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Perinatal Mood and Breastfeeding: An Analysis Using the 2010-2011 Pregnancy Risk Assessment Monitoring System (PRAMS)

Kathryn Wouk MS

Doctoral Student, Department of Maternal and Child Health
University of North Carolina at Chapel Hill

Thank you for the invitation to present today; it's an honor to share a podium with three amazing researchers who I've had the luck of having as mentors in one way or another in my doctoral program, so you can see UNC a really wonderful place to work on perinatal mood and lactation.

Today I'm going to share results from some work with Dr. Stuebe and Dr. Meltzer-Brody on mood and breastfeeding using the most recent years of the Pregnancy Risk Assessment Monitoring System, otherwise known as PRAMS.

Background

- Perinatal mood symptoms are associated with early breastfeeding cessation
- Both mood symptoms and suboptimal breastfeeding are associated with negative health outcomes for mothers and infants
- The association between perinatal mood and breastfeeding has not yet been explored in a national random sample of U.S. mothers

reduced mother-infant attachment, child development and behavior problems, and increased risk of suicide; early infections and longer term chronic diseases; increased risks of some cancers, type II DM, and cardiovascular disease

Study Objectives

- In a national, stratified, random sample of U.S. mothers, we sought to estimate the associations between:
 - postpartum depression and 3-month any and exclusive breastfeeding
 - pre-pregnancy depression or anxiety and breastfeeding initiation
- Use maps to explore variation in state-level differences in perinatal mood and breastfeeding

As a proxy indicator of women's history of anxiety or depression

We also have data on women reporting postpartum anxiety symptoms for two states, Illinois and Maryland, which we have included in a secondary analysis for a forthcoming paper but won't be presenting here today.

Study Design

- Data from the Pregnancy Risk Assessment Monitoring System (PRAMS)
- State-specific data on maternal attitudes and health behaviors before, during, and after pregnancy
- Sample of women who delivered a live-born infant between Jan 1, 2010 and Dec 31, 2011
- PRAMS questionnaires were administered via mail or telephone interview approximately 2 to 4 months postpartum and then linked to birth certificate data
- 29 states and New York City met the response rate threshold and are included in these analyses

Surveillance program run by the CDC

Primary Exposure: Postpartum Depression

- MDE since birth

Below is a list of feelings and experiences that women sometimes have after childbirth. Read each item to determine how well it describes your feelings and experiences. Then write on the line the number of the choice that best describes how often you have felt or experienced things this way since your new baby was born:

- (A) I felt down, depressed, or sad.
- (B) I felt hopeless.
- (C) I felt slowed down

- Response options on a Likert scale with never=1, rarely=2, sometimes=3, often=4, and always=5.
- We used a validated composite score >9 for diagnosis of MDE

Assessed through the item as listed on this slide

Secondary Exposure: Pre-Pregnancy Mental Health

- Pre-pregnancy health visit to be checked or treated for anxiety or depression:

At any time during the *12 months before* you got pregnant with your new baby, did you do any of the following things? For each item, circle Y (Yes) if you did it or N (No) if you did not.

(A) I visited a health care worker to be checked or treated for depression or anxiety.

- We considered a “Yes” response to be a proxy indicator of pre-pregnancy mental health

Recognizing that this is a crude proxy of pre-pregnancy anxiety and depression, but it was what was available in our data.

Conflating women who might be more likely to be checked because their providers are more likely to screen versus women who are actually experiencing symptoms and seeking treatment.

Outcomes

- Any breastfeeding at 3 months:

“How many weeks or months did you breastfeed or pump milk to feed your baby?” *Any time beginning at 3 months*

- Exclusive breastfeeding at 3 months:

“How old was your new baby the first time he or she drank liquids other than breast milk (such as formula, water, juice, tea, or cow’s milk)?”
and

“How old was your new baby the first time he or she ate food (such as baby cereal, baby food, or any other food)?” *Any time after 3 months*

- Breastfeeding initiation:

“Did you ever breastfeed or pump breast milk to feed your new baby after delivery, even for a short period of time?” *Positive response*

