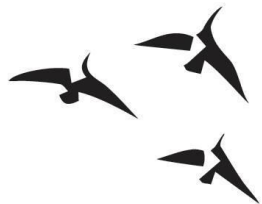# Factors affecting third-stage management and postpartum hemorrhage in planned midwife-led home and birth center births in the United States

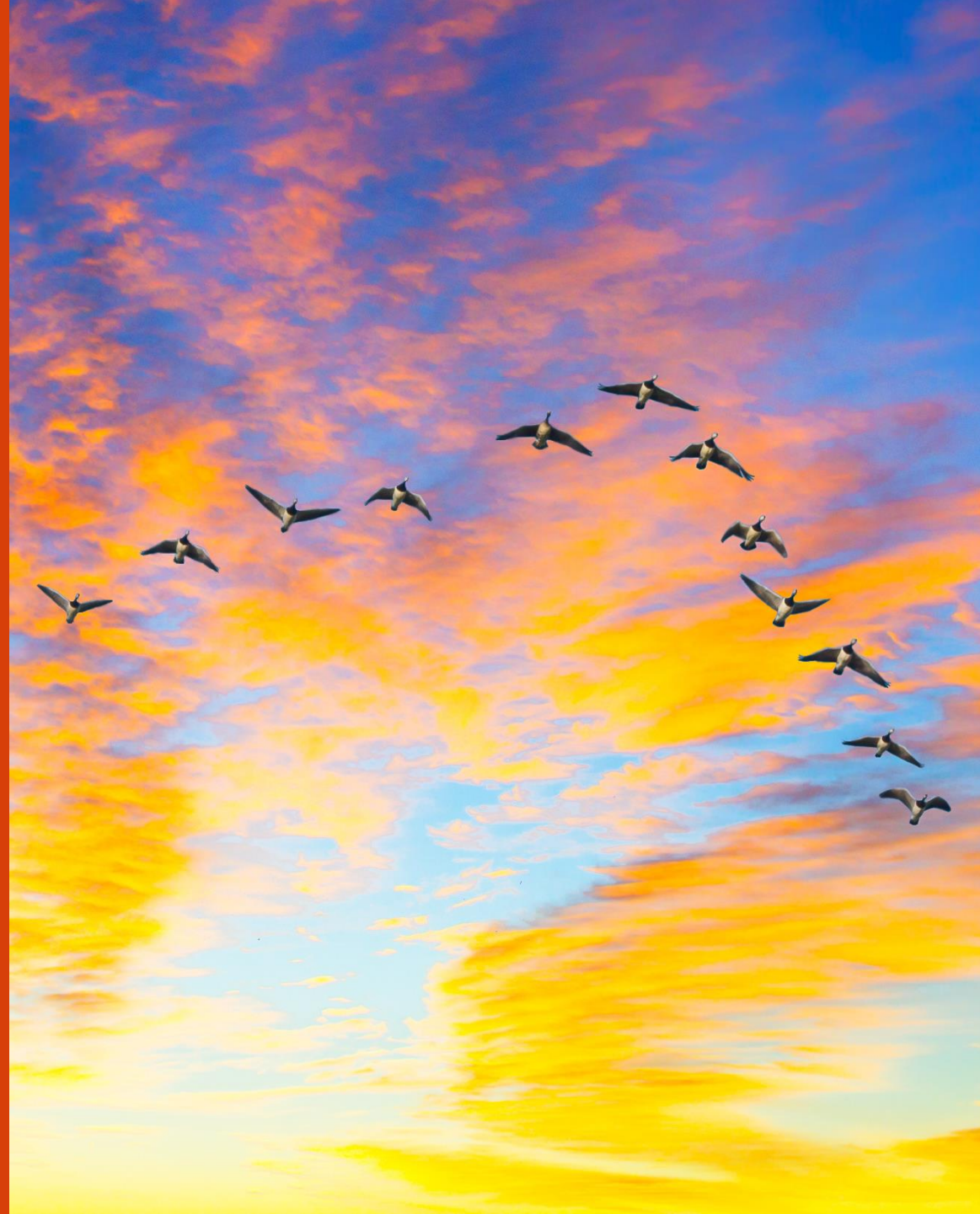Elise Erickson, PhD, CNM, FACNM

Marit Bovbjerg, PhD, MS

Melissa Cheyney, PhD, LDM

Uplift

A Research and Reproductive Equity Laboratory

ORIGINAL ARTICLE

Factors affecting third-stage management and postpartum hemorrhage in planned midwife-led home and birth center births in the United States

