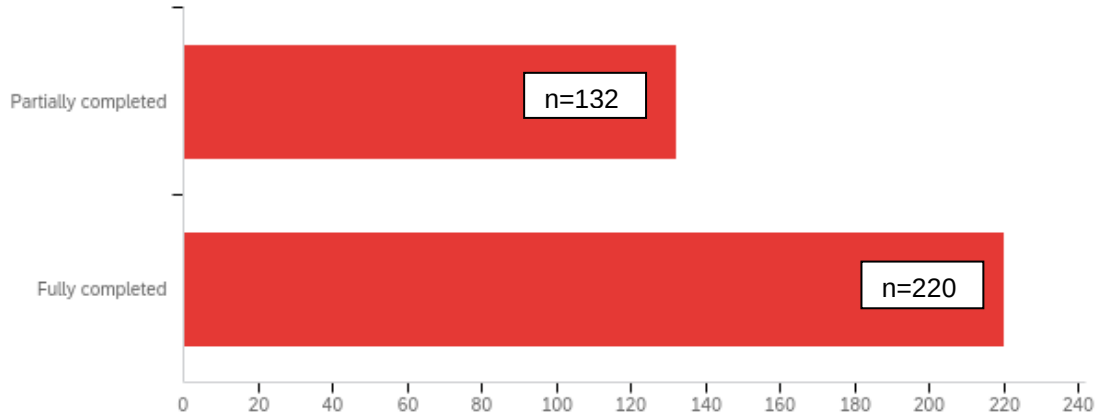


Figure No. 4: Completion of labour assessment documentation in case notes

Q13 - Evidenced that pathway was commenced

In 62% (219/352) of the audited case notes, it was evidenced that the Normal Labour and Birth Care Pathway was commenced and in 38% (133/352), it was not.

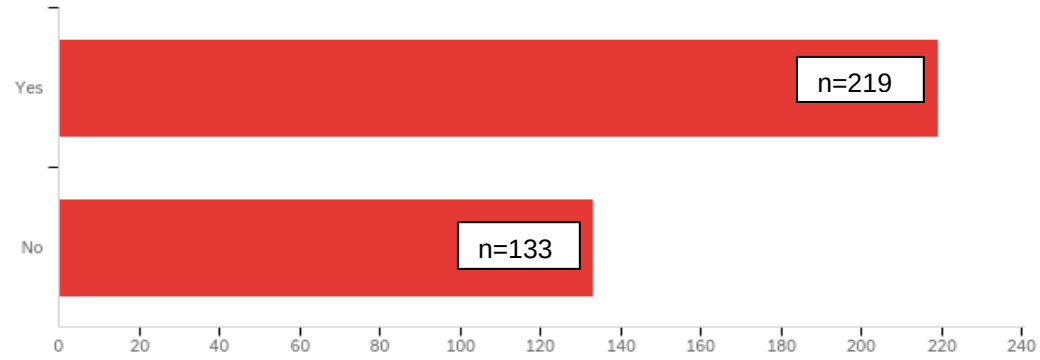


Figure No. 5: Evidence in case notes that the Normal Labour and Birth Care Pathway was commenced

Q14. Did the same midwifery team care for the woman throughout pregnancy, childbirth and post birth?

Each MLU has its own model of care, which includes provision of continuity of care/carer and the availability of a midwifery team to care for women from pregnancy through to the postnatal period. Therefore, five possible responses were provided. In 44% (217/499) of the audited case notes, women were cared for in labour and postnatally until discharged home by the same midwifery team. Just over a fifth 24% (122/499) of the case notes audited, indicated that women were cared for antenatally and postnatally (community) or intrapartum only 21%, (105/499).

Table No. 21: Pattern of midwifery team care for the woman throughout pregnancy, labour and birth

Response	%	N=499*
Antenatally & intrapartum	11%	54
Intrapartum only	21%	105
Antenatally & postnatally (community)	22%	112
Antenatally, intrapartum & postnatally (community)	2%	11
Intrapartum and postnatally until discharge home from hospital	44%	217

*Multiple answers possible

Q15. Mobilisation during labour

In the audited case notes, changing labour positions was the most common type of mobilisation in labour 76% (266/350). The birthing pool was the second most recorded option 44% (154350), followed by squatting 26% (91/350). Multiple mobilisation options were recorded in the audited case notes.

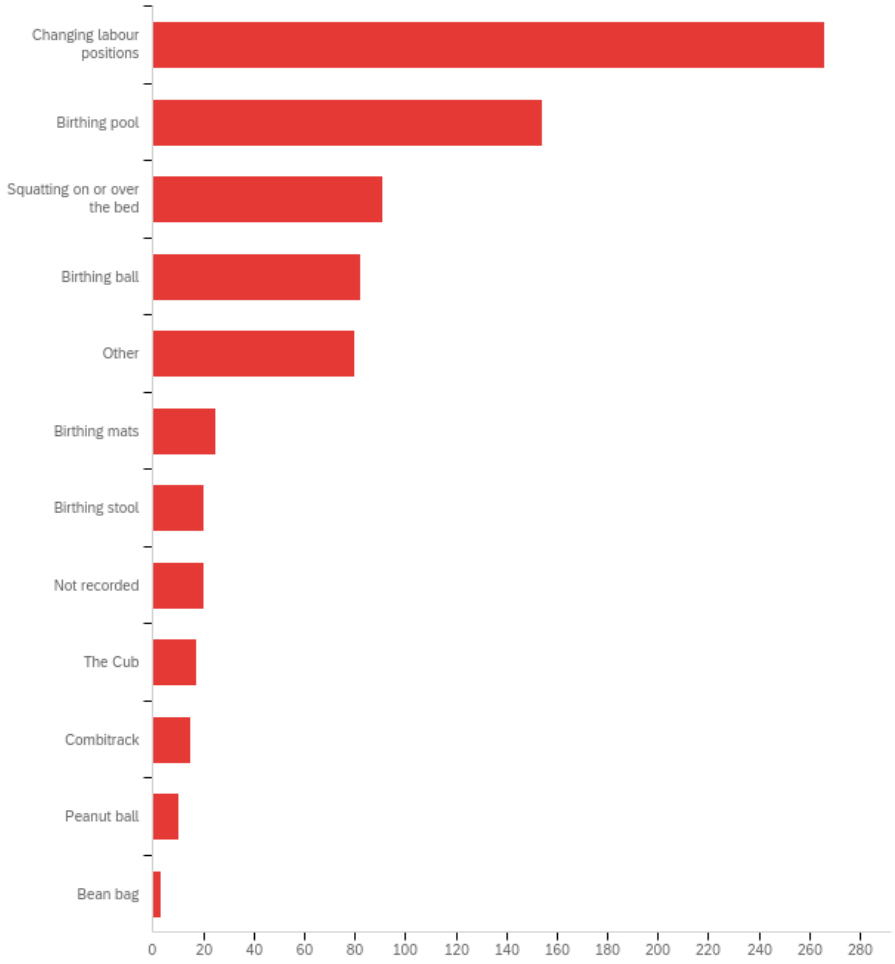


Figure No. 6: Mobilisation during labour (Multiple answers possible)

Q15. Other mobilisation options recorded as being used during labour

There were a number of other mobilisation options recorded in the notes. These including standing at the bedside, sitting upright in bed in a seated position, on all fours, sitting in the bath, walking to the bathroom and sitting on the toilet.

Table No. 22: Other mobilisation options recorded as being used during labour

Standing at bedside/ in bed	Sitting upright with bed in chair position/birthing chair/ rocking chair	On all fours/ kneeling	Sitting in Bath	Walked to bathroom/ sitting on toilet	Walking around	Lateral positions	Heat Pack	Hip rotations	Stretches/ hula hoop movements
10	2	22	12	11	3	7	1	1	2

Q16. Coping mechanisms for uterine activity

A wide range of coping mechanisms for uterine activity were recorded in the case notes. Entonox was the primary coping mechanism in 88% (309/352) of the audited case notes followed by controlled breathing 48% (169/352), immersion in water 46% (161/352), environmental factors 40% (141/352) and Diamorphine 29% (103/352). Complementary therapies including aromatherapy, hypnobirthing, reflexology, acupressure, acupuncture and massage were used by 22% (78/352) of the women.

Table No. 23: Coping mechanisms for uterine activity (multiple options)

Response	N=1050
Controlled breathing	169
TENS	17
Entonox	309
Diamorphine	103
Immersion in water during labour	161
Subcutaneous water for injection	0
Aromatherapy	23
Environmental lights dimmed, music	141
Hypnobirthing	32
Other	12
Not recorded	4
Reflexology	16
Acupressure	4
Moxibustion	0
Visualisation	12
Herbal remedies (including Rescue Remedy)	0
Vocalisation	47

Q16. Other coping mechanisms for uterine activity

Some women used other coping mechanisms for uterine activity. These included acupuncture, cool cloth on head, counter pressure on lower back, massage and heat packs.

Q17. Doula present

None of the case notes audited had a record of a doula being present with a woman during labour and birth.

Q18. How progress was determined, in second stage of labour

Progress in second stage of labour was determined most often by the woman indicating an urge to push 83% (292/350*), expulsive contractions 58%, (202/350*), signs of second stage 57% (200/350*) and the woman's behaviour 50% (176/350*).

(*n=350 as two of the case notes audited were inadvertently included, they had been transferred to the obstetric unit in the first stage of labour, therefore before second stage).

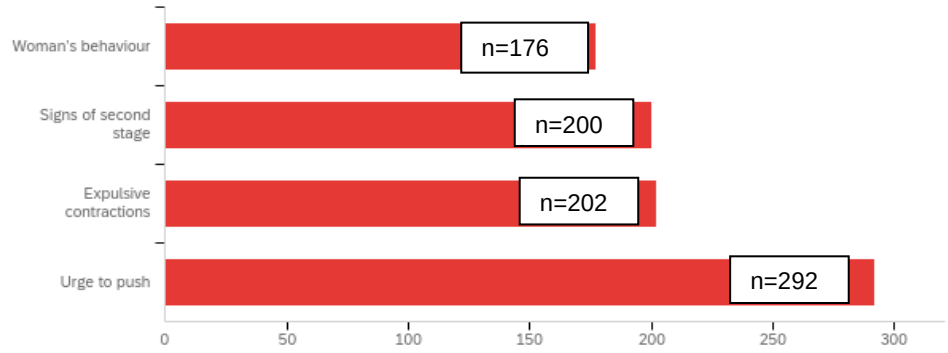


Figure No. 7: How progress was determined in second stage of labour

Q19. Full dilatation of cervix confirmed by vaginal examination

Of the 350* case notes audited, 83% (289/350*) of the women did not have full dilatation of their cervix confirmed by vaginal examination (VE). This is clearly linked with the responses to the previous question where the women's behaviour and external signs of 2nd stage were used to determine progress in the second stage of labour.

Table No. 24: Full dilatation of cervix confirmed by vaginal examination

Response	%	N=350
Yes	17 %	61
No	83%	289

*n=350 as two of the case notes audited transferred to the OU in the first stage of labour

Q20. Total number of vaginal examination(s) prior to admission to MLU (including latent phase and membrane sweeps)

Of the case notes audited, 13% (44/352) did not have a vaginal examination prior to admission to MLU and 41% (n=144/352) had one vaginal examination. Five of the free text responses indicated that a membrane sweep was carried out on at least one occasion prior to admission to the MLU. It was also recorded in five of the audited case notes that six vaginal examinations were carried out prior to admission to a MLU. The timing of the maternal request for vaginal examination was unknown and there was one record of a woman requesting multiple vaginal examinations in the induction ward.

Table No. 25: Total number of vaginal examination(s) prior to admission to MLU

No of VE's	%	N=352**
0	13 %	44
1	41%	144
2	29%	102
3	9%	32
4	4%	14
Other	4%	16

(**3 woman transferred during labour included here, as prior to admission to MLU)

Q21. Total number of vaginal examinations (VE) during active labour (first and second stage)

In the audited case notes, 40% (139/349*) of women did not have any vaginal examinations during active labour (first and second stage) and 41% (142/349) had only one VE in labour with 13% (46/349) having two VEs; see table no. 27.

(*n=349 as three case notes were inadvertently audited, they had been transferred to OU during labour, data relating to these case notes excluded here)

Table No. 26: Total number of vaginal examinations (VE) during active labour (first and second stage)

No of VE	%	N=349*
0	40%	139
1	41 %	142
2	13 %	46
3	5%	17
4	1%	3
5	0.3%	1
Other	0.3%	1

Table No. 27: Case notes where 5 or more Vaginal Examinations were recorded.

Gestation	Parity	Number of VE's prior to admission	Number of VE's during active labour	Labour duration	Frequency of VE per pathway?	Comments
40+1	1	6	4	12 hrs 21 mins	No	Maternal request in latent phase of labour for VE'S
39+4	0	2	4	12 hrs 10 mins	Yes	Sister asked to attend for delivery as delay in second stage
40+2	1	2	4	12 hrs 1 min	Yes	
39+2	1	1	5	9 hrs 30 mins	Yes	
40+2	1	3	6	12 hrs 59 mins	No	Transfer out of MLU at 7cm-slow progress 4 V.E's preformed in MLU and 2 in UHM in established labour
40+3	2	3	Other: Fully dilated for	5 hrs 30 mins	No	

			3 hours			

Q22 - Frequency of vaginal examination as per pathway

In the case notes audited, the Normal Labour and Birth care Pathway was followed in 86% (299/349). In relation to the frequency of vaginal examination, this is accounted for by the case notes where it was indicated that a VE was not required or was performed as per the care pathway. In addition, further comments by data collectors indicated that there were three maternal requests for VEs while in labour.

Table No. 28: Frequency of Vaginal Examination as per pathway

Vaginal Examination	%	N=349*
Yes	58%	203
No	14%	50
VE not required	28%	96

(*n=349 as three case notes were inadvertently audited, they had been transferred to OU during labour, data relating to these case notes excluded here)

Q23. Was an Artificial Rupture of Membranes (ARM) undertaken in line with the pathway?

Of cases notes audited 84% (294/349) indicated that an Artificial Rupture of Membranes (ARM) was not required. Ten percent (35/349) had recorded ARM's were carried out according to the Normal Labour and Birth Care Pathway, with 6% (20/349) having an ARM which did not follow the pathway. There were two maternal requests for ARM.

Table No. 29: Artificial Rupture of Membranes (ARM) undertaken in line with the pathway

ARM performed	%	N=349
Yes	10%	35
No	6%	20
ARM not required	84%	294

Q24. Plan of intrapartum care discussed with appropriate colleague

In 75% (263/3490) of the case notes audited a discussion with a colleague about the intrapartum plan of care was not required.

Table No. 30: Plan of intrapartum care discussed with colleague

Response	%	N=349
Yes	23 %	81
No	1%	5
Not required	75%	263

Q25. & Q26. Total duration of established labour and birth in hours & minutes (noted on Northern Ireland Maternity System (NIMATS)).

Thirty six percent (124/349) of the women's case notes recorded the duration of their labour as less than three hours, with 61% (213/349) lasting less than five hours. These results could indicate that the majority of women were in established labour on admission to MLU. In total, 79%, (276/349) of the women's labours were less than seven hours in duration. This would indicate that the majority of women whose notes were audited were being admitted to MLUs in established labour. Three women had a labour duration greater than 17 hours. The longest labour recorded was 20 hours and 15 minutes (n=1). For these women who may have been in the latent phase of labour facilities are necessary in or near MLUs to prevent the woman being admitted and commenced on the normal labour and birth pathway and then being transferred out to birth in OU.

Table No. 31: Women who experienced labour greater than 17 hours

FMU/AMU	Gestation	Parity	Met criteria for admission to MLU?	Duration	Mode of delivery	Notes
AMU	41+5	0	Yes	20 hours 15 mins	Vaginal cephalic birth	Membranes ruptured total-28 hours 45 minutes
AMU	40+1	0	Yes	18 hours 45 mins	Vaginal cephalic birth	
AMU	41+5	0	Yes	17 hours 9 mins 3 hour 12 minute second stage	Vaginal cephalic birth	BMI 38.8 IOL for post maturity. No external rotation after birth of head shoulders in transverse rotated to AP diameter and shoulders delivered with esae at next contraction Maternal low sodium in labour 123mmol/L PHs 7.27, 7.40 PHs performed as prolonged second stage and maternal hyponatremia Not transferred

Table No. 32: Total duration of established labour and birth in Hours

Duration	No. of cases (N=349)	%
<1	14	4
1<2	53	15
2<3	57	16
3<4	47	13.
4<5	42	12
5<6	34	10
6<7	29	8
7<8	15	4.
8<9	19	5
9<10	11	3
10<11	11	3
11<12	4	1
12<13	6	2
13<14	0	0
14<15	2	1
15<16	2	1
16<17	0	0
17<18	1	0.3
18<19	1	0.3
19<20	0	0
20<21	1	0.3

Audit Criterion 4 What were the maternal outcome indicators related to giving birth in the MLU for the individual woman?

