POSTPARTUM HAEMORRHAGE TRENDS IN THE UK USING NOVEL PPH CLASSIFICATION

Thuan Phan, Steven Lane, Andrew Sharp, Andrew D. Weeks - Liverpool Women's Hospital & University of Liverpool, England, UK

Scan here for full-text request

INTRODUCTION

- Postpartum haemorrhage (PPH) is a major cause of maternal morbidity and mortality, with rising incidence and severity in high-income countries despite advances in obstetric care.
- Identifying specific obstetric subgroups at highest risk is essential for effective prevention and management.
- This study analyses 20-year PPH trends at a large UK maternity hospital using detailed classification-based approaches to address gaps in subgroup-specific evidence.

METHODS

- Design: Retrospective cohort, 2003–2022.
- Population: All singleton term births (n=144,256) at Liverpool Women's Hospital (LWH).
- PPH Classification: Robson 1 and 2 (1) and CS-based subgroups (2).
- Analysis: Logistic regression, aORs adjusted for age, ethnicity, and birth weight.
- Ethics: NHS & University of Liverpool approved.

Scan here for PPH classification

Scan here for population characteristics

Scan here for risk assessment

RESULTS

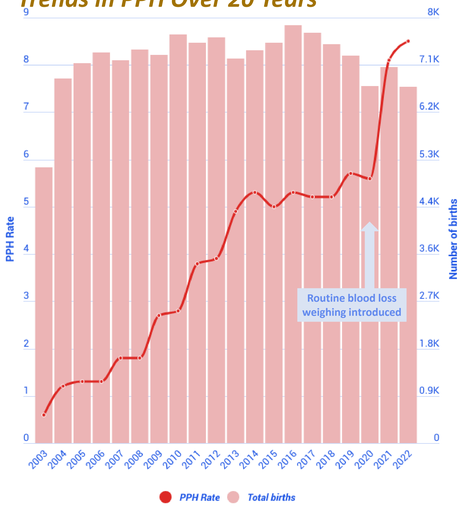
Study Population Characteristics

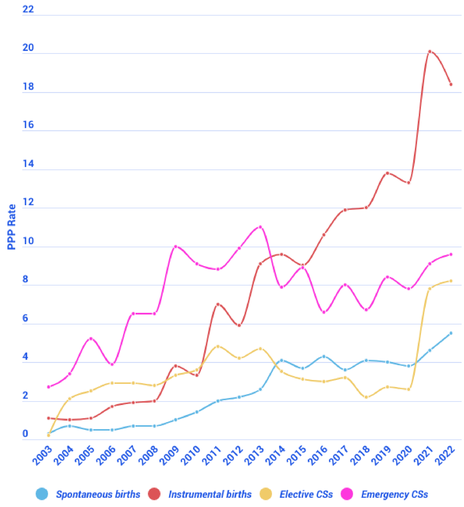
The study included 144,256 term births at LWH (2003–2022), with 5,826 cases (4.0%) of PPH; the mean maternal age was 29.1 years, and most women were White/White British (85.7%). Higher PPH rates were observed among African/African British women, mothers aged ≥40 years, and neonates with birth weight ≥4000g.

Risk factors for PPH

Among vaginal births (N=107,627), instrumental delivery and induced labour significantly increased the risk of both moderate and severe PPH compared to spontaneous delivery, with the highest risk seen in women requiring MRP (aOR for severe PPH: 26.02). For caesarean births (N=36,585), emergency CS was associated with a much higher risk of moderate (aOR: 2.17) and severe PPH (aOR: 3.04) compared to elective CS.