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Dismantling Racism in Midwifery
66TH ANNUAL MEETING & EXHIBITION
VIRTUAL MEETING · MAY 23 – 25, 2021
AMERICAN COLLEGE of NURSE-MIDWIVES

Background

- Increases in pregnant people seeking community birth in the US
- Lack of systems integration and safety questions
- PPH - first line complication that sometimes requires transfer
- Differential access to life-saving anti-hemorrhagics
- PPH a growing problem in the US, major contributor to maternal death globally
- Occurs more frequently when certain risk factors are present

- Little is known about how practitioners attending women in the community setting in the United States approach third-stage labor management, use of preventive strategies for PPH, treatment, and rates of hospital transfer for prolonged third-stage labor and/or PPH.

- In addition, the methods midwives use for third-stage management may be influenced by training, form of licensure, certification, and/or state-level regulations that either prohibit or support their practice, and access to and use of uterotonic medications.

Purpose

- Thus, the primary purpose of this study was to describe, in the context of planned community birth, the incidence of PPH, pregnancy and birth variables associated with PPH, and the actions taken by community midwives to prevent and treat blood loss, including the transfer of women to hospitals because of third-stage labor complications.

- Our secondary aim was to evaluate the impact of state-level regulation and the licensure/certification status of community midwives on the prevention/treatment of PPH and on PPH outcomes.

Community births: analytic sample 2004-2009

- 17,836 births MANA data (37 weeks +, vertex vaginal births)
- 90% white/10% birthing people of color
- 66.1% multiparous (1-4 prior births)
- Mean age 29.9 years (SD 5.3)
- 20% were > 35 years
- 66.8% w/ normal BMI at onset of pregnancy
- 9.8% history of prior PPH among multiparous women
- 6.7% history of prior Cesarean birth

Outcomes

- PPH 500mL
- PPH 1000mL
- Length of 3rd stage labor

Predictors

- Parity, age, race/ethnicity
- Gestational age
- BMI
- Prior CB, hx PPH
- Antepartum bleeding
- Pregnancy complications
- Onset/progression of labor
- Use of oxytocin in third stage / use of herbs
- State level regulatory status and midwifery licensure by year of data collection
  - Barrier States = barring midwifery/ carriage of medication or non-regulating midwifery
  - Licensure/Certification Status (CPM/LM/LDM, CNM/CM, Dual, No stated credential).

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Results

- Of the 17 836 vaginal births, 15.9% had blood loss of over 500 mL and 3.3% had 1000 mL or greater blood loss.

- Midwives used pharmaceuticals to prevent or treat postpartum bleeding in 6.3% and 13.9% of births, respectively.

- The rate of hospital transfer after birth was 1.4% (n = 247).

Results

- In adjusted analyses, PPH was less likely when
  - births occurred at home vs a birth center,
  - if the midwife had a CNM/CM credential vs a CPM/LM/LDM credential,
  - or if the person was multiparous without a history of PPH or prior cesarean birth.
  - PPH was more likely in states with barriers to midwifery practice compared with regulated states (OR: 1.26; 95% CI, 1.16-1.38).

Antepartum/Fetal Characteristics Associated with PPH 500/1000mL PPH

- Higher gestational age
- Primiparity
- Prior Cesarean
- History of first trimester bleeding
- Hypertension/Preeclampsia
- Fetal sex: female
- Macrosomia

Labor/Birth Characteristics Associated with 500/1000mL PPH

- Labor induction/augmentation methods

- >12 hours ROM

- > 18 hours latent labor

- >12 hours active phase

- >1 hour 2nd stage

- More severe or multiple lacerations

- >=60 min 3rd stage

- Manual removal of placenta

Third stage specific

- Use of oxytocin/methergine coded as "preventive action"