Q27. Mode of birth

All of the women which birthed in a MLU recorded a cephalic vaginal birth (land) 68% (236/349) or a cephalic vaginal water birth 32% (113/349).

Table No. 33: Mode of birth

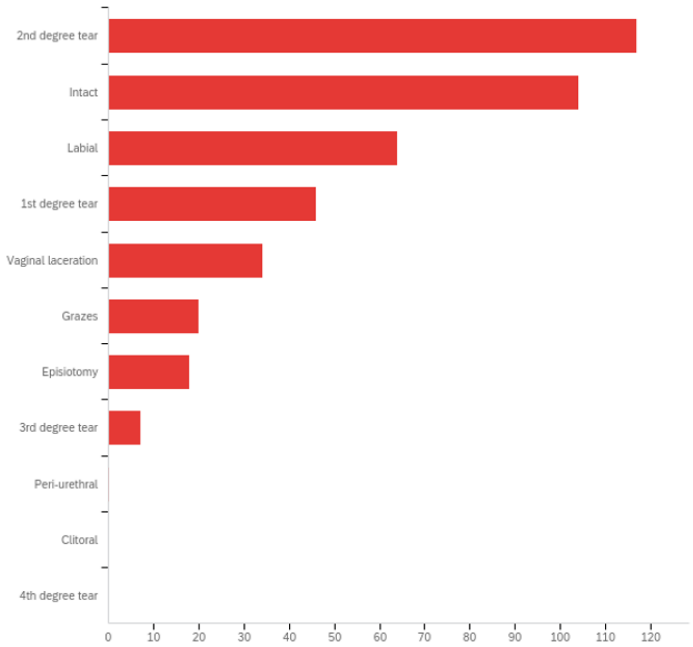
Mode of birth	%	N=349
Cephalic vaginal birth land	68%	236
Cephalic vaginal water birth	32%	113

Q28. Perineal trauma sustained during delivery

In the audited case notes 30% (104/349) of women had an intact perineum, 33% (n=116/349) sustained a 2nd degree tear and 2% (7/349) sustained a 3rd degree tear.

Q29. Perineal Trauma

Figure No. 8: Perineal trauma



Of the case notes audited, 46% (161/349) of the women who sustained grazes,

labial, peri-urethral and 1st degree tears which did not require suturing. See table No.35 - One percent (n=3/349) of the case notes indicated that the woman had declined suturing.

Table No. 34: Figure No. 8: Perineal suturing

Response	%	N=349
Not required	46%	161
Performed	53%	185
Required but not initially identified	0%	0
Woman declined	1%	3

Q30. Skin to skin

Skin to skin contact for the mother and baby of at least one hour was recorded in 36% (125/349) of the case notes audited.

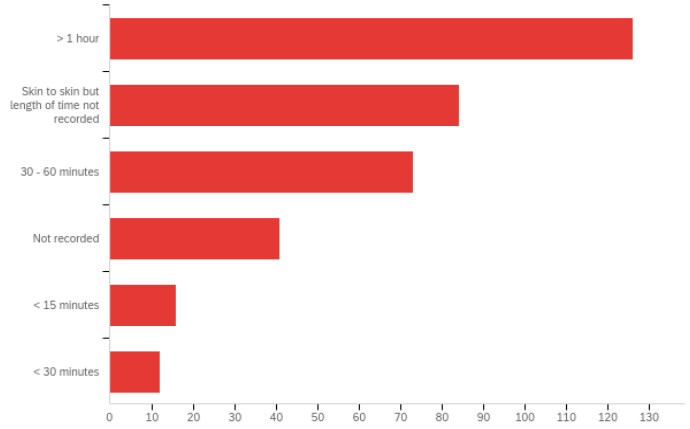


Figure No. 9: Duration of skin to skin contact for the mother and baby

Response	%	N=349
< 15 minutes	4%	16
< 30 minutes	3%	12
30 - 60 minutes	21%	73
> 1 hour	36%	125
Not recorded	11%	39
Skin to skin but length of time not recorded	24%	84

Table No. 35: Duration of skin to skin contact for the mother and baby

Q31. Breastfeeding initiated at birth

Initiation of Breastfeeding at birth was recorded in 67% (235/349) of the audited case notes.

Table No. 36: Breastfeeding initiated at birth

Response	%	N=349
Yes	67%	235
No	32%	112
N/R	1%	2

Q32. Breastfeeding on discharge home

Breastfeeding on discharge home was recorded in 59% (207/349) of the audited case notes.

Table No. 37: Breastfeeding on discharge home

Response	%	N=349
Yes	59%	207
No	37%	129
N/A	4%	13

Q33. Responsive infant feeding by woman (including formula feeding)

Responsive Infant Feeding was recorded in 98% (n=349) of the audited case notes. Data recorded as N/A for two cases.

Table No. 38: Responsive infant feeding by woman (including formula feeding)

Response	%	N=349
Yes	98%	343
No	1%	4
Data recorded as N/A	1%	2

Q34. IV cannulation with no indication

There were two recorded instances of IV cannulation with no indication. One related to a ‘very quick delivery; no pathway in notes’. For the other case, in an AMU, no other details were recorded.

Table No. 39: Numbers of IV cannulation

Response	%	N=349
Yes	1%	2
No	27%	95
N/A	72%	252

Q35. Urinary catheterisation during labour

Urinary catheterisation was recorded as not required in 93% (n=326/349) of the audited case notes.

Table No. 40: Urinary catheterisation during labour

Response	%	N=349
Intermittent	5%	18
Indwelling	1%	5
Not required	93%	326

Q36. Management of 3rd stage of labour

Physiological third stage was recorded in 17% (60/349) of the audited case notes. However, 82% (285/349) of the case notes recorded had active management of the 3rd stage of labour.

Table No. 41: Management of 3rd stage of labour

Response	%	N=349
Physiological	17%	60
Active management	82%	285
Physiological followed by active management	1%	4

Q37. Significant postnatal blood loss

In the case notes audited, 92% (320/349) did not record a significant postnatal blood loss.

Table No. 42: Postnatal blood loss

Response	%	N=349
> 500mls not requiring intervention	5%	17
>500mls requiring midwifery intervention	1%	5
> 500mls requiring medical intervention	2.0%	7
No significant postnatal blood loss	92%	320

Table No. 43: Additional information re Midwifery and medical intervention for blood loss

AMU/FMU	>500mls requiring midwifery intervention	> 500mls requiring medical intervention
AMU	PPH	PPH Postnatal transfer of care due to PPH
	PPH Life threatening Transferred to delivery suite one floor below MLU in the lift. same midwives cared for her that were present at birth	PPH
	PPH Transferred to postnatal ward for blood loss greater than 1200ml BUT States later not transferred	PPH Incomplete membranes Transferred to postnatal ward
	Does not state 12 hrs meconium observations remained in MLU	PPH Transferred to postnatal ward
	Other – no further details reported	PPH life threatening in house transfer from xx to labour ward
FMU		PPH
		Retained Placenta (active bleeding)

Q38 - Obstetric emergency

In the majority of the audited case notes, an obstetric emergency was not recorded (95%, n=331/349). Of the 18 cases where an obstetric emergency was recorded, there were three instances of retained placenta with active bleeding, 2 cases of shoulder dystocia, 1 case where the cord snapped and 1 third degree tear.

There were 10 cases of post-partum haemorrhage (PPH) reported. In 1 of these cases of PPH the woman also had incomplete membranes and in another the woman had difficulty voiding. In 1 case the details of the obstetric emergency were not reported.

Q39. Partner/Significant other stayed with woman postnatally in MLU

In 75% (261/349) of the case notes, the significant other/partner either stayed with the woman for the full duration 31% 107/349) or for the partial duration of the woman's stay 44% (154/350). In the majority of the MLU's, it is policy to offer the significant other the opportunity to stay with the woman in the MLU postnatally.

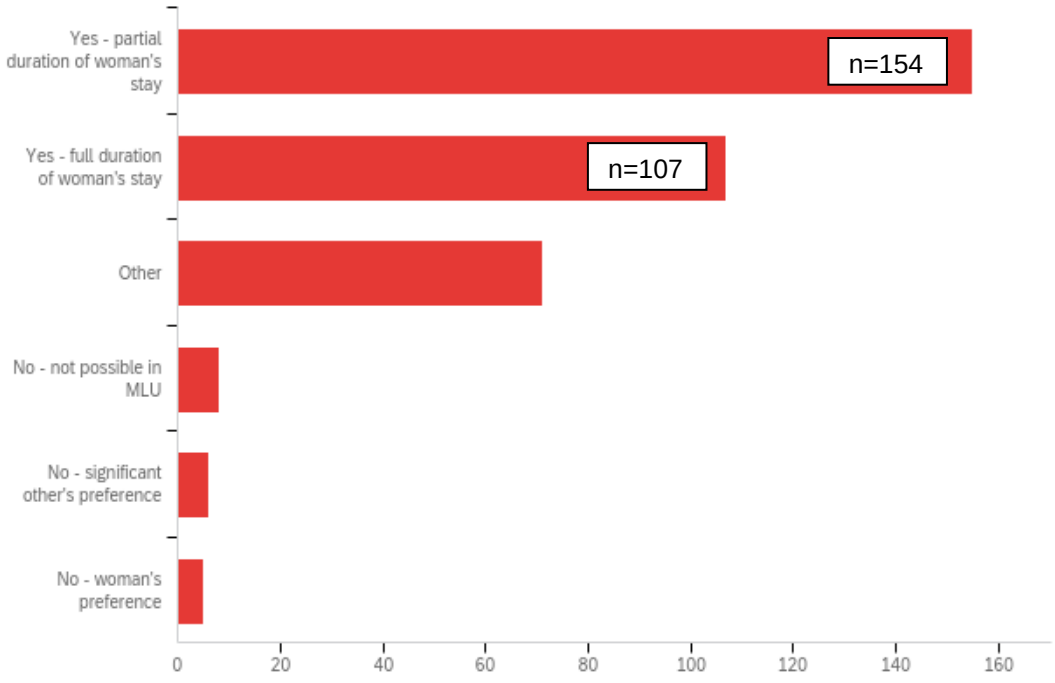


Figure No. 10: Significant other stayed with woman postnatally in MLU

Q39. Additional text responses related to significant other staying with woman postnatally in MLU

Most often, the reason why the significant other did not stay was that the women were transferred to the postnatal ward for a variety of reasons. These included shortage of staff on obstetric unit resulting in closure of MLU and therefore staying on the MLU was not an option. Some women went home after six hours. On two occasions it was recorded that the significant other did not stay, at the woman's request.

Q40. Number of different caregivers during labour and birth (across breaks / shift changes; including medical / midwifery students) based on signature pages on MHHR.

The number of care givers during labour and birth ranged from one to six. However, it is a complex matter to record accurately as additional caregivers may provide care for short time periods, such as during a break or during a professional discussion or may be a student midwife may also be present. As is clear from the table below, most of the audited case notes indicated that most women had one or two caregivers 77% (267/349).

Table No. 44: Number of different caregivers during labour/birth

Number of different caregivers during labour/Birth	%	N=349
1	29%	101
2	48%	166
3	16%	55
4	6%	21
5	1%	4
6	1%	2

Q41. Further details relating to Audit Criterion 4

Additional data was included in the responses above

Audit Criterion 5
What were the neonatal outcome indicators related to being birthed in the MLU for the baby?

Q42. Birth

In all of the case notes audited (n=349) for women who birthed in MLU, the outcome for the neonate was a live birth.

Q43. Birth weight

In the case notes audited, 77% (270/**349) of the babies were 3000-4000g.Two of the babies were less than 2500g in weight.

Table No. 45: Birth Weight

Response	%	N=349
<2,500g	1%	2
2,500 - 2,999g	5%	18
3000 - 3499g	38%	133
3500 - 3999g	40%	138
4000 - 4999g	17%	59
>5000g	0.0%	0

Q44. Birth Centile- expected and actual

For 10 babies their actual birth centile was equal to the expected centile. The table below indicates those babies with actual birth centiles less than 10th and greater than 90th.

Table No. 46: Babies with actual birth centiles less than 10th and greater than 90th

Birth Centiles	<10th centile	>90th Centile
Number of babies	11	30

Q45. Skin to skin with significant other (other than the mother)

Five percent (19/349) of the babies in the audited case notes had a record of skin to skin with significant other.

Table No. 47: Skin to skin with significant other (other than the mother)

Response	%	N=349
Yes	5%	19
No	21%	76
N/R	73%	254

Q46. Additional baby care required

Eighty six percent (299/349) of the babies in the audited case notes did not require additional care. Two babies required admission to SCBU and one baby to NICU. A further six babies needed admitted to the postnatal ward for observations and one baby required phototherapy /IV Antibiotics) (see table 49 below).

Table No. 48: Additional baby care required

Response	%	N=349
None	86%	299
Admission to SCBU	1%	2
Admission to NICU	0.3%	1
Admitted to postnatal ward for further baby care observations	2%	6
Admitted to postnatal ward for further baby care interventions (phototherapy, IV antibiotics)	0.3%	1
Other	12%	40

Information relating to additional neonatal care provided highlighted the most common reason was for observation of the neonate for 12 hours (n=23), adherence to the hypogylcaemia protocol (n=2) and the monitoring of the neonates blood sugar levels (n=3).

Table No. 49: Other reasons for additional neonatal care

Other Reasons for additional neonatal care	Number of cases
NEWTT observations for 12 Hrs	23
Hypoglycaemia protocol	2
Tongue tie snipped on the ward	1
pHs, U&E as mother had low sodium in labour	1
BMs for PROM, BMs as below 10th centile	3
Low temperature, reviewed by paediatrician, cared for in incubator and care resolved	1
Blood group, Hb Coombs SBR at birth	1
Mum and baby admitted to postnatal ward for maternal observation	1
Baby broken arm diagnosed	1
Safeguarding issues so infant and mum interactions closely observed	1
Maternal GBS & phototherapy	1
Suctioning for colour change	1
Transferred to postnatal with mum from MLU due to staff shortages	1
Lower facial palsy	1
Capacity transfer	1

Q47 - Optimal cord clamping ("Wait for White" following physiological 3rd stage of labour)

In the audited case notes, optimal cord clamping was followed in 29% (102/349) of cases.

Table No. 50: Optimal cord clamping undertaken

Response	%	N=349
Yes	29%	102
No	46%	159
N/R	25%	88

Q48. Timing of cord clamping following active management of 3rd stage of labour

The raw data relating to this question was difficult to analyse and therefore the project team were unable to present results for question 48.

Q49. Was neonatal resuscitation required?

Neonatal resuscitation was not required in 89% (309/349) cases. More than one practice was documented i.e. in 12% (41/349) of the cases, just stimulation was required with nine babies requiring inflation breaths, two babies requiring ventilation breaths and two requiring medication.

Q50 - If resuscitation was required, was umbilical cord intact during resuscitation (for example inflation breaths)?

In the audited notes, the umbilical cord was intact during resuscitation on 27% (n=11/41) occasions. For the remainder 30 cases, it is not clear from the data the rationale for cutting the cord during resuscitation.

Q51 - APGAR at 5 minutes

In the audited case notes, 97% (340/349) of the babies had an Apgar score of 9-10 at 5 minutes.

Table No. 51: Apgar scores at 5 minutes

APGAR Score @5 minutes	N=349	%
9-10	340	97%
<9	9	3%

Table No. 52: Detail for n=9 babies who had Apgar less than 9.