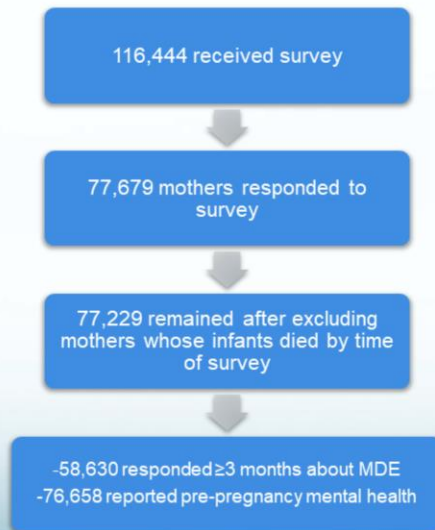
We excluded respondents who were not yet three months postpartum from the analysis of three-month breastfeeding outcomes.

Analyses

- Multivariable logistic regression to estimate the associations between perinatal mood and breastfeeding outcomes
- Maps to highlight state-level prevalence of MDE and pre-pregnancy mental health and of adjusted odds of breastfeeding by MDE and pre-pregnancy mental health status

And we'd love any ideas and suggestions you might have for interpreting the maps, since there are likely people in the audience from all across the country, and we'd love some help in thinking through what state-level conditions, policies, and programs might be explaining some of the differences we see.

Study Population



Sample characteristics

	No Postpartum MDE, N (%)	Postpartum MDE, N (%)
Total	51809 (88.4)	6821 (11.6)
Race/Ethnicity		
White	25761 (87.8)	3572 (12.2)
Black	8013 (87.6)	1133 (12.4)
Hispanic	7866 (89.7)	903 (10.3)
Asian	4027 (92.6)	320 (7.4)
Other	3935 (87.0)	590 (13.0)
Maternal Age		
Less than 18	1379 (86.2)	221 (13.8)
18-24	14956 (86.0)	2439 (14.0)
25-34	27112 (89.3)	3259 (10.7)
35 and older	8360 (90.3)	902 (9.7)
Marital Status		
Not married	20706 (85.4)	3528 (14.6)
Married	31073 (90.4)	3285 (9.6)

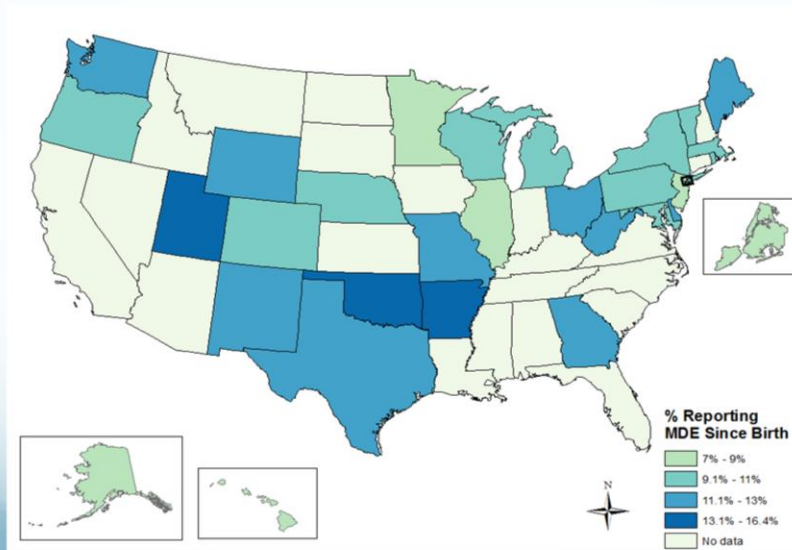
Here are some descriptive statistics for our MDE sample. As you can see, approximately 12% of the 58,630 women reported MDE since birth. Compared to women without MDE, women reporting MDE since birth were more likely to be White, Black, or Other race/ethnicity, younger, and unmarried.

Sample characteristics

	No Postpartum MDE	Postpartum MDE
Income		
Less than \$20,000	17871 (84.6)	3256 (15.4)
\$20,000 to \$49,999	13088 (88.4)	1723 (11.6)
\$50,000 and over	17016 (92.0)	1477 (8.0)
Pre-pregnancy visit for anxiety/depression		
No	45629 (90.4)	4858 (9.6)
Yes	5867 (75.2)	1931 (24.8)
Pregnancy