Variable	n(%)	PPH over 500mL	PPH 1000mL or higher
PPH prevention strategy/action			
None	14 852 (83.3)	1957 (13.2)***	456 (2.7)***
Oxytocin/methergine	1114 (6.3)	413 (37.5)***	130 (11.8)***
Herbal preparation	1296 (7.3)	368 (28.5)***	103 (7.9)***
Others	927 (5.2)	222 (24.0)***	60 (6.5)***

Community Birth Midwives Credentials/Licensure

	Total n (%)	CPM/LM/ LDM n (%)	CNM/CM or dually credentialed (CNM/CPM) n (%)	No known midwifery credential, n (%)
Bleeding treatment				
Oxytocin/methergine or other pharmaceuticals	2490 (13.9)	1904 (13.7)	419 (14.3)	167 (16.9)[*]
Herbal preparation	1049 (5.9)	915 (6.6)	46 (1.6)	88 (8.9)[***]
Intravenous fluids	384 (2.2)	294 (2.1)	73 (2.5)	17 (1.7)
Fundal massage	5527 (30.1)	4289 (30.8)	999 (34.0)	239 (24.2)[***]
Nipple stimulation	1995 (11.2)	1643 (11.8)	282 (9.6)	70 (7.1)[***]
Bimanual compression	414 (2.3)	346 (2.5)	56 (2.0)	12 (1.2)[*]
Manual removal of placenta	239 (1.3)	184 (1.3)	43 (1.5)	12 (1.2)
Transfer (PPH or placental delivery)	247 (1.4)	206 (1.5)	26 (0.9)	14 (1.5)[*]
Dilation and curettage	60 (0.3)	50 (0.4)	6 (0.2)	4 (0.4)
Blood transfusion	57 (0.3)	46 (0.33)	8 (0.3)	3 (0.3)
Postpartum anemia	193 (1.1)	151 (1.1)	26 (0.9)	16 (1.6)
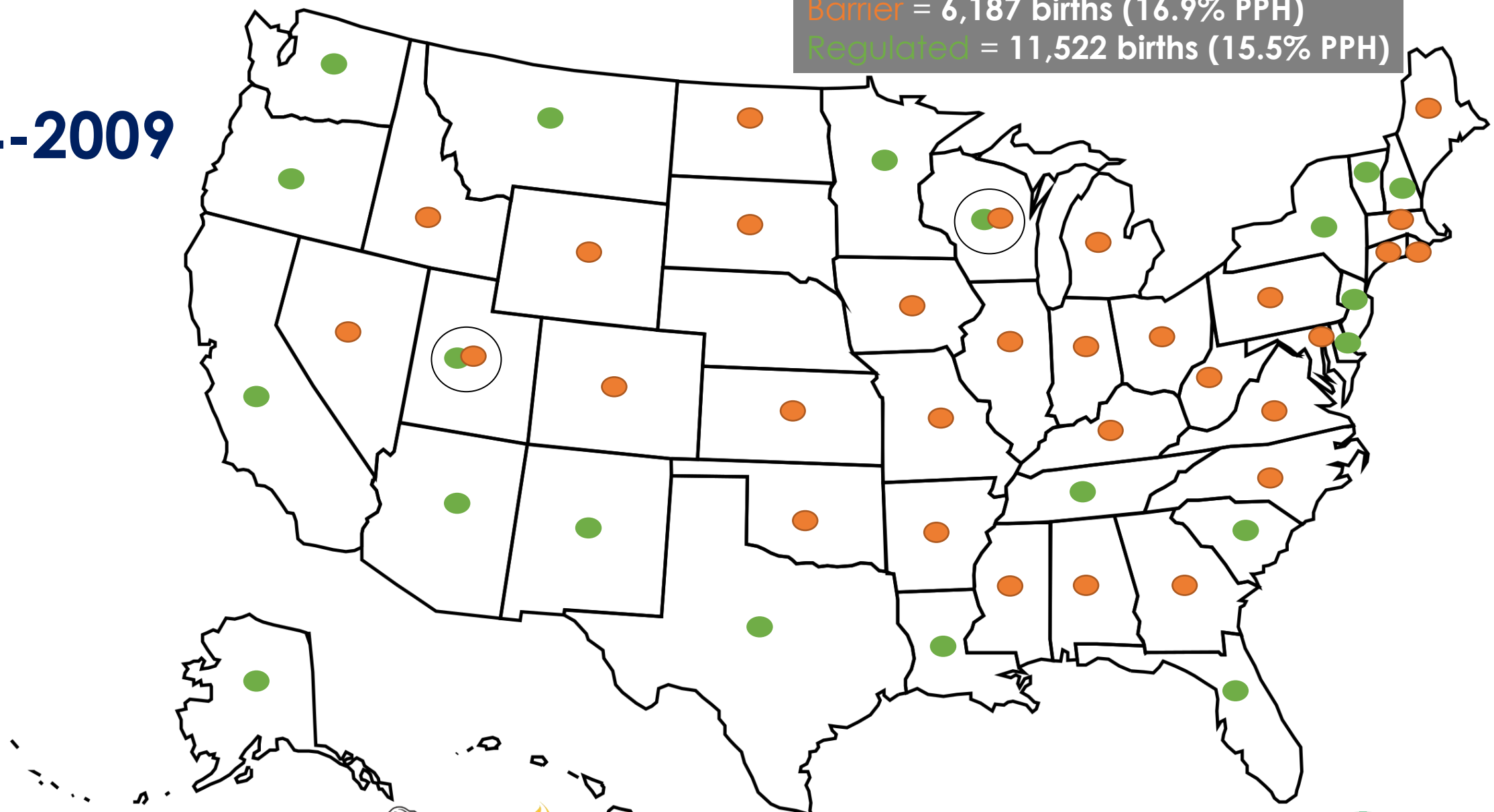
Factors Associated with Births Occurring in Barrier States vs. Regulated States