APGAR Score	Gest	Parity	Met RQIA guidelines for admission to and MLU	Individualised care plan	Mode of Delivery	Labour duration	Expected centile	Actual centile	Resus.	Cord intact	pH required	pH performed	Additional info.
8	40+7	0	Yes	NA	vaginal birth	14 hours 20 minutes	85	79.8	No	NA	No	NA	No additional baby care, not transferred
8	40+7	2	Yes	NA	vaginal birth	6 hours 37 minutes	50	95	stimulation, inflation breaths	No	Yes	No	No additional baby care, not transferred
8	41+2	1	Yes	NA	vaginal birth	3 hours 40 minutes	50	NR	No	NA	No	NA	No additional baby care, transferred as MLU shut due to staff shortages
8	41+4	1	Yes	NA	vaginal birth	5 hours 30 minutes	50	68.5	stimulation, inflation breaths	No	No	NA	No additional baby care, not transferred
8	40+2	2	Yes	NA	waterbirth	6 hours 42 minutes	80	77.1	No	NA	No	No	Transferred for post-natal ward due to PPH
6	40+4	3	no	Yes	vaginal birth	4 hours 23 minutes	50	52	stimulation, inflation breaths and medication	No	Yes	No	Women and baby were 'transferred to postnatal ward for ongoing postnatal care' and NAS observations. Further details on criterion 5 included 'Baby cried at birth and Apgar score at 1 minute = 8, however poor respiratory effort noted at 3 minutes old and resuscitation implemented. Diamorphine administered to mother 52 minutes

													prior to birth, therefore Naloxone administered to baby during resuscitation'
6	39+5	1	Yes	NA	vaginal birth	7 hours 30 minute	50	68	stimulation, inflation breaths	No	No	NA	No additional baby care, not transferred
5	38+5	1	Yes	NA	waterbirth	1 hour 34 minutes	45	9.6	No	N0	NA	NA	transferred from induction bay - IOL for srom; 24 hours 2 speculum examinations to confirm/deny SROM, VE then not required remained in MLU for pre-feed BMs and NEWTTS
5	40+3	0	Yes	NA	vaginal birth	10 hours 53 minute	50	19.9	stimulation, inflation breaths, ventilation breaths and medication	No	Yes	No	Smoker VE and ARM undertaken prior to second dose of diamorphine baby initially responded well to stimulation but became limp at 5 mins No additional baby care, not transferred

Q52. Umbilical Cord pHs Performed

In the case notes audited, 97% (340/349) of the babies did not require a cord pH. However, there were four babies (1% 4/349) who required a cord pH that were not done. The reasons for this were not stated.

Table No. 53: Umbilical Cord pHs performed

Response	%	N=349
Not required?	97%	340
Required, but not performed?	1%	4
Performed, but not required	1%	2
Impossible to perform (e.g. blood gas analyser unavailable)?	0%	0
Performed	1%	3

Q53. Significant infant birth trauma noted (written in notes or marked on Body Map).

Significant birth trauma was noted in 3% (9/349) of the case notes. The type of birth trauma was indicated in other text for eight of the babies but no detail provided for one case.

Table No. 54: Significant infant birth trauma noted

Response	%	N=349
Yes	3%	9
No	97%	340

Q53. Significant infant birth trauma noted (written in notes or marked on Body Map).

The significant birth trauma noted included cephalhaematoma (n=2), baby diagnosed with a fractured arm on day three and a birth mark.

Q54. Undiagnosed fetal abnormality - If yes, please give details

In the 349 case notes audited, only two babies had an undiagnosed abnormality at birth. One was recorded as congenital hypoplasia of the depressor anguli oris muscle and the other was not recorded.

Q55. Further details on Audit Criterion 5, as appropriate

Free text responses informed responses to questions under criterion 5.

Audit Criterion 6 All women who require transfer to another MLU or Obstetric Unit are transferred and rationale provided.

Q56. Was the woman transferred to another MLU or obstetric unit?

There were 17% (59/352) women who required transfer
(3 women transferred during labour included here).

Table No. 55: Transfers to MLU or obstetric unit

Response	%	N=352
Yes	17%	59
No	83%	293

Of the 59 women who required transfer, 39% (23/59) were primiparous - resulting in an overall rate of 21% transfer rate for primiparous women.

Of those transferred 61% (36/59) were parous women - resulting in an overall transfer rate for 15% for parous women (see below).

Table No. 56: Transfer rate by parity

Parity	%	N=352
Primiparous	23/105 =**21%**	23
Parous	36/247=**15%**	36

Q57. Rationale for transfer documented

Rationale for transfer was documented on the SBAR or HART Tool in 14% (8/59) of the case notes. However, in 37% (22/59) of the cases notes, the rationale for transfer was not documented. In 49% (29/59) of the cases the transfer was discussed on the telephone or another form of verbal handover.

Table No. 57: Rationale for transfer documented

Response	%	N=59
Regional In Utero Transfer Pro forma	0%	0
HART tool	2%	1
SBAR	12%	7
Not documented	37%	22
Other	49%	29

Q58. Stage in which women were transferred from MLU

In the audited cases notes, of the 59 women who were transferred from the MLU to the Obstetric Unit, as mentioned above, three case notes related to women who had been transferred to OU during labour and were inadvertently audited. Outcomes relating to these three women include: one woman was transferred in the latent phase of labour and proceeded to have emergency caesarean section, one woman transferred in the 1st stage of labour for a delay in labour progress and had a cephalic vaginal birth in the obstetric unit. One woman transferred in the second stage of labour for delay in labour progress and had a kiwi vacuum birth in the obstetric unit.

Six women 10% (6/59) were transferred in the third stage of labour and fifty women 85% (50/59) postnatally.

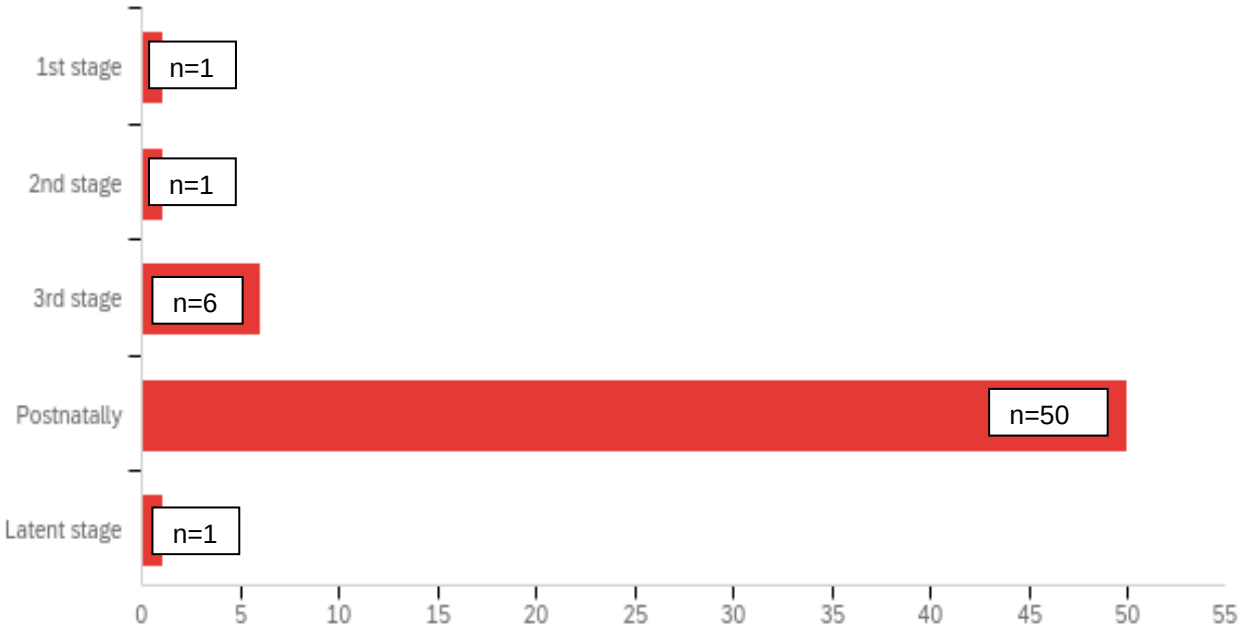


Figure No. 11: Stage in which women were transferred from MLU

Q59. Rationale for transfer of woman

On occasions more than one reason was given for transfer, ten women were transferred to the obstetric unit due to staffing issues in the MLU. Nine women due to PPH, five for repair of perineal tear in theatre and four women for Manual Removal of Placenta: see table below

Table No. 58: Rationale for Transfer of woman

Response	%	N=71 *
Not in labour	0%	0
Analgesia	1%	1
Delay in labour progress (1st stage)	1%	1
Delay in labour progress (2nd stage)	1%	1
Significant Meconium	0%	0
Undiagnosed breech	0%	0
PROM	0%	0
Sepsis	0%	0
PPH	13%	9
Maternal collapse	0%	0
Manual removal of placenta (MROP)	6%	4
Pre-eclampsia / eclampsia	0%	0
Cord prolapse	0%	0
Shoulder dystocia	0%	0
Abnormal fetal heart rate	0%	0
Maternal choice	0%	0
Perineal repair in theatre	7%	5
Staffing in MLU	14%	10
Capacity in MLU	3%	2
Continued observation of baby	7%	5
Suspected neonatal abnormality	0%	0
Other maternal or neonatal reasons for transfer, give details below	47%	33
APH	0%	0

*On occasions more than one reason was given for transfer

Q59 -Other maternal or neonatal reasons for transfer, give details below

In the additional comments provided, maternal and neonatal reasons for transfer from the MLU to Obstetric unit, included (n=16) noting that staffing issues in OU were a common theme. Lack of capacity to give birth in MLU was recorded on two occasions, as women who had already given birth still occupied the rooms.

Q60 - Transfer urgency

Sixty four percent (38/59) of the transfers were recorded in the audited case notes as non-life threatening and 7% (4/59) were deemed life threatening. The transfer urgency of the additional 29% (17/59) were not recorded on the audit, these women had transferred from an Alongside MLU to Obstetric Unit.

In relation to the four women who were transferred for life threatening reasons:

- One woman in an AMU had a PPH with blood loss >500mls requiring midwifery intervention and was 'transferred to obstetric unit. The same midwives cared for her that were present at birth'. Transfer rationale was not completed.

- One woman who gave birth in an AMU had a PPH greater than 500mls, which required medical intervention. It was recorded as an 'in house transfer'. Transfer rationale was reported as 'verbal handover'.

- One woman who gave birth in an FMU has a PPH of greater than 500mls which required medical intervention. She was transferred to an obstetric unit within the same Trust. The duration of transfer (documented using SBAR) was 35 minutes and 10 minutes upon arrival at obstetric unit to handover of care.

- One woman in an FMU had a retained placenta accompanied by a PPH of greater than 500mls which required medical intervention. The duration of transfer (documented using SBAR) was 34 minutes and eight minutes upon arrival at obstetric unit to handover of care. A manual removal of placenta in theatre was required with a total EBL of 850mls.

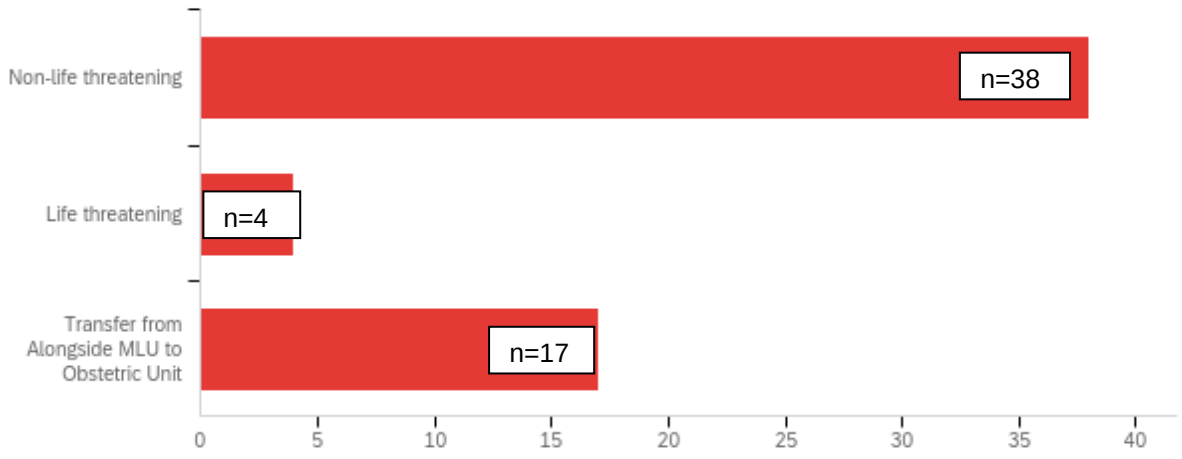


Figure No. 12: Transfer urgency from MLU to an Obstetric

Q61 & 62. Transfer duration time in Hours and Minutes (from ambulance called to arrival at Obstetric Unit)

A total of 59/352 women were transferred: (3/59) during first or second stage of labour, (6/59) in the third stage or postnatally (50/59). Seven of these women required ambulance transfer to an obstetric unit. The average ambulance transfer duration time (from ambulance called to arrival at Obstetric Unit) for these women was 88 minutes (ranging from 25 mins - 230 mins).

Findings: Audit of Normal Labour and Birth Care Pathway within Obstetric Units

Table No. 59: Birth rates in Audited Obstetric Units

Obstetric unit name	2018	2019
Antrim Area Hospital obstetric unit	2863	2906
Causeway hospital obstetric unit	898	903

Q1 Numbers of case notes of women who had a straightforward pregnancy and gave birth in 2018 by Obstetric Unit - Causeway or Antrim

Table No. 60: Obstetric units

Obstetric unit name	Number of case notes (N=62)	%
Antrim Area Hospital obstetric unit	45	73%
Causeway hospital obstetric unit	17	27%

Q2 - Gestation at Birth of Cases

The majority of case notes audited were of women who gave birth at term; only two women were < 37 weeks gestation when they gave birth.

Table No. 61: Gestation at which women gave birth

Gestation weeks	Number of cases (Total-n=62)	%
37-42	60	97%
< 37 weeks	2	3%

Q3 – Parity of women in case notes audited

Of case notes audited 45% (28/62) were of women who were Para 0 and 37% (23/62) Para 1.

Table No. 62: Parity of women in case notes audited

Parity	Cases (n/N)	%
0	28	45%
1	23	37%
2	8	13%
3	3	5%

Q4 - Ethnic origin of women

In all of the 62 audited case notes, the women who gave birth were of white ethnic origin.

Audit Criterion 1
Women with a straightforward pregnancy are assessed to be in active labour on admission to the obstetric labour ward, commenced on and follow the Normal Labour and Birth Care Pathway

Q5 - Initial labour assessment documentation completion

In the audited case notes, the initial labour documentation was fully completed in 39% (24/62) and partially completed in 61% (38/62).

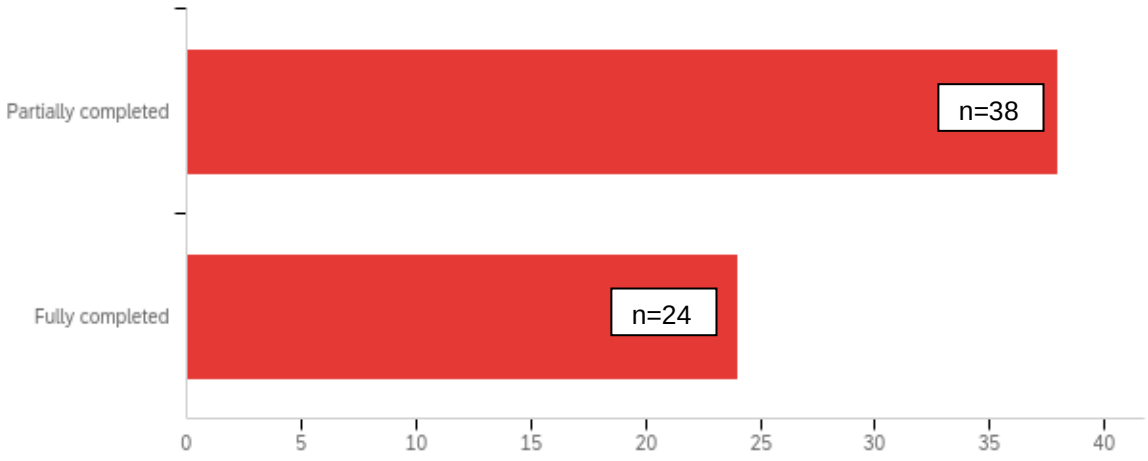


Figure No. 13: Initial Labour Documentation completed

Q6 - Documented that pathway was commenced

In the audited case notes, it was documented that the pathway was commenced in 15% (9/62) and not documented that the pathway was commenced in 85% (53/62).

