

INTRODUCTION

- Postpartum haemorrhage (PPH) is the leading cause of maternal death worldwide, especially in low- and middle-income countries. In Vietnam, despite declining maternal mortality, PPH remains a major challenge.
- This study used time-and-motion methods to examine how obstetric teams manage PPH in a busy maternity hospital, aiming to identify workflow bottlenecks and improve care efficiency.

METHODS

- This observational time-and-motion study was conducted at Tu Du Hospital (Vietnam) from September to December 2024. Fourteen women with ≥ 1000 mL postpartum blood loss following vaginal delivery were enrolled after providing postnatal consent. Clinical activities were recorded via routine CCTV and categorised into five domains: assessment, pharmacological treatment, blood transfusion, non-pharmacological interventions, and administrative tasks.
- Two trained reviewers independently analysed anonymised video footage and clinical records using a structured coding framework. Concurrent tasks were logged in parallel. Descriptive statistics were used to summarise activity duration and compare interventions by PPH cause. The study was approved by Tu Du Hospital and the University of Liverpool.

RESULTS

Medical team characteristics

Medical team	N = 98 staff
Midwives	43
Obstetricians	35
Anaesthetist	2
Medical Sonographer	2
Other (Trainee)	16



Characteristics of observed women with PPH

PPH WOMEN	n = 14
Age (years)	Median = 35.5 SD = 5.86
Gestational age (completed weeks)	Median = 39 SD = 3.79
Nulliparous	6 (42.9%)
Singleton	12 (85.7%)
Previous PPH	1 (7.1%)
Previous blood transfusion due to PPH	1 (7.1%)
Previous CS	1 (7.1%)
Labour induction (Foley balloon)	(28.6%)
Augmentation	2 (14.3%)
Epidural analgesia	4 (28.6%)
Precipitous labour	3 (21.4%)
Duration of 2nd stage (mins)	Median = 28 SD = 18.5
Instrumental delivery	2 (14.3%)
Duration of 3rd stage (mins)	Median = 5.5 SD = 2.29
Manual removal of the placenta	1 (7.1%)
Blood loss at initial intervention (mL)	Median = 725 SD = 262.62 Min = 350 Max = 1300
PPH cause	Tone 10 (71.4%) Trauma 2 (14.3%) Mix (14.3%) <i>Tone + Trauma</i> <i>Trauma + ITP</i>
Balloon tamponade intervention	8 (57.1%)
Blood loss at the end of treatment	Median = 1235 SD = 305.93 Min = 1050 Max = 2040
Status of woman when transferred	Return to postnatal ward 11 (78.5%) Transferred to high-level care 3 (21.5%)



Scan here
for description of
treatment activities

Activity Domains and Time Distribution

- **Blood Transfusion:** This was the most time-consuming task (median 195 min), with delays in preparation and delivery contributing to prolonged management.
- **Balloon Tamponade:** Used in 57% of cases, inserted a median of 15 minutes after bleeding onset; the procedure took around 6 minutes. All were applied before surgical escalation.
- **Suturing:** Performed in all cases (median 28 min), with longer durations in trauma-related PPH.
- **Medications:** Uterotonics were given early, often within 10 minutes. Additional agents (e.g. tranexamic acid, ergometrine) extended treatment time in some cases.
- **Documentation:** Administrative tasks averaged 43 minutes, often done alongside clinical care, adding to staff workload.

DISCUSSION

- **Key Insights:** This is the first T&M study of PPH management in a real-world, low-resource setting using CCTV footage and clinical data. The study provides detailed, real-time data on how obstetric teams allocate time across interventions during PPH events.
- **Clinical and Operational Findings:** Average care time per case exceeded 6 hours. Blood transfusion (median 195 mins) and documentation (average 43 mins) were the most time-consuming activities. Uterine atony was the most common cause of PPH; balloon tamponade was used in 57% of cases, with no surgical escalation required. All women survived; 93% returned to standard care, highlighting the effectiveness of early, coordinated interventions.
- **Comparative Reflections:** Structured training programmes like PROMPT and OBS Cymru show that rapid diagnosis and clear team roles improve outcomes. Our findings echo this: early tamponade and transfusion were linked to faster bleeding control.
- **Systemic Barriers:** Delays in transfusion reflect known logistical challenges in LMICs. High reliance on tamponade reflects proactive protocols; however, literature cautions about delayed escalation in some settings.
- **Documentation Load:** Time spent on non-clinical tasks may reduce availability for direct care. Similar patterns are seen in other specialities, where documentation often outweighs patient-facing time.
- **Limitations:** Small sample size due to labour-intensive video review and rarity of high-volume PPH. Single-site design limits generalisability.
- **Recommendations:** Reduce documentation burden via digital tools or delegated support. Scale time-and-motion analysis as a method to improve emergency response and system design in maternity care.

CONCLUSION

This study highlights the complexity of real-time PPH care and the critical role of early, coordinated interventions. Streamlining blood transfusion and reducing documentation burden may significantly improve workflow efficiency and patient outcomes in emergency obstetric settings.