	Barrier state	Regulated state
	n = 6187 n (%)	n = 11 522 n (%)
Bleeding treatment		
Oxytocin/methergine or other pharmaceuticals	670 (10.8)	1791 (15.5)***
Herbal preparation	500 (8.1)	546 (4.7)***
Intravenous fluids	100 (1.6)	279 (2.4)***
Fundal massage	1647 (26.6)	3853 (33.4)***
Nipple stimulation	644 (10.4)	1347 (11.7)**
Bimanual compression	171 (2.8)	241 (2.1)**
Manual removal of placenta	81 (1.3)	156 (1.4)
Transfer (PPH or placental delivery)	81 (1.3)	165 (1.5)
Dilation and curettage	18 (0.3)	41 (0.4)
Blood transfusion	18 (0.3)	39 (0.3)
Postpartum anemia	77 (1.3)	114 (0.9)

Models for predicting PPH by barrier/regulated state

- Adjusting for birth center/home location

- Midwife credential

- Parity and history of prior cesarean and/or history PPH

- Use of preventive pharmaceutical for third stage labor

	OR(95%CI) 500mL PPH	Interpretation
Barrier state	1.26 (1.16-1.38)	26% higher odds for PPH for births in a barrier state *after accounting for above variables*
Birth Center	1.19 (1.07-1.34)	19% higher odds versus home birth
CNM/CM or dual CNM/CPM(LM)	0.42 (0.36-0.48)	48% lower odds compared to CPM/LM/LDM
Multiparous w/ PPH Multip w/ CS hx Multip w/ CS and PPH hx Primiparous	2.27 (1.97-2.62) 1.52 (1.26-1.83) 2.76 (1.74-4.37) 1.85 (1.67-2.04)	127% increased odds 52% increased odds 176% increased odds 85% increased odds
Oxytocin/Methergine use for Preventive action	3.36 (2.92-3.87)	236% increased odds

More severe outcomes

- Barrier state status
  - Did not associate
    - With significantly higher odds for 1000mL blood loss
    - Need for postpartum transport
  - Was associated with 50% higher odds for postpartum anemia compared to births in regulated states.

Take home points

- Maternal history of PPH and/or prior CB represented important predictors for PPH in the community setting (primips too!)

- Having barriers to midwifery practice and/or ability to carry pharmaceuticals may influence PPH prevention/treatment (policy matters!)

- Having barriers to midwifery practice may also influence the kinds of risk factors some clients may have who are seeking community birth (e.g. access to hospital VBAC)

- Use of induction methods or augmentation methods in community setting may indicate a higher risk for future PPH (even when using non-pharmacologic methods!)

Acknowledgements

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Thank you! Questions?