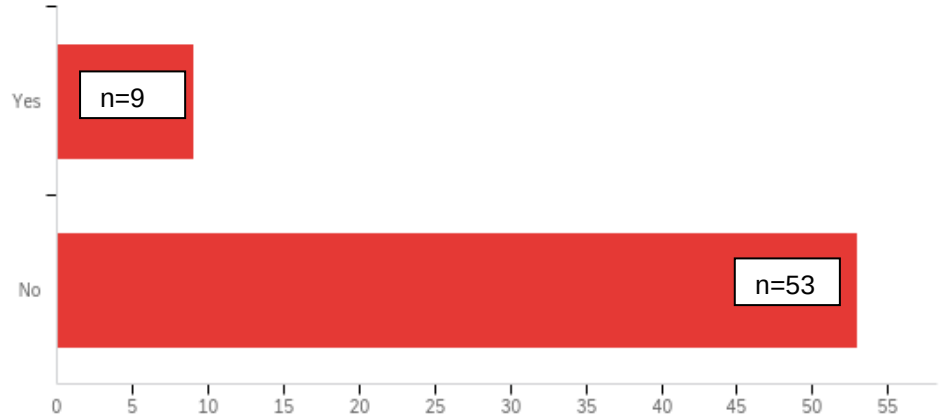


Figure No. 14: Documented that pathway was commenced

Q7 - Documented that midwife cared for woman both antenatally and during labour

It was documented in the audited case notes that women were cared for by the same midwife antenatally and in labour in 61% (38/62) of the cases. In 39% (24/62) of the cases, the women were cared for during labour by a midwife who had not also cared for them antenatally.

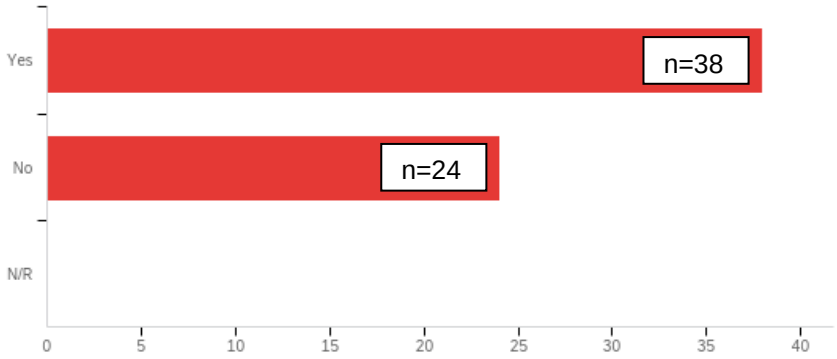


Figure No. 15: Documented that midwife cared for woman both antenatally and during labour

Q8 - Was it offered/facilitated for a partner(s) to stay overnight? Was food and hydration offered to the woman in labour?

Whether or not more than one birth partner was offered and facilitated was not recorded in 94% (58/62) of the notes and an overnight stay for a significant other/ birth partner was not recorded in 89% (55/62) of the notes.

It was recorded that a light diet was offered to the woman during labour in 49% (31/62) from the notes and also that hydration including isotonic drinks was offered during labour in 81% (50/62).

Table No. 63: Was it offered/facilitated for a partner(s) to stay or food and hydration?

Question	Yes	n	No	n	Not recorded (NR)	n	Not required		Total N
Was more than one birth partner offered and facilitated	2%	1	3%	2	94%	58	2%	1	62
Was overnight stay facilitated for birth partner/significant other	2%	1	5%	3	89%	55	5%	3	62
Was light diet offered during labour	48%	30	23%	14	29%	18	0%	0	62
Was hydration offered, including isotonic drinks during labour	81%	50	0%	0	19%	12	0%	0	62

Q9 - Mobilisation during labour

The most popular form of mobilisation used in labour was changing labour position 87% (54/62), with squatting on or over a bed recorded in 20% (24/62) and birthing ball in 18% (n=22/62) of the audited case notes.

Table No. 64: Mobilisation during labour

Response	%	N=62*
Changing position in labour	87%	54
Birthing ball	36%	22
Peanut ball	0 %	0
The Cub	0%	0
Birthing mats	2%	1
Combitrack	0%	0
Bean bag	0%	0
Birthing stool	2%	1
Squatting on or over the bed	39%	24
Birthing pool	23%	14
Not recorded	10%	6

More than one response was possible*

Q10 - Coping mechanisms for uterine activity

The coping mechanism in labour most often recorded in the audited case notes was Entonox 90% (56/62), then controlled breathing 66% (41/62) and immersion in water 27% (17/62).

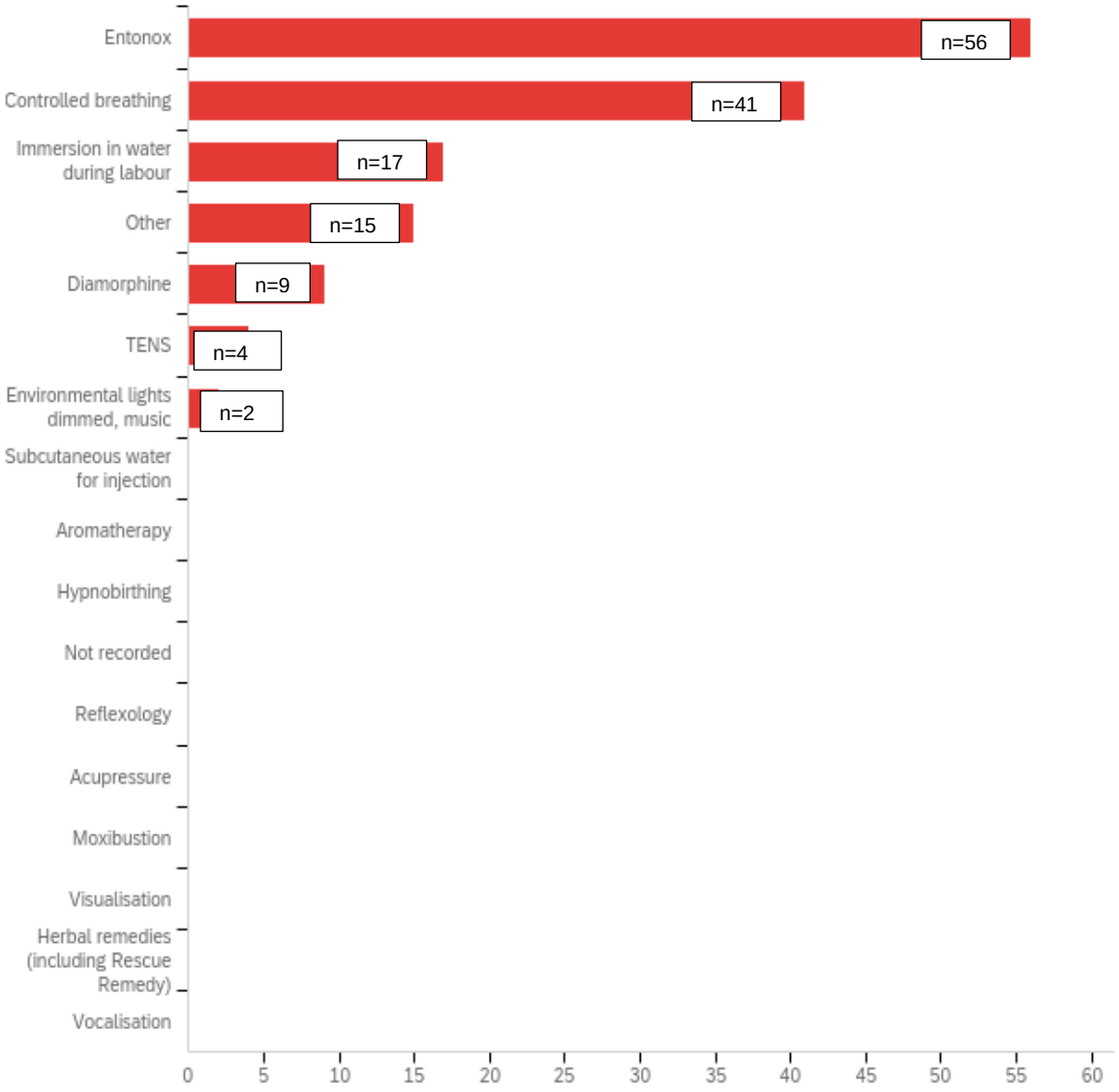


Figure No. 16: Coping mechanisms for uterine activity

Q.10 Additional Text responses for mobilisation in labour

As per Table 66 below, it was reported that four women had an epidural and one woman a spinal anaesthetic prior to cesarean section. There were also nine women who had Remifentanil as a coping mechanism for labour. The use of epidural, spinal or other forms of intravenous opioid analgesia are not associated with normal physiological birth (Healy *et al.,* 2020). They are effective analgesia methods for childbirth but can have a significant impact on the physiological hormonal and neuro hormonal processes of labour by blocking the neurotransmission from the uterus to the brain, leading to reduced oxytocin release and decreasing uterine activity (Buckley and Uvän Moberg, 2019). Data for these 14 women was removed from the subsequent analysis and audit report findings as their care deviated from the Normal Labour and Birth Care Pathway.

Subsequently, for the remainder of the report, the findings from 48 case notes are reported on.

Table No. 65: Summarised additional text responses for mobilisation in labour

Type of Intervention	Number
Epidural/*Spinal (*for 1 C/S)	5
Remifentanil (PCA)	9
Total	14

Q11 - Doula present during labour

In one of the audited case notes, it was recorded that during labour, a doula was present with the woman.

Q12 - In second stage of labour, how was progress determined?

Multiple answers were permitted and during the second stage of labour, progress was determined by more than one means: the urge to push 88% (42/48), signs of second stage 63% (30/48), the woman's behaviour 44% (21/48) and expulsive contractions 27% (13/48).

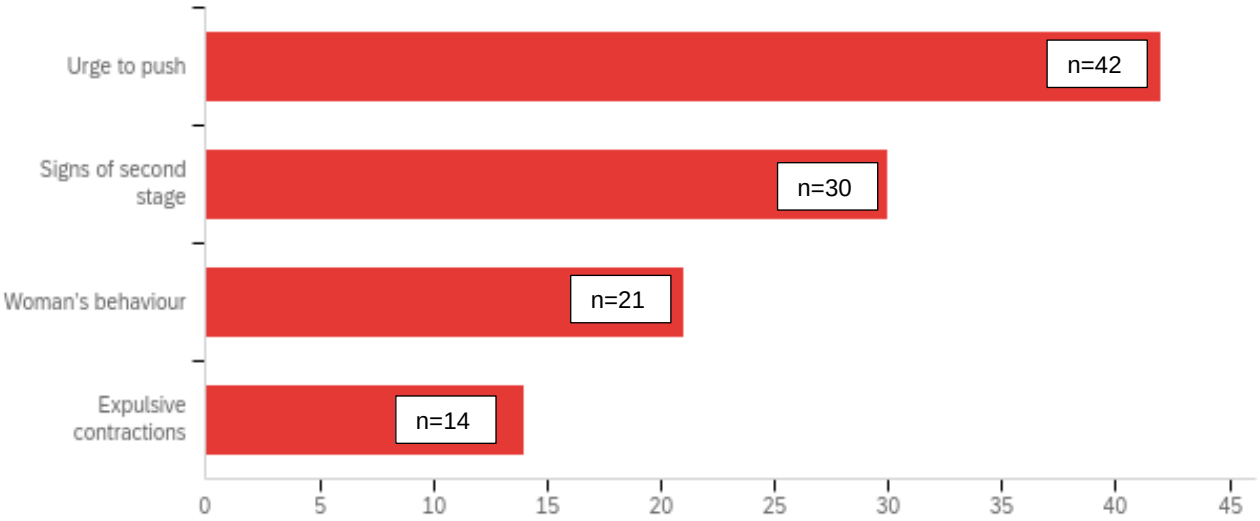


Figure No. 17: How progress was determined in second stage of labour

Q13 - Full dilatation of cervix confirmed by vaginal examination

In the audited case notes, full dilation of the cervix was confirmed by vaginal examination in 50% (n=24/48) and not by vaginal examination in 50% (24/48) of the cases.

Table No. 66: Full dilatation of cervix confirmed by vaginal examination

Response	%	N=48
Yes	50%	24
No	50%	24

Q14 - Total number of vaginal examination(s) prior to admission to obstetric labour ward (including latent phase and membrane sweeps)

The total number of vaginal examinations (VEs) prior to admission to the obstetric labour ward ranged from no VEs in 4% of cases (2/48) to four VEs in 2%(1/48) of cases. Forty eight percent (23/48) of the women in the audited case notes had two vaginal examinations before admission to the obstetric unit.

Table No. 67: Total number of vaginal examination(s) prior to admission to obstetric labour ward (including latent phase and membrane sweeps)

Response	%	N=48
0	4%	2
1	25%	12
2	48%	23
3	19%	9
4	2%	1
Other	2%	1

Q15 - Total number of vaginal examinations during active labour (first and second stage)

The total number of vaginal examinations (VEs) during active labour ranged from none in 31% (15/48) and a maximum of seven vaginal examinations recorded in one case note. Twenty seven percent (13/48) of women had one vaginal examination during active labour and 19% (9/48) had two VEs. See Table 69 below.

Table No. 68: Total number of vaginal examinations during active labour (first and second stage)

Response	%	N=48
0	31%	15
1	27%	13
2	19%	9
3	8%	4
4	8%	4
5	0%	0
6	2%	1
Other	4%	2

Q15 Other text responses re Total number of vaginal examinations during active labour (first and second stage)

In one of the audited case notes it was recorded that there were seven vaginal examinations during active labour (first and second stage).

Q16 - Frequency of vaginal examination as per pathway

In the audited case notes, the frequency of vaginal examination was recorded as being according to pathway in 33% (16/48) and not according to the pathway in 44% (21/48) of the case notes. In 23% (11/48) of the case notes, vaginal examinations were not required.

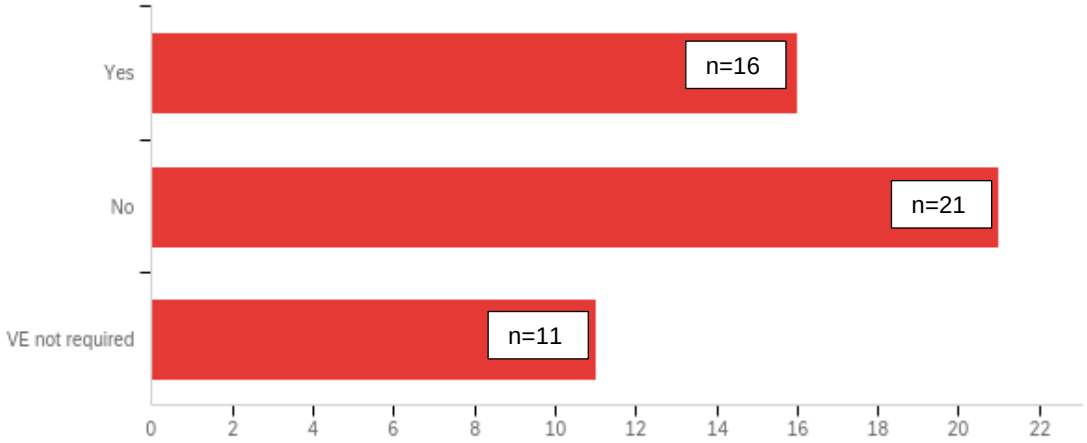


Figure No. 18: Frequency of vaginal examination as per pathway

Q17 – Was Artificial Rupture of Membranes (ARM) undertaken in line with the pathway?

Most often, it was recorded in the case notes that an ARM was not required (n=77%, n=37/48) and an ARM was undertaken in line with the pathway in 10% (n=5/48) and not in line with the pathway in 13% (n=6/48) of the case notes.

Table No. 69: ARM undertaken in line with the pathway

Response	%	N=48
Yes	10%	5
No	13%	6
ARM not required	77%	37

Q18 - Plan of intrapartum care discussed with appropriate colleague

In the case notes audited, a plan of intrapartum care was discussed with appropriate colleague in 50% (24/48) and was either not required 46% (22/48) or did not take place 4% (2/48).