Trends in PPH Over 20 Years





PPH Trends by Obstetric Subgroups

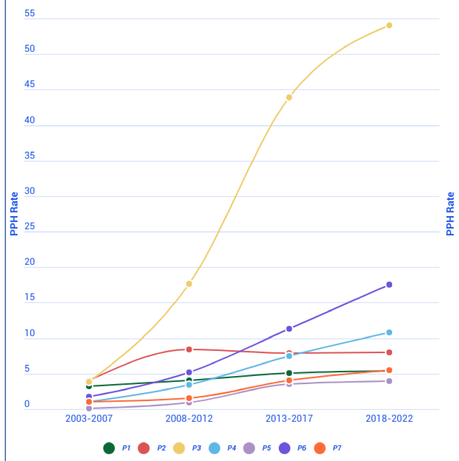
	Total women n (%)[1]	Total PPH >1000mL n (%)[2]	Severe PPH >2000mL		Overall change in % PPH rate[4]		
			n (%)	Relative contribution[3] (% of all RG1&2)	Total	Moderate 1001-2000mL	Severe >2000mL
RG1&2 subgroups – All are singleton, cephalic, first births at term							
P1 elCS	2017 (3.4)	98 (4.8)	5 (0.2)	0.17	**6.5**	6.10	0.40
P2 emCS	10595 (17.9)	758 (7.1)	67 (0.6)	2.29	**5.5**	4.90	0.60
P3 MRP	1115 (1.9)	293 (26.3)	69 (6.2)	2.35	**57.1**	37.10	20.00
P4 SpL-IB	8031 (13.6)	420 (5.2)	48 (0.6)	1.64	**14.3**	14.80	- 0.50
P5 SpL-NB	19748 (33.4)	347 (1.7)	27 (0.1)	0.92	**5.7**	5.30	0.40
P6 IOL-IB	6598 (11.2)	661 (10.1)	63 (1.0)	2.15	**18.7**	17.90	0.80
P7 IOL-NB	10821 (18.3)	350 (3.3)	41 (0.4)	1.39	**7.7**	6.80	0.90
Missing data	119 (0.2)	2 (1.7)	0 (0.0)	0.00			
TOTAL - N	**59044 (100)**	**2929 (4.9)**	**320 (0.5)**	**10.91**	**9.1**	**8.30**	**0.80**
CS birth subgroups – All are at term							
A elCS-PCS	13471 (36.8)	426 (3.2)	40 (0.3)	1.90	**6.6**	6.3	0.3
B elCS-NoPCS	4542 (12.4)	244 (5.4)	21 (0.5)	1.00	**8.9**	7.7	1.2
C emCS-PCS-IOL	1246 (3.4)	138 (11.1)	20 (1.6)	0.95	**12.3**	10.4	1.9
D emCS-PCS-SpL	2876 (7.9)	226 (7.9)	45 (1.6)	2.14	**5.9**	4.2	1.7
E emCS-NoPCS-IOL	7576 (20.7)	585 (7.8)	65 (0.9)	3.10	**8.5**	7.2	1.3
F emCS-NoPCS-SpL	6100 (16.7)	425 (7.0)	41 (0.7)	1.95	**4.6**	4.2	0.4
Missing data	774 (2.1)	56 (7.3)	4 (0.6)	0.19			
TOTAL - N	**36585 (100)**	**2100 (5.7)**	**236 (0.6)**	**11.23**	**7.4**	**6.5**	**0.9**

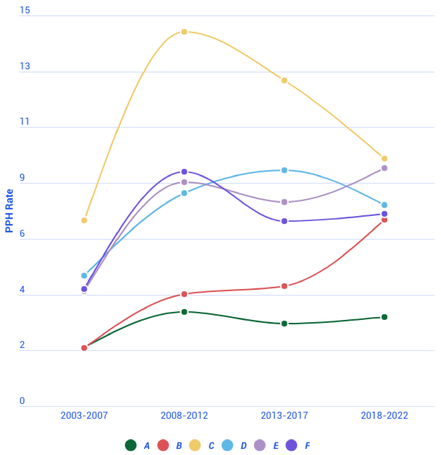
elCS = elective CS; emCS = emergency CS; PCS = with previous CS; NoPCS = without previous CS

MRP = Manual Removal of Placenta; SpL = Spontaneous labour; IOL = Induction of labour; NB = Normal birth; IB = Instrumental birth

[1] *Group size (%) = n of women in the group/total N women x 100;*
[2] *PPH group rate (%) = n of PPH in the group/n of women in the group x 100;*
[3] *Relative contribution (%) = n of PPH in the group/total N of PPH x 100;*
[4] *Overall change in PPH rate = PPH rate in 2022 – PPH rate in 2003.*

Trends in PPH Over 20 Years





DISCUSSION

- **PPH rates increased sharply** from 0.6% (2003) to 8.5% (2022), especially in high-intervention births such as MRP, induced instrumental deliveries, and emergency CS.
- **MRP had the highest PPH burden,** contributing over 25% of all severe cases despite comprising just 1.9% of births.
- **Combined interventions matter:** Induction followed by instrumental birth significantly increased PPH risk, suggesting compounded effects.
- **Routine blood loss weighing (post-2020)** improved detection but does not fully explain the observed rise, especially in severe PPH.
- **Clinical response must be targeted,** prioritising early risk identification, stronger prophylaxis, and informed decision-making for high-risk groups.

CONCLUSION

PPH rates have risen significantly over the past two decades, particularly in high-intervention births such as MRP and induced instrumental deliveries. Targeted prevention, early intervention, and informed decision-making are essential to reduce the growing burden of PPH.