Table No. 70: Plan of intrapartum care discussed with appropriate colleague

Response	%	N=48
Yes	50%	24
No	4%	2
Not required	46%	22

Q19 - Total duration of established labour and birth in hours & minutes (as noted on NIMATS)

The shortest labour for 8% (4/48) of the women in the audited case notes was less than one hour. In 21% (10/48) case notes has recorded a labour of 3-4 hours. The longest labour recorded was 17-18 hours in two of the audited case notes.

Table No. 71: Total duration of established labour and birth in hours & minutes

Labour duration (hours)	Number of cases (N=48)	%
<1	4	8
1<2	2	4
2<3	6	13
3<4	10	21
4<5	5	10
5<6	7	15
6<7	3	6
7<8	2	4
8<9	0	0
9<10	3	6
10<11	0	0
11<12	2	4
12<13	0	0
13<14	0	0
14<15	1	2
15<16	1	2
16<17	0	0
17<18	2	4

Q20 - Please provide further details on Audit Criterion 1, if appropriate

Additional comments were analysed and informed responses to questions above.

Audit Criterion 2
What were the maternal outcome indicators related to giving birth in an obstetric labour ward for the individual woman with a straightforward pregnancy?

Q21 - Mode of birth

Of the 48 women, 92% (44/48) had an unassisted cephalic vaginal birth. Eight percent (4/48) had an assisted cephalic vaginal birth two via forceps two via vacuum.

Q22 - Perineal Trauma

The most recorded common perineal trauma recorded in the audited case notes was a second degree tear 42% (20/48), with an episiotomy recorded in 21% (10/48 cases). However, some of the case notes audited, reported more than one type of perineal trauma (*accounting for 56 documented instances of perineal trauma).

Table No. 72: - Perineal trauma

Response	N=48*
Intact	9
Grazes	0
Labial	5
Peri-urethral	1
Clitoral	0
1st degree tear	9
2nd degree tear	20
Episiotomy	10
3rd degree tear	0
4th degree tear	0
Vaginal laceration	2

Q23 - Perineal Suturing

Perineal suturing was required in 77% (37/48) of the audited case notes and as not required in the remaining 23% (11/48) case notes.

Table No. 73: - Perineal Suturing

Response	%	N=48
Not required	26%	11
Performed	77%	37
Required but not initially identified	0%	0
Woman declined	0%	0

Q24 - Skin to skin

Skin to skin contact for the woman and her baby for the duration of at least one hour was recorded in 19% (9/48) of the case notes. In the majority of case notes, skin to skin contact between mother and baby was undertaken but the time frame was not recorded 46% (22/48).

Table No. 74: - Skin to skin duration

Response	%	N=48
< 15 minutes	15%	7
< 30 minutes	6%	3
30 - 60 minutes	8%	4
> 1 hour	19%	9
Not recorded	6%	3
Skin to skin undertaken but time frame not recorded	46%	22

Q25 - Breastfeeding initiated at birth

In the audited case notes, it was recorded that 58% (28/48) of women and babies initiated breastfeeding at birth.

Table No. 75: Breastfeeding initiated at birth

Response	%	N=48
Yes	58%	28
No	40%	19
N/R	2%	1

Q26 - Breastfeeding on discharge home

In the audited case notes, it was recorded that 52% (25/48) of women and babies were breastfeeding on discharge home.

Table No. 76: Breastfeeding on discharge home

Response	%	N=48
Yes	52%	25
No	40%	19
N/R	8%	4

Q27 - Responsive infant feeding by woman (including formula feeding)

In the audited case notes, responsive feeding was undertaken by 100% (n=48/48).

Table No. 77: Responsive infant feeding by woman (including formula feeding)

Response	%	N=48
Yes	100%	48
No	0.00%	0

Q28 - IV cannulation with no indication

In the audited case notes, 44% (21/48) of women did not have IV cannulation recorded without an indication and for 56% (27/48) of the cases, it was considered not applicable.

Table No. 78: IV cannulation with no indication

Response	%	N=48
Yes	0%	0
No	44%	21
N/A	56%	27

Q29 - Urinary catheterisation during labour

In the audited case notes, urinary catheterisation was not required for 83% (40/48) of women. Thirteen percent (6/48) of the women in the audited case notes required intermittent catheterisation and 4% (2/48) of the women in the audited case notes required an indwelling catheter.

Table No. 79: Urinary catheterisation during labour

Response	%	N=48
Intermittent	13%	6
Indwelling	4%	2
Not required	83%	40

Q30 - Management of 3rd stage of labour

In the audited case notes, 96% (46/48) of the women had active management of the third stage of labour.

Table No. 80: Management of 3rd stage of labour

Response	%	Count
Physiological	4%	2
Active management	96%	46
Physiological followed by active management	0%	0

Q31 - Significant postnatal blood loss

The majority of the women in the audited case notes did not have a significant postnatal blood loss 94% (45/48).

Table No. 81: Significant postnatal blood loss

Response	%	N=48
> 500mls not requiring intervention	4%	2
>500mls requiring midwifery intervention	0%	0
> 500mls requiring medical intervention	2%	1
N/A	94%	45

Q32 - Obstetric emergency

In the audited case notes, there were no obstetric emergencies recorded.

Q32 Obstetric emergency- additional text

In one case note, it was recorded that the woman had fainted in the pool.

Q33 – Significant other stayed with woman postnatally in the maternity unit

In both of the units audited, it is not policy for the significant other/birth partner to stay with the woman and baby postnatally.

Q34 - Number of different caregivers during labour and birth (across breaks / shift changes; including medical / midwifery students) See signature page on MHHR

Over half the women had one to two caregivers 65% (31/48). Forty two percent (20/48) of women had two different caregivers during labour and birth, with 23% (11/48) of case notes having recorded only one caregiver.

Table No. 82: Number of different caregivers during labour and birth

Number of caregivers	Cases n=48	%
1	11	23
2	20	42
3	9	19
4	3	6
5	2	4
6	1	2
7	0	0
8	1	2
9	1	2

Q35 - Additional comments re Criterion 2

Additional comments were analysed and informed responses to the questions above.

Audit Criterion 3

Further to a straightforward pregnancy, what were the neonatal outcome indicators related to being birthed in an obstetric labour ward?

Q36 - Birth

In all of the audited case notes, live births were recorded.

Q37 - Birth Weight of Babies

Forty two percent (20/48) of the babies weights in the audited case notes were between 3500-3999 grams.

Table No. 83: Birthweight of babies recorded in audited case notes

Response	%	N=48
<2,500g	2%	1
2,500 - 2,999g	4%	2
3000 - 3499g	29%	14
3500 - 3999g	42%	20
4000 - 4999g	23%	11
>5000g	0%	0

Q38 - Birth Centile

Expected and actual birth centiles were recorded in all the audited cases notes (n=48). No babies had a birth centile less than 10th Centile and six babies had a birth centile greater than 90th centile.

Table No. 84: No. of babies with actual birth < 10th centile and >90th centile

Response	<10th centile	>90th Centile
Number of babies	0	6

Q39 - Skin to skin with significant other (other than the mother)

In 96% (46/48) of the case notes skin to skin with significant other (other than the mother) was not recorded.

Table No. 85: Skin to skin with significant other (other than the mother)

Response	%	N=48
Yes	4 %	2
No	0%	0
N/R	96%	46

Q40 - Additional baby care required

In the audited case notes, additional baby care was not required by 88% (42/48) of the babies.

Table No. 86: Additional Baby Care Required

Response	%	N=48
None	88%	42
Admission to SCBU	0%	0
Admission to NICU	0%	0
Admitted to postnatal ward for further baby care observations	6%	3
Admitted to postnatal ward for further baby care interventions (phototherapy, IV antibiotics)	2%	1
Other	4%	2

Q40 Comments on other additional baby care required

Some additional comments included a baby being reviewed by a paediatrician for a mark on their temple and one neonatal investigation for transient bradycardia - no further care required.

Q41 - Optimal cord clamping ("Wait for White" following physiological 3rd stage of labour)

In the audited case notes, optimal cord clamping was recorded as having taken place in 17% (8/48) of the births.

Table No. 87: Optimal cord clamping ("Wait for White" following physiological 3rd stage of labour)

Response	%	N=48
Yes	17%	8
No	48%	23
N/R	35%	17

Q42 - Delayed cord clamping following active management of 3rd stage of labour –

Of those women who had active management of 3rd stage, 55% (22/40) had the cord clamped at more than one minute.

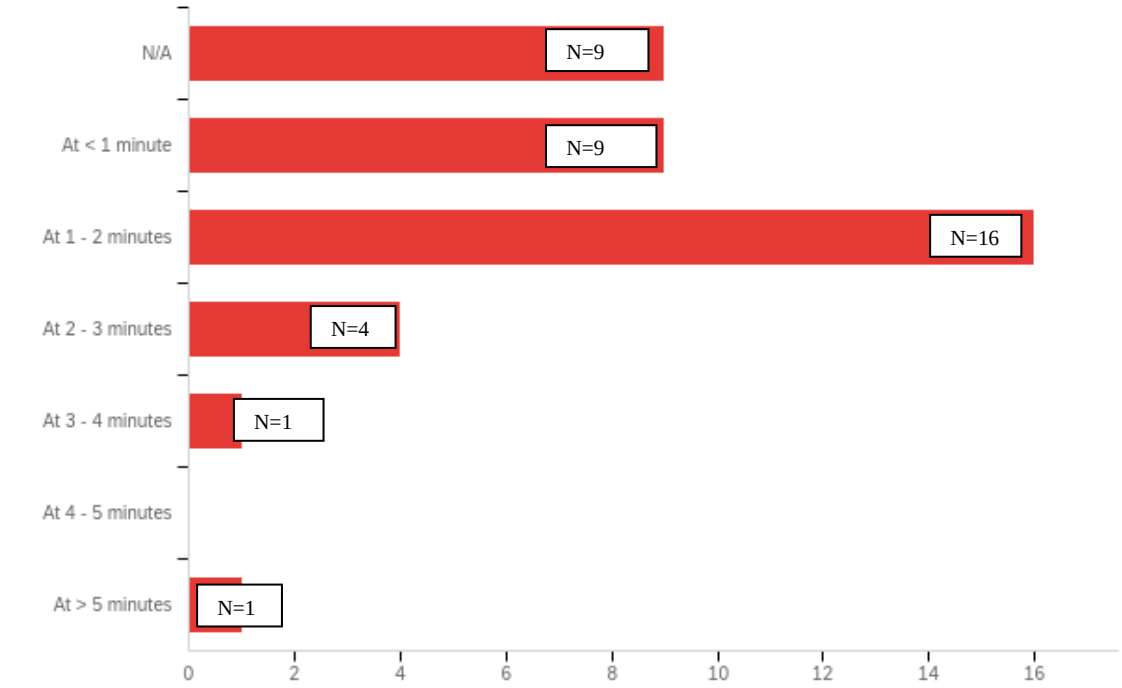


Figure No. 19: Delayed cord clamping following active management of 3rd stage of labour

Table No. 88: Delayed cord clamping following active management of 3rd stage of labour

Response	%	N=40
N/A	23%	9
At < 1 minute	23%	9
At 1 - 2 minutes	40%	16
At 2 - 3 minutes	10%	4
At 3 - 4 minutes	3%	1
At 4 - 5 minutes	0%	0
At > 5 minutes	3%	1

Q43 - Was neonatal resuscitation required

In the audited case notes, neonatal resuscitation was not required for 96% (46/48) of the babies.

Table No. 89: Neonatal Resuscitation required

Response	%	N=48*
No	96%	46
Stimulation	0%	0
Inflation breaths	4%	2
Ventilation breaths	0%	0
Cardiac compressions	0%	0
Intubation	0%	0
Umbilical catheterisation	0%	0
Medication	2%	1

(*more than one answer applied)

Q44 - If resuscitation was required, was umbilical cord intact during resuscitation (for example inflation breaths)?

In the two cases where resuscitation was required, it was recorded that the cord was not intact during resuscitation. The resuscitation was as noted above - inflation breaths in two cases and medication in one of those two cases.

Table No. 90: Umbilical cord intact during resuscitation

Response	%	N=2
Yes	0%	0
No	100%	2
N/R	0%	0

Q45 - APGAR at 5 minutes

In 100% (48/48) of the case notes audited recorded an APGAR score of 9-10 at 5 minutes for each baby.

Q46 - Umbilical cord pHs recorded:

Umbilical cord pHs were not required in 81% (39/48) cases.

Table No. 91: Umbilical cord pHs recorded

Response	%	N=48
Not required	81%	39
Required, but not performed	8%	4
Performed, but not required	4%	2
Impossible to perform (e.g. blood gas analyser unavailable)	6%	3

Q47 - Significant infant birth trauma noted (written in notes or marked on Body Map) If yes, please give details

Significant infant trauma was recorded in six of the audited case notes.

Table No. 92: Significant infant birth trauma noted (written in notes or marked on Body Map)

Answer	%	N=48
Yes	13%	6
No	88%	42

Q47 Significant infant birth trauma noted (written in notes or marked on Body Map)

Additional text responses included one forceps marks; one vacuum mark, chignon on baby's head from kiwi extraction, a superficial scalp abrasion and bruising and one mark on the temple.

Q48 - Undiagnosed fetal abnormality

There was no record of an undiagnosed fetal abnormality in the audited case notes.

Q49 - Please provide further details on Audit Criterion 3

Additional comments were analysed and informed responses to questions above.

Audit Criterion 4
All women with a straightforward pregnancy who required transfer to another obstetric Unit or ICU are transferred and rationale provided

Q50 - Was the women transferred to another obstetric unit or ICU?

None of the women in the cases notes that were audited were transferred to another obstetric unit or ICU.

Q51 - Rationale for transfer documented

As none of the women in the audited case notes were transferred, rationale for transfer not recorded.

Q51 Text responses in relation to rationale for transfer

No other text was recorded in relation to transfer as no transfers took place.

Q52 - Woman transferred during labour or postnatally to another obstetric or ICU

None of the women in the case notes audited were transferred during labour or postnatally.

Q53 - Rationale for transfer of woman

As none of the women in the audited case notes were transferred, rationale for transfer was not recorded.

Q53 Other maternal or neonatal reasons for transfer

As none of the women in the audited case notes were transferred, no free text responses were recorded.

Q54 - Transfer urgency

As none of the women in the audited case notes were transferred, information re transfer urgency was not recorded.

Q55 - Transfer duration time (from ambulance called to arrival at other Obstetric Unit/ICU)

As none of the women in the audited case notes were transferred, information re transfer time was not recorded.

Q56 - Length of time from arrival at other Obstetric Unit/ICU to handover of care

As none of the women in the audited case notes were transferred, handover times were not recorded.

Q57 - Please provide further details on Audit Criterion 4

No further details on Audit Criterion 4 were provided.

Observations of outcomes in relation to the Audits:

Northern Ireland Regional Individual MLU audit,Regional Case Audit of the RQIA Guideline for Admission to MLUs in Northern Ireland & Northern Ireland Normal Labour and Birth Care Pathway (within MLU) and the Audit of Normal Labour and Birth Care Pathway within an Obstetric Unit

Areas of good practice:

- 95% of women met the criteria outlined in the RQIA guideline for admission to MLU.
- Majority of women who required an individualised care plan for admission to MLU 64% (9/14) had one developed.
- When an ARM was required this was undertaken appropriately in 94% of cases, in line with the Northern Ireland Normal and Labour Birth Care Pathway.
- Increased initiation and discharge breastfeeding rates for women birthing in MLUs compared to regional breastfeeding rates for all birth settings.
- 98-100% of women undertook responsive infant feeding (including formula feeding).
- Compared to birthing in an obstetric unit with no MLU service, women with a straightforward pregnancy giving birth in a MLU are much more likely to mobilise in labour and adopt upright positions using birthing aids for support and more likely to use water for labour and birth (see data on page 60 and page 88).

Areas for improvement:

- Mother to baby skin to skin for one-hour uninterrupted following birth for all MLUs should be facilitated and clearly documented. In particular, reasons for why mother to baby skin to skin may have been interrupted.
- Increase facilitation of mobilisation in the second stage of labour, i.e. sacrum free position for birth to enable physiological opening of the pelvic outlet.
- To optimise the use of the Northern Ireland Normal labour and birth Care Pathway (which is included in the maternity handheld records), all staff should be trained regarding the requirement to complete the documentation for all women who have had a straightforward pregnancy.

- Full completion of documentation for all women to include: birth preferences, individualised pathway if woman did not meet admission criteria, labour assessment, whether normal labour and birth care pathway was commenced or deviated from and completion of appropriate transfer proforma (if required). The proformas for completion are: *Northern Ireland Midwife-led Care HART Referral and / or Transfer Report Form* – (*click for link)* For use: between midwife-led care settings, including home birth or from midwifery led units to Obstetric unit.
  Northern Ireland Maternal Transfer Proforma – (*click for link)* For use when transferring a woman from one obstetric unit to another, or to another hospital, ICU or outside Northern Ireland

Presentation/Discussion

Disseminated will be via RQIA website, relevant conferences and publication.

Recommendations

1. By January 2022*: Commencement of a* review of the current evidence and update the RQIA *Guideline for Admission to Midwife-Led Units (MLUs) in Northern Ireland, the Northern Ireland Normal Labour and Birth Care Pathway and the Women/Partner/Significant other Resource Leaflet.* In addition, development of best practice guidance on individualised care planning for women who do not meet the guideline for admission to MLUs. This is essential as new evidence continues to be published.
2. There is an immediate need to raise the profile of MLUs as an evidenced based choice of place of birth for all women with a straightforward pregnancy across Northern Ireland. This can continue to be actioned using all public health platforms and via maternity care providers during each maternity care contact.
3. There is also an immediate need for the outcomes and evidence relating to birthing in all birth settings to be made more accessible to women and their partners through a wider range of platforms, to inform their choice of place of birth. MLU self-referral form should be accessible and made available to

all women. Click on link below for access to the relevant Trust self-referral form.

https://belfasttrust.hscni.net/services/maternity/pregnancy-journey/self-referral-form/
http://www.northerntrust.hscni.net/services/maternity-services/babyandu/
https://setrust.hscni.net/service/maternity-2/
https://southerntrust.hscni.net/services/maternity-services/
https://westerntrust.hscni.net/service/maternity-services/

4. By January 2022, ensure that there are consistent categories of data collated from each MLU in relation to the care provision, maternal and neonatal outcomes. NIMATS or the proposed new regional health data system needs to be designed to enable recording of the agreed maternal and neonatal outcome data to be collated.
5. By January 2023: Where each obstetric unit is located, a midwife-led unit(s) (AMU) should be commissioned, and where appropriate an FMU; thereby providing MLU service provision for all women with a straightforward pregnancy in Northern Ireland.
6. By September 2022: All MLUs should have completed Midwifery Unit Standards Self-assessment Tool (Midwifery Unit Standards, 2019) and developed an improvement action plan. These action plans should include work force planning to optimise staffing in MLUs to ensure staff shortages in Obstetric units do not normally impact on care provision in an MLU. Also that Trust wide evidence informed policies are developed, for example - that one significant other can stay with woman in MLU postnatally (if woman's choice).
7. By September 2021: Establish a midwife-led unit network across Northern Ireland to share evidenced-based good practice and decrease variability of practice/ performance across MLUs.
8. By September 2022: Explore women's experiences of birthing in midwife-led units in Northern Ireland, as it is important to research women's MLU care experiences.
9. By April 2023: Undertake a re-audit of the Regional Individual MLU audit, Regional Case Audit of the RQIA Guideline for Admission to Midwife-Led Units in Northern Ireland & Case Audit of Northern Ireland Normal Labour and Birth Care Pathway within Midwife-led Units and Obstetric Units.

Project Number:

KEY (Change status)
1 Recommendation agreed but not yet actioned
2 Action in progress
3 Recommendation fully implemented
4 Recommendation never actioned (please state reasons)
5 Other (please provide supporting information)

Clinical Audit Action Plan

Project title	**Regional Individual MLU Audit, Regional Case Audit of the RQIA Guideline for Admission to Midwife-Led Units in Northern Ireland & Case Audit of Northern Ireland Normal Labour and Birth Care Pathway within Midwife-led Units and Obstetric Units**

Recommendation	**Actions Required** *(specify "None", if none required)*	**Action by Date**	**Person Responsible** *(Name and grade)*	**Comments/Action Status**	**Change Stage** (see Key)
1. A review of the current evidence and update the RQIA Guideline for Admission to Midwife-Led Units (MLUs) in Northern Ireland, the Northern Ireland Normal Labour and Birth Care Pathway and the Women/Partner/Significant other Resource Leaflet. In addition, development of best practice guidance on individualised care planning for women who do not meet the guideline for admission to MLUs.	Apply for funding to appropriate funder e.g. RQIA and undertake review and update of guideline, pathway and resource leaflet.	January 2022	Dr Maria Healy & colleagues in collaboration with key maternity care stakeholders		
2. There is an immediate need to raise the profile of MLUs as an evidenced based choice of place of birth for all women with a straightforward pregnancy across Northern Ireland. This can continue to be	Raising the profile of MLUs and active promotion on all Public Health and maternity care platforms including: promotional videos, virtual visiting tours of MLUs and	October 2021	Dr Maria Healy in collaboration with PHA, Heads of midwifery, midwives in co-production with women advocacy groups		

actioned using all public health platforms and via maternity care providers during each maternity care contact.	information education and provision by maternity care providers during each maternity care contact.				
3. There is also an immediate need for the outcomes and evidence relating to birthing in all birth settings to be made more accessible to women and their partners through a wider range of platforms, to inform their choice of place of birth. MLU self-referral form should be accessible and made available to all women	Make accessible the outcomes and evidence relating to birthing in all birth settings to women and their partners through a wider range of platforms, to inform their choice of place of birth. MLU self-referral form should be accessible and made available to all women	October 2021	Dr Maria Healy in collaboration with PHA, Heads of midwifery, midwives in co-production with women advocacy groups		
4. By January 2022, ensure that there are consistent categories of data collated from each MLU in relation to the care provision, maternal and neonatal outcomes. NIMATS or the proposed new regional health data system needs to be designed to enable recording of the agreed maternal and neonatal outcome data to be collated.	Agreement of the consistent type and categories of data to be collated from each MLU in relation to the care provision, maternal and neonatal outcomes.	January 2022	Dr Maria Healy in collaboration with PHA, Heads of midwifery, NIMATS Managers, midwives in co-production with women advocacy groups		
5. By January 2023: Where each obstetric unit is located, a midwife-led unit(s) (AMU) should be commissioned, and where appropriate an	Infrastructure and resource funding	January 2023	HSC Trust Boards in particular, NHSC Trust board		

FMU; thereby providing MLU service provision for all women with a straightforward pregnancy in Northern Ireland.					
6. By September 2022: All MLUs should have completed Midwifery Unit Standards Self-assessment Tool (Midwifery Unit Standards, 2019) and developed an action plan. These action plans should include work force planning to optimise staffing in MLUs to ensure staff shortages in Obstetric units do not normally impact on care provision in an MLU. Also that Trust wide evidence informed policies are developed, for example - that one significant other can stay with woman in MLU postnatally (if woman's choice).	Each MLU to complete *Midwifery Unit Standards Self-assessment Tool* and develop action plan for quality improvement.	September 2022	Heads of Midwifery /Midwife managers in MLUs		
7. By September 2021: Establish a midwife-led unit/care network across Northern Ireland to share evidenced-based good practice and decrease variability of practice/ performance across MLUs.	Apply for funding from appropriate funder and establish midwife-led unit network	September 2021	Dr Maria Healy & colleagues in collaboration with key maternity care stakeholders		
8. Explore women's experiences of birthing in midwife-led	Apply for funding from appropriate	September 2022	Collaboration with key maternity care		

	units in Northern Ireland, as it is important to research women's MLU care experiences.	funder		stakeholders		
9.	Undertake a re-audit of the Regional Individual MLU audit, Regional Case Audit of the RQIA Guideline for Admission to Midwife-Led Units in Northern Ireland & Case Audit of Northern Ireland Normal Labour and Birth Care Pathway within Midwife-led Units and Obstetric Units.	Apply for funding from appropriate funder e.g. RQIA	April 2023	Dr Maria Healy & colleagues in collaboration with key maternity care stakeholders		

Project Team

Name	Job Title/Specialty	Trust or Employer	Role within Project (data collection, Supervisor etc)
Project Lead			
Dr Maria Healy	Lecturer in Midwifery	Queen's University Belfast	Project Lead
Deputy Project Lead			
Dr Patricia Gillen	Head of Research and Development for Nurses, Midwives and AHPs (SHSCT) / Reader (Ulster University)	Southern Health and Social Care Trust / Ulster University	Deputy Project Lead
Project Team			
Dr Julie McCullough	Research Associate	Ulster University	Project Team Member
Dr Jennifer McKenna (From June 2019 Until March 2020)	Lecturer in Midwifery	Queen's University Belfast	Project Team Member
Steering Group Members			
Dr Caroline Bryson	Consultant Obstetrician & Gynaecologist	South Eastern Health and Social Care Trust	Steering Group Member
Ms Fiona Bradley	Senior Professional Officer	Northern Ireland Practice and Education Council for Nursing and Midwifery (NIPEC)	Steering Group Member
Ms Wendy Clarke	Head of Midwifery	Southern Health and Social Care Trust	Steering Group Member
Ms Roisin Cosgrove	Lead Midwife	Belfast Health and Social Care Trust	Steering Group Member
Ms Caroline Diamond	Head of Midwifery	Northern Health and Social Care Trust	Steering Group Member
Ms Una Farmer	Lead Midwife	Western Health and Social Care Trust	Steering Group Member
Ms Shona Hamilton	Consultant Midwife	Northern Health and Social Care Trust	Steering Group Member
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Ms Brenda Kelly	Head of Midwifery	Belfast Health and Social Care Trust	Steering Group Member

Dr Alison Little	Midwife Consultant	Public Health Agency	Steering Group Member
Ms Maureen Miller	Head of Midwifery	Western Health and Social Care Trust	Steering Group Member
Ms Gillian Morrow	Midwife-Led Unit Manager	Belfast Health and Social Care Trust	Steering Group Member and Data Collectors Group Member
Ms Karen Murray	RCM Director for Northern Ireland.	RCM Northern Ireland	Steering Group Member
Ms Fionnuala Mc Cluskey	Head of Midwifery	South Eastern Health and Social Care Trust	Steering Group Member
Ms Michelle Portis	Lead Midwife	South Eastern Health and Social Care Trust	Steering Group Member
Ms Margaret Rogan	Consultant Midwife	Belfast Health and Social Care Trust	Steering Group Member
Ms Amanda Sayers	Lead Midwife	Western Health and Social Care Trust	Steering Group Member
Dr Dale Spence	Midwife Advisor	Department of Health, NI	Steering Group Member
Ms Seána Talbot	Maternity & Neonatal Service Manager	Belfast Health and Social Care Trust	Steering Group Member
Ms Maureen Ritchie	Lead Midwife	South Eastern Health and Social Care Trust	Steering Group Member
Ms Ruth Young	PPI Representative		Steering Group Member
Data Collectors			
Ms Nicola Babes	Midwife	South Eastern Health and Social Care Trust	Data Collectors Group Member
Ms Donna Blake	Midwife	Western Health and Social Care Trust	Data Collectors Group Member
Ms Jasmine Callow	Midwife-Led Unit Manager	Belfast Health and Social Care Trust	Data Collectors Group Member
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Ms Leanne Hughes	Midwife-Led Unit Manager	Western Health and Social Care Trust	Data Collectors Group Member

Ms Carol McGirr	Midwife	South Eastern Health and Social Care Trust	Data Collectors Group Member
Ms Valerie Porter	Midwife-Led Unit Manger	Southern Health and Social Care Trust	Data Collectors Group Member
Ms Andrea Prichard	Midwife	Southern Health and Social Care Trust	Data Collectors Group Member
Ms Katherine Robinson	Midwife-Led Unit Manager	South Eastern Health and Social Care Trust	Data Collectors Group Member
Ms Pauline Topping	Midwife	Southern Health and Social Care Trust	Data Collectors Group Member
Ms Helen Weir	Midwife Unit Manager	Northern Health and Social Care Trust	Data Collectors Group Member
External Peer Reviewer			
Dr Lucia Rocca-Ihenacho	Lecturer in Midwifery	City University London	External Peer Reviewer
RQIA			
Robert Mercer	Regional Clinical Audit Facilitator Improvement Directorate	Regulation and Quality Improvement Authority (RQIA)	RQIA Rep on both Steering Group Member & Data Collectors Group Member
Dr Leanne Morgan	RQIA	Regulation and Quality Improvement Authority (RQIA)	Steering Group Member

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Abbreviations

AMU	Alongside midwife-led Unit
CS	Caesarean section
EMA	European Midwives Association,
FMU	Freestanding midwife-led unit
ICM	International Confederation of Midwives
MANA	Midwives Alliance of North America
MLU	Midwife-led Unit (AMU & FMU)
MLBS	Midwife-led birth settings (AMU, FMU, Home birth & Obstetric Unit)
MSIG	Maternity Strategy Implementation Group
NICU	Neonatal Intensive Care Unit
NIMATS	Northern Ireland Maternity System
RCM	Royal College of Midwives
SCBU	Special Care Baby Unit
WHO	World Health Organisation (WHO)

Appendices

Appendix 1 - RQIA Individual MLU AUDIT TOOL

ABOUT THIS AUDIT TOOL - **RQIA Individual MLU AUDIT -** The audit criteria and the associated evidence/actions contained in this audit tool are based on the following: the Regulation Quality Improvement Authority (RQIA, 2016) *Guideline for Admission to Midwife-Led Units in Northern Ireland and the Northern Ireland Normal Labour and Birth Care Pathway*; National Institute for Health and Care Excellence, *Intrapartum Care for Healthy Women and Babies* (NICE 2014, 2017); and the Maternity Strategy for Northern Ireland 2012 (DOH, 2012). The criteria are also informed by best international practice evidence in relation to admission to Midwife-Led Units and Pathway of Care for Normal Labour and Birth; including the FIGO (2015) guidelines for Mother baby friendly birthing facilities (https://www.whiteribbonalliance.org/wp-content/uploads/2017/11/MBFBF-guidelines.pdf).

This audit tool is designed to collate audit data from individual Midwife-Led Units in Northern Ireland, as part of the RQIA Regional Audit of the RQIA Guideline for Admission to Midwife-Led Units in Northern Ireland & Northern Ireland Normal Labour and Birth Care Pathway.

The audit data period relates to the individual years 2015 and 2018, from 1st January to 31st December of each year. The audit tool should be completed by an authorised person only**.** The project audit team includes: Dr Maria Healy QUB, Dr Patricia Gillen SHSCT & UU, & Dr Julie McCullough UU in collaboration with maternity care service users and colleagues. You are able to access this data collection tool as you are one of the data collectors in either: SEHSCT, SHSCT, BHSCT or WHSCT.

At various stages, throughout the audit tool, there are some additional text spaces where you can include further information, if needed. The audit does not have to be completed all at once, it is possible to leave the audit tool and return to it later as it is automatically saved as you progress through it. However, once you have clicked 'submit my answers' followed by 'next', the audit will be submitted, and no further changes will be possible. If you are having difficulty while completing the survey, please contact Dr Maria Healy maria.healy@qub.ac.uk stating your telephone contact details who will get back to you as soon as possible.

Thank you for completing this audit tool!

Enter **MLU data** from 1st January to 31st December of each year (2015 and 2018):

Enter the name of the MLU below:

_____

MLU policies:

Does the Trust policy include the following options?

	Yes (1)	No (2)
More than one birth partner offered and facilitated (1)	○	○
Overnight stay facilitated for significant other (2)	○	○
Light diet and hydration offered, including isotonic drinks (3)	○	○

Enter MLU data regarding **infant feeding** from 1st January to 31st December of each year (please write N/R in box if not recorded):

	2015 (1)	2018 (2)
Number of women who chose to initiate breastfeeding their baby (1)		
Number of women who chose to breastfeed their baby on discharge home (2)		
Number of women who chose to formula feed their baby on discharge home (3)		
Number of women who chose mixed feeding i.e breast and formula, on discharge home (4)		

Enter **MLU data** from 1st January to 31st December of each year (please write N/R in box if not recorded):	2015	2018
Number of women who had physiological 3rd stage of labour (1)		
Number of women who had intact perineum / grazes: **Primips** (2)		
Number of women who had intact perineum / grazes: **Multips** (3)		
Number of women who had urethral / clitoral / labial tear (4)		
Number of women who experienced first degree tear (10)		
Number of women who experienced second degree tear (5)		
Number of women who had third degree tear (7)		
Number of women who started labour in MLU & had an episiotomy (6)		

Number of women who had third degree tear in water (8)		
Number of women who had fourth degree tear (9)		
Vaginal lacerations (11)		
Maternal Outcomes From 1st January to 31st December for each year (please write N/R in box if not recorded):	2015	2018
Number of women who had Instrumental Delivery in MLU per year (1)		
Number of women who transferred to Obstetric Unit (4)		
Maternal Outcomes Please enter the reasons women transferred to Obstetric Unit (or other unit), from 1st January to 31st December for each year (please write N/R in box if not recorded):	2015	2018
Pain relief (3)		
Delay in labour progress (4)		

Non-significant meconium (5)		
Significant meconium (6)		
Undiagnosed breech (7)		
Sepsis (8)		
APH (17)		
PPH (9)		
Manual removal of placenta (MROP) (10)		
Pre-eclampsia / eclampsia (11)		
Umbilical cord prolapse (12)		
Shoulder dystocia (13)		
Abnormal fetal heart rate (14)		
Maternal choice (15)		

Other, please provide details (16)		
Other,please provide details (18)		
Maternal Outcomes <u>following transfer to Obstetric Unit</u> (or other unit) (please write N/R in box if not recorded):	2015	2018
Normal Vaginal Delivery (NVD) (1)		
Acceleration of labour with IV Syntocinon (2)		
Epidural (3)		
Urinary catheterisation (4)		
Vacuum extraction (5)		
Forceps birth (6)		
Episiotomy (7)		
Perineal trauma 1st / 2nd degree (8)		

Perineal trauma 3rd / 4th degree (9)		
Caesarean Section (10)		
Admission to ICU (11)		
Maternal death (12)		
Other, please provide details (13)		
Other, please provide details (14)		
Neonatal Outcomes Please enter the number of babies admitted to NICU or SCBU (or other) from 1st January to 31st December for each year (please write NR in box if not recorded):	2015	2018
Number of babies admitted to NICU or SCBU per year from MLU (1)		
Number of babies admitted to Other, please state where baby was admitted (4)		

Neonatal Outcomes Please enter the reasons for babies being admitted to NICU or SCBU (or other) from 1st January to 31st December for each year (please write N/R in box if not recorded):	2015	2018
Hypothermia (2)		
Transient Tachypnoea of the Newborn (TTN) (3)		
Feeding difficulties / hypoglycaemia (4)		
Sepsis (5)		
IV antibiotics (6)		
Congenital abnormality (7)		
Low birthweight (8)		
Phototherapy (9)		
Low APGAR ((10)		

Neonatal death (12)		
Other, please provide details (11)		
Other, please provide details (13)		

Reason for admission to NICU or SCBU (or other) - provide further details if reason not listed above:

_____

If you have now inputted, all of the MLU data for both years, please click 'submit my answers' followed by 'next', but only when you are sure that you don't want to make any changes, and move to the exit screen, thank you.

- ○ Submit my answers (1)

Skip To: End of Survey, please click 'submit my answers

Appendix 2: Audit Tool: Regional Case Audit of the RQIA Guideline for Admission to MLUs in Northern Ireland & Northern Ireland Normal Labour and Birth Care Pathway

Regional Case Audit of the RQIA Admission to MLUs & Normal Labour & Birth Care Pathway The audit criteria and their associated evidence/actions contained in this audit tool are based on the following: the Regulation Quality Improvement Authority (RQIA, 2016) Guideline for Admission to Midwife-Led Units in Northern Ireland and the Northern Ireland Normal Labour and Birth Care Pathway; National Institute for Health and Care Excellence Intrapartum Care for Healthy Women and Babies (NICE 2014, 2017); and the Maternity Strategy for Northern Ireland 2012 (DOH, 2012). The criteria are also informed by best international practice evidence in relation to admission to Midwife-Led Units and Pathway of Care for Normal Labour and Birth; including the FIGO (2015) guidelines for Mother baby friendly birthing facilities (https://www.whiteribbonalliance.org/wp-content/uploads/2017/11/MBFBF-guidelines.pdf).

This audit tool is designed for use in the Regional Case Audit of the RQIA Guideline for Admission to Midwife-led Units in Northern Ireland & the Northern Ireland Normal Labour and Birth Care Pathway. The project audit team includes: Dr Maria Healy QUB, Dr Patricia Gillen SHSCT & UU, & Dr Julie

McCullough UU in collaboration with maternity service users and colleagues.

The audit data is being collected from randomly selected case notes of women who were admitted to an MLU from 1st January to 31st December 2018. This audit tool should be completed by an authorised person only! You are able to access this audit tool as you are one of the data collectors for this project in either: SEHSCT, SHSCT, BHSCT or WHSCT. There are 6 criteria being assessed in this audit called Criterion 1-6. Each criterion is stated and then followed by a number of questions. At various stages, throughout the audit there are some additional text spaces where you can include further information, if needed. Please complete all of the questions in as much detail as possible. Some questions have an N/A (not applicable) option or an N/R (not recorded) option. The audit does not have to be completed all at once, it is possible to leave the audit tool and return to it later as it is automatically saved as you progress through it. However, once you have clicked 'submit my answers' followed by 'next', the audit will be submitted, and no further changes will be possible.
If you are having difficulty while completing the survey, please contact Dr Maria Healy maria.healy@qub.ac.uk stating your telephone contact details and she will get back to you as soon as possible.

Thank you for completing this audit tool.

Q1 MLU Name **and** Identifier Number (anonymised by lead data collector relating to each case note)

_____

Q2 Gestation at Birth

_____

Q3 Parity

_____

Q4 Ethnic origin

- ○ White (1)
- ○ Black (2)
- ○ Asian (3)
- ○ Indian (4)
- ○ Pakistani (5)
- ○ Bangladeshi (6)
- ○ Irish Traveller (7)
- ○ Mixed (8)
- ○ Other (9)

Audit Criterion 1 - **The majority of women admitted to a Midwife-Led Unit should meet the RQIA (2016) criteria for admission to a MLU in Northern Ireland OR an individualised care plan should have been developed**

Q5 In the Maternity Hand Held Record (MHHR), the woman met the criteria for admission to MLU as per the RQIA guideline.

- ○ Yes (1)
- ○ No (2)
- ○ N/R (3)

Skip To: Q8 If In the Maternity Hand Held Record (MHHR), the woman met the criteria for admission to MLU as per... = Yes

Q6 If the woman did not meet the criteria, was an individualised care plan developed?

- ○ Yes (1)
- ○ No (2)
- ○ N/A (3)

Q7
Reason for an individualised care plan:

- ☐ Less than 16 years old (1)
- ☐ More than 40 years old (2)
- ☐ BMI at booking > 40kg/m2 (3)
- ☐ Last recorded HB (4)
- ☐ More than 5 previous births (5)
- ☐ IVF pregnancy in addition to criteria stated on guideline (6)
- ☐ Previous blood transfusion or surgical intervention following PPH (7)
- ☐ Active labour following ARM (8)
- ☐ VBAC (9)
- ☐ Other, please provide further details (10) _____

Q8 Please provide further details on Audit Criterion, 1 if appropriate

_____

_____

Audit Criterion 2 - **All women's individual birth preferences and care during each stage of the pathway should be documented in their Maternity Hand Held Record (MHHR)**

Q9 The GAIN (RQIA) documentation was inserted into the MHHR, if not printed in the MHHR chart

- ○ Yes (1)
- ○ No (2)

Q10 Documented that labour/birth preferences recorded in the body of the MHHR or on the guideline documentation

- ○ Yes (1)
- ○ No (2)
- ○ N/R (3)

Q11 Please provide further details on Audit Criterion 2, if appropriate

_____

Audit Criterion 3 – The majority of women are assessed to be in active labour on admission to the MLU, commenced on and follow the Normal Labour and Birth Care Pathway

Q12 Initial labour assessment documentation:
(check antenatal section if documentation not inserted in MHHR)

▼ Partially completed (1) ... Fully completed (2)

Q13 Evidenced that pathway was commenced

- ○ Yes (1)
- ○ No (2)

Q14 The same midwifery team cared for the woman, (check signature pages on MHHR):

- ☐ Antenatally & intrapartum (1)
- ☐ Intrapartum only (3)
- ☐ Antenatally & postnatally (community) (4)
- ☐ Antenatally, intrapartum & postnatally (community) (5)
- ☐ Intrapartum and postnatally until discharge home from hospital (6)

Q15 Mobilisation during labour, include as many as apply:

- ☐ Changing labour positions (1)
- ☐ Birthing ball (2)
- ☐ Peanut ball (3)
- ☐ The Cub (4)
- ☐ Birthing mats (5)
- ☐ Combitrack (6)
- ☐ Bean bag (7)
- ☐ Birthing stool (8)
- ☐ Squatting on or over the bed (9)
- ☐ Birthing pool (10)
- ☐ Not recorded (11)
- ☐ Other (12) _____

Q16 Coping mechanisms for uterine activity

- ☐ Controlled breathing (1)
- ☐ TENS (2)
- ☐ Entonox (3)
- ☐ Diamorphine (4)
- ☐ Immersion in water during labour (5)
- ☐ Subcutaneous water for injection (6)
- ☐ Aromatherapy (9)
- ☐ Environmental lights dimmed, music (12)
- ☐ Hypnobirthing (13)
- ☐ Not recorded (15)
- ☐ Herbal remedies (including Rescue Remedy) (20)
- ☐ Reflexology (16)
- ☐ Acupressure (17)
- ☐ Moxibustion (18)
- ☐ Visualisation (19)
- ☐ Vocalisation (21)
- ☐ Other (14) _____

Q17 Doula present

- ○ Yes (1)
- ○ No (2)

Q18 In second stage of labour how was progress determined?
Tick all that apply

- ☐ Woman's behaviour (1)
- ☐ Signs of second stage (2)
- ☐ Expulsive contractions (9)
- ☐ Urge to push (11)

Q19 Full dilatation of cervix confirmed by vaginal examination

- Yes (1)
- No (2)

Q20 Total number of vaginal examination(s) prior to admission to MLU (including latent phase and membrane sweeps)

- 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- Other (6) _____

Q21 Total number of vaginal examinations during active labour (first and second stage)

- 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- Other (8) _____

Q22 Frequency of vaginal examination as per pathway

- Yes (1)
- No (2)
- VE not required (4)

Q23 Was ARM undertaken in line with the pathway?

- Yes (1)
- No (2)
- ARM not required (3)

Q24 Plan of intrapartum care discussed with appropriate colleague

- Yes (1)
- No (2)
- Not required (3)

Q25 Total duration of established labour and birth in hours & minutes (as noted on NIMATS)

	Hours	Minutes
Total duration of established labour and birth (1)		

Q26 Please provide further details on Audit Criterion 3, if appropriate

_____

_____

Audit Criterion 4 - **What were the maternal outcome indicators related to giving birth in the MLU for the individual woman?**

Q27 Mode of birth

- ○ Cephalic vaginal birth (1)
- ○ Cephalic vaginal waterbirth (2)
- ○ Breech vaginal birth (3)
- ○ Breech vaginal waterbirth (4)

Q28 Perineal trauma

- ☐ Intact (1)
- ☐ Grazes (2)
- ☐ Vaginal laceration (11)
- ☐ Labial (3)
- ☐ Peri-urethral (4)
- ☐ Clitoral (5)
- ☐ 1st degree tear (6)
- ☐ 2nd degree tear (7)
- ☐ Episiotomy (8)
- ☐ 3rd degree tear (9)
- ☐ 4th degree tear (10)

Q29 Perineal suturing

- ○ Not required (1)
- ○ Performed (2)
- ○ Required but not initially identified (3)
- ○ Woman declined (4)

Q30 Skin to skin

▼ < 15 minutes (1) ... Not recorded (5)

Q31 Breastfeeding initiated at birth

- Yes (1)
- No (2)
- N/R (3)

32 Breastfeeding on discharge home

- Yes (1)
- No (2)
- N/A (3)

Q33 Responsive infant feeding by woman (including formula feeding)

- Yes (1)
- No (2)
- N/A (3)

Q34 IV cannulation with no indication

- Yes (1)
- No (2)
- N/A (3)

Q35 Urinary catheterisation during labour

- Intermittent (1)
- Indwelling (2)
- Not required (3)

Q36 Management of 3rd stage of labour

- ○ Physiological (1)
- ○ Active management (2)
- ○ Physiological followed by active management (3)

Q37 Significant postnatal blood loss

- ○ > 500mls not requiring intervention (1)
- ○ >500mls requiring midwifery intervention (2)
- ○ > 500mls requiring medical intervention (3)
- ○ N/A (6)

Q38 Obstetric emergency

- ☐ Umbilical cord presentation (1)
- ☐ Umbilical cord prolapse (2)
- ☐ Fetal malpresentation (3)
- ☐ Fetal malposition (4)
- ☐ Shoulder dystocia (5)
- ☐ Sepsis (6)
- ☐ Anaphylaxis (7)
- ☐ APH (14)
- ☐ PPH (8)
- ☐ Eclamptic seizure (9)
- ☐ Retained placenta (active bleeding) (10)
- ☐ Maternal collapse (11)
- ☐ Maternal death (12)
- ☐ Other (13) _____
- ☐ N/A (15)

Q39 Significant other stayed with woman postnatally in MLU

- ○ Yes - partial duration of woman's stay (1)
- ○ Yes - full duration of woman's stay (2)
- ○ No - woman's preference (3)
- ○ No - significant other's preference (4)
- ○ No - not possible in MLU (5)
- ○ Other (6) _____

Q40
Number of different caregivers during labour and birth
(across breaks / shift changes; including medical / midwifery students) See signature pages on MHHR

_____

_____

_____

Q41 Please provide further details on Audit Criterion 4, if appropriate

_____

_____

Audit Criterion 5 - **What were the neonatal outcome indicators related to being birthed in the MLU for the baby?**

Q42 Birth

▼ Live birth (1) ... Neonatal Death (3)

Skip To: End of Block If Birth = Stillbirth

Q43 Birth weight

▼ (1) ... >5000g (6)

Q44 Birth Centile (please state)

Expected centile	
Actual centile	

Q45 Skin to skin with significant other (other than the mother)

- Yes (1)
- No (2)
- N/R (3)

Q46 Additional baby care required

- None (1)
- Admission to SCBU (2)
- Admission to NICU (3)
- Admitted to postnatal ward for further baby care observations (4)
- Admitted to postnatal ward for further baby care interventions (phototherapy, IV antibiotics) (5)
- Other (6) _____

Q47 Optimal cord clamping ("Wait for White" following physiological 3rd stage of labour)

- Yes (1)
- No (2)
- N/R (3)

Skip To: Q49 If Optimal cord clamping ("Wait for White" following physiological 3rd stage of labour) = Yes

Q48 Delayed cord clamping following active management of 3rd stage of labour

▼ At < 1 minute (2) ... N/A (1)

Q49 Was neonatal resuscitation required?

- ☐ No (1)
- ☐ Stimulation (2)
- ☐ Inflation breaths (3)
- ☐ Ventilation breaths (4)
- ☐ Cardiac compressions (5)
- ☐ Intubation (6)
- ☐ Umbilical catheterisation (7)
- ☐ Medication (8)

Skip To: Q51 If Was neonatal resuscitation required? = No

Q50 If resuscitation was required, was umbilical cord intact during resuscitation (for example inflation breaths)?

- ○ Yes (1)
- ○ No (2)
- ○ N/R (3)

Q51 APGAR at 5 minutes

_____

Q52 Were umbilical cord pHs:

- ○ Not required? (1)
- ○ Required, but not performed? (2)
- ○ Performed, but not required (4)
- ○ Performed - Insert PH results in Q55, if available (6)
- ○ Impossible to perform (e.g. blood gas analyser unavailable)? (5)

Q53 Significant infant birth trauma noted (written in notes or marked on Body Map) If yes, please give details

- ○ No (2)
- ○ Yes (1) _____

Q54
Undiagnosed fetal abnormality
If yes, please give details

- ○ No (2)
- ○ Yes (1) _____

Q55 Please provide further details on Audit Criterion 5, if appropriate

_____

_____

_____

Audit Criterion 6 - **All women who require transfer to another MLU or Obstetric Unit are transferred and rationale provided**

Q56 Was the woman transferred (e.g. to antenatal ward, another MLU or obstetric unit)?

	Yes	No
Transferred (1)	○	○

Skip To: End of Block If Was the woman transferred (e.g. to antenatal ward, another MLU or obstetric unit)? = Transferred [No]

Q57
Rationale for transfer documented

- ○ Regional In Utero Transfer Pro forma (1)
- ○ HART tool (2)
- ○ SBAR (3)
- ○ Not documented (4)
- ○ Other (5) _____

Q58 Woman transferred during:

▼ Latent stage (5) ... Postnatally (4)

Q59 Rationale for transfer of woman

- ☐ Not in labour (1)
- ☐ Analgesia (2)
- ☐ Delay in labour progress (1st stage) (3)
- ☐ Delay in labour progress (2nd stage) (4)
- ☐ Significant Meconium (6)
- ☐ Undiagnosed breech (7)
- ☐ PROM (8)
- ☐ Sepsis (9)
- ☐ APH (24)
- ☐ PPH (10)
- ☐ Maternal collapse (11)
- ☐ Manual removal of placenta (MROP) (12)
- ☐ Pre-eclampsia / eclampsia (13)
- ☐ Cord prolapse (14)
- ☐ Shoulder dystocia (15)
- ☐ Abnormal fetal heart rate (16)
- ☐ Maternal choice (17)
- ☐ Perineal repair in theatre (18)
- ☐ Staffing in MLU (19)
- ☐ Capacity in MLU (20)
- ☐ Continued observation of baby (21)
- ☐ Suspected neonatal abnormality (22)
- ☐ Other maternal or neonatal reasons for transfer, give details below (23)

_____

Q60 Transfer urgency

- ○ Non-life threatening (1)
- ○ Life threatening (2)
- ○ Transfer from Alongside MLU to Obstetric Unit (3)

Skip To: Q63 If Transfer urgency = Transfer from Alongside MLU to Obstetric Unit

Q61 Transfer duration time (from ambulance called to arrival at Obstetric Unit)

	Hours (1)	Minutes (2)
Time (4)		

Q62 Length of time from arrival at Obstetric Unit to handover of care

	Hours	Minutes
Time (4)		

Q63 Please provide further details on Audit Criterion 6, if appropriate

_____

_____

You have now answered all the questions. Please click 'submit my answers' followed by 'next', only when you are sure that you don't want to make any changes, to upload your answers and move to the exit screen, thank you

- ○ Submit my answers (1)

Skip To: End of Survey If You have now answered all the questions. Please click 'submit my answers' followed by 'next', on... = Submit my answers

Appendix 3: Audit Tool: Case Audit of the Northern Ireland Normal Labour and Birth Care Pathway within an obstetric labour ward

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Start of Block: Default Question Block

Audit of Normal Labour and Birth Care Pathway within an obstetric labour ward - The audit criteria and their associated evidence/actions contained in this audit tool are based on the following: the Regulation Quality Improvement Authority (RQIA, 2016) Guideline for Admission to Midwife-Led Units in Northern Ireland and the Northern Ireland Normal Labour and Birth Care Pathway; National Institute for Health and Care Excellence Intrapartum Care for Healthy Women and Babies (NICE 2014, 2017); and the Maternity Strategy for Northern Ireland 2012 (DOH, 2012). The criteria are also informed by best international practice evidence in relation to admission to Midwife-Led Units and Pathway of Care for Normal Labour and Birth; including the FIGO (2015) guidelines for Mother baby friendly birthing facilities (https://www.whiteribbonalliance.org/wp-content/uploads/2017/11/MBFBF-guidelines.pdf).

This audit tool is designed for use in the Case Audit of the Northern Ireland Normal Labour and Birth Care Pathway. The project audit team includes: Dr Maria Healy QUB, Dr Patricia Gillen SHSCT & UU, & Dr Julie McCullough UU in collaboration with maternity service users and colleagues.

The audit data is being collected from randomly selected case notes of women who gave birth from 1st January to 31st December 2018.

This audit tool should be completed by an authorised person only! You are able to access this data collection tool as you are one of the data collectors in the NHSCT. There are 4 criteria being assessed in this audit called Criterion 1-4. Each criterion is stated and then followed by a number of questions. At various stages, throughout the audit there are some additional text spaces where you can include further information, if needed. Please complete all of the questions in as much detail as possible; some questions have an N/A (not applicable) option or an N/R (not recorded) option. The audit does not have to be completed all at once, it is possible to leave the audit tool and return to it later as it is automatically saved as you progress through it. However, once you have clicked 'submit my answers' followed by 'next', the audit will be submitted, and no further changes will be possible. If you are having difficulty while completing the survey, please contact Dr Maria Healy maria.healy@qub.ac.uk stating your telephone contact details and she will get back to you as soon as possible.

Thank you for completing this audit tool.

Q1 Insert the Obstetric Unit Name (e.g. Causeway or Antrim) **and** Identifier Number (anonymised by lead data collector relating to each case note)

_____

Q2 Gestation at Birth

Q3 Parity

Q4 Ethnic origin of women

- White (1)
- Black (2)
- Asian (3)
- Indian (4)
- Pakistani (5)
- Bangladeshi (6)
- Irish Traveller (7)
- Mixed (8)
- Other (9)

End of Block: Default Question Block

Start of Block: Block 3

Audit Criterion 1 - The majority of women with a straightforward pregnancy are assessed to be in active labour on admission to the obstetric labour ward, commenced on and follow the Normal Labour and Birth Care Pathway

Q5 Initial labour assessment documentation:
(check antenatal section if documentation not inserted in MHHR)

▼ Partially completed (1) ... Fully completed (2)

Q6 Documented that pathway was commenced

- Yes (1)
- No (2)

Q7 Documented that midwife cared for woman both antenatally and during labour
Yes (1)

- No (2)
- N/R (3)

Q8

Was the following offered/facilitated?

	Yes (1)	No (2)	Not recorded (NR) (4)	Not required (5)
Was more than one birth partner offered and facilitated (1)	☐	☐	☐	☐
Was overnight stay facilitated for significant other (2)	☐	☐	☐	☐
Was light diet offered during labour (3)	☐	☐	☐	☐
Was hydration offered, including isotonic drinks during labour (6)	☐	☐	☐	☐

Q9 Mobilisation during labour, include as many as apply:

- ☐ Changing labour positions (1)
- ☐ Birthing ball (2)
- ☐ Peanut ball (3)
- ☐ The Cub (4)
- ☐ Birthing mats (5)
- ☐ Combitrack (6)
- ☐ Bean bag (7)
- ☐ Birthing stool (8)
- ☐ Squatting on or over the bed (9)
- ☐ Birthing pool (10)
- ☐ Not recorded (11)
- ☐ Other (12) _____

Q10 Coping mechanisms for uterine activity

- ☐ Controlled breathing (1)
- ☐ TENS (2)
- ☐ Entonox (3)
- ☐ Diamorphine (4)
- ☐ Immersion in water during labour (5)
- ☐ Subcutaneous water for injection (6)
- ☐ Aromatherapy (9)
- ☐ Environmental lights dimmed, music (12)
- ☐ Hypnobirthing (13)
- ☐ Not recorded (15)
- ☐ Herbal remedies (including Rescue Remedy) (20)
- ☐ Reflexology (16)
- ☐ Acupressure (17)
- ☐ Moxibustion (18)
- ☐ Visualisation (19)
- ☐ Vocalisation (21)
- ☐ Other (14) _____

Q11 Doula present

- ○ Yes (1)
- ○ No (2)

Q12 In second stage of labour, how was progress determined?
Tick all that apply

- ☐ Woman's behaviour (1)
- ☐ Signs of second stage (2)
- ☐ Expulsive contractions (9)
- ☐ Urge to push (11)

Q13 Full dilatation of cervix confirmed by vaginal examination

- Yes (1)
- No (2)

Q14 Total number of vaginal examination(s) prior to admission to obstetric labour ward (including latent phase and membrane sweeps)

- 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- Other (6) _____

Q15 Total number of vaginal examinations during active labour (first and second stage)

- 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- Other (8) _____

Q16 Frequency of vaginal examination as per pathway

- Yes (1)
- No (2)
- VE not required (4)

Q17 Was ARM undertaken in line with the pathway?

- Yes (1)
- No (2)
- ARM not required (3)

Q18 Plan of intrapartum care discussed with appropriate colleague

- Yes (1)
- No (2)
- Not required (3)

Q19 Total duration of established labour and birth in hours & minutes (as noted on NIMATS)

	Hours	Minutes
Total duration of established labour and birth (1)		

Q20 Please provide further details on Audit Criterion 1, if appropriate

_____

_____

Audit Criterion 2 - **What were the maternal outcome indicators related to giving birth in an obstetric labour ward for the individual woman?**

Q21 Mode of birth

- ○ Cephalic vaginal birth (1)
- ○ Cephalic vaginal waterbirth (2)
- ○ Breech vaginal birth (3)
- ○ Breech vaginal waterbirth (4)

Q22 Perineal trauma

- ☐ Intact (1)
- ☐ Grazes (2)
- ☐ Vaginal laceration (11)
- ☐ Labial (3)
- ☐ Peri-urethral (4)
- ☐ Clitoral (5)
- ☐ 1st degree tear (6)
- ☐ 2nd degree tear (7)
- ☐ Episiotomy (8)
- ☐ 3rd degree tear (9)
- ☐ 4th degree tear (10)

Q23 Perineal suturing

- ○ Not required (1)
- ○ Performed (2)
- ○ Required but not initially identified (3)
- ○ Woman declined (4)

Q24 Skin to skin

▼ < 15 minutes (1) ... Not recorded (5)

Q25 Breastfeeding initiated at birth

- Yes (1)
- No (2)
- N/R (3)

Q26 Breastfeeding on discharge home

- Yes (1)
- No (2)
- N/A (3)

Q27 Responsive infant feeding by woman (including formula feeding)

- Yes (1)
- No (2)
- N/A (3)

Q28 IV cannulation with no indication

- Yes (1)
- No (2)
- N/A (3)

Q29 Urinary catheterisation during labour

- Intermittent (1)
- Indwelling (2)
- Not required (3)

Q30 Management of 3rd stage of labour

- ○ Physiological (1)
- ○ Active management (2)
- ○ Physiological followed by active management (3)

Q31 Significant postnatal blood loss

- ○ > 500mls not requiring intervention (1)
- ○ >500mls requiring midwifery intervention (2)
- ○ > 500mls requiring medical intervention (3)
- ○ N/A (6)

Q32 Obstetric emergency

- ☐ Umbilical cord presentation (1)
- ☐ Umbilical cord prolapse (2)
- ☐ Fetal malpresentation (3)
- ☐ Fetal malposition (4)
- ☐ Shoulder dystocia (5)
- ☐ Sepsis (6)
- ☐ Anaphylaxis (7)
- ☐ APH (14)
- ☐ PPH (8)
- ☐ Eclamptic seizure (9)
- ☐ Retained placenta (active bleeding) (10)
- ☐ Maternal collapse (11)
- ☐ Maternal death (12)
- ☐ Other (13) _____
- ☐ N/A (15)

Q33 Significant other stayed with woman postnatally in the maternity unit

- ○ Yes - partial duration of woman's stay (1)
- ○ Yes - full duration of woman's stay (2)
- ○ No - woman's preference (3)
- ○ No - significant other's preference (4)
- ○ No - not possible in maternity unit (5)
- ○ Other (6) _____

Q34
Number of different caregivers during labour and birth
(across breaks / shift changes; including medical / midwifery students) See signature page on MHHR

_____

_____

Q35 Please provide further details on Audit Criterion 2, if appropriate

_____

_____

Audit Criterion 3 - **What were the neonatal outcome indicators related to being birthed in the obstetric labour ward for the baby?**

Q36 Birth

▼ Live birth (1) ... Neonatal Death (3)

Skip To: End of Block If Birth = Stillbirth

Q37 Birth weight

▼ (1) ... >5000g (6)

Q38 Birth Centile (please state)

Expected centile (3)	
Actual centile (7)	

Q39 Skin to skin with significant other (other than the mother)

- ○ Yes (1)
- ○ No (2)
- ○ N/R (3)

Q40 Additional baby care required

- ○ None (1)
- ○ Admission to SCBU (2)
- ○ Admission to NICU (3)
- ○ Admitted to postnatal ward for further baby care observations (4)
- ○ Admitted to postnatal ward for further baby care interventions (phototherapy, IV antibiotics) (5)
- ○ Other (6) _____

Q41 Optimal cord clamping ("Wait for White" following physiological 3rd stage of labour)

- ○ Yes (1)
- ○ No (2)
- ○ N/R (3)

Skip To: Q43 If Optimal cord clamping ("Wait for White" following physiological 3rd stage of labour) = Yes

---

Q42 Delayed cord clamping following active management of 3rd stage of labour

▼ At < 1 minute (2) ... N/A (1)

Q43 Was neonatal resuscitation required?

- ☐ No (1)
- ☐ Stimulation (2)
- ☐ Inflation breaths (3)
- ☐ Ventilation breaths (4)
- ☐ Cardiac compressions (5)
- ☐ Intubation (6)
- ☐ Umbilical catheterisation (7)
- ☐ Medication (8)

Skip To: Q45 If Was neonatal resuscitation required? = No

Q44 If resuscitation was required, was umbilical cord intact during resuscitation (for example inhalation breaths)?

- ○ Yes (1)
- ○ No (2)
- ○ N/R (3)

Q45 APGAR at 5 minutes

_____

Q46 Were umbilical cord pHs:

▼ Not required? (1) ... Impossible to perform (e.g. blood gas analyser unavailable)? (5)

Q47 Significant infant birth trauma noted (written in notes or marked on Body Map) If yes, please give details

- ○ No (2)
- ○ Yes (1) _____

Q48
Undiagnosed fetal abnormality
If yes, please give details

- ○ No (2)
- ○ Yes (1) _____

Q49 Please provide further details on Audit Criterion 3, if appropriate

_____

_____

Audit Criterion 4 - **All women who require transfer to another Obstetric Unit or ICU are transferred and rationale provided**

Q50 Was the women transferred to another obstetric unit or ICU?

	Yes (1)	No (2)
Was the woman transferred? (1)	○	○

Skip To: End of Block If Was the women transferred to another obstetric unit or ICU? = Was the woman transferred? [No]

Q51
Rationale for transfer documented

- ○ Regional In Utero Transfer Pro forma (1)
- ○ HART tool (2)
- ○ SBAR (3)
- ○ Not documented (4)
- ○ Other (5) _____
- ○

Q52 Woman transferred during:

▼ Latent stage (5) ... Postnatally (4)

Q53 Rationale for transfer of woman

- ☐ Not in labour (1)
- ☐ Analgesia (2)
- ☐ Delay in labour progress (1st stage) (3)
- ☐ Delay in labour progress (2nd stage) (4)
- ☐ Significant Meconium (6)
- ☐ Undiagnosed breech (7)
- ☐ PROM (8)
- ☐ Sepsis (9)
- ☐ APH (24)
- ☐ PPH (10)
- ☐ Maternal collapse (11)
- ☐ Manual removal of placenta (MROP) (12)
- ☐ Pre-eclampsia / eclampsia (13)
- ☐ Cord prolapse (14)
- ☐ Shoulder dystocia (15)
- ☐ Abnormal fetal heart rate (16)
- ☐ Maternal choice (17)
- ☐ Perineal repair in theatre (18)
- ☐ Staffing in MLU (19)
- ☐ Capacity in MLU (20)
- ☐ Continued observation of baby (21)
- ☐ Suspected neonatal abnormality (22)
- ☐ Other maternal or neonatal reasons for transfer, give details below (23)

_____

Q54 Transfer urgency

▼ Non-life threatening (1) ... Life threatening (2)

Q55 Transfer duration time (from ambulance called to arrival at other Obstetric Unit/ICU)

	Hours	Minutes
Time (4)		

Q56 Length of time from arrival at other Obstetric Unit/ICU to handover of care

	Hours	Minutes
Time (4)		

Q57 Please provide further details on Audit Criterion 4, if appropriate

_____

_____

You have now answered all the questions. Please click 'submit my answers' followed by 'next', only when you are sure that you don't want to make any changes, to upload your answers and move to the exit screen, thank you

- ○ Submit my answers

Skip To: End of Survey If You have now answered all the questions. Please click 'submit my answers' followed by 'next'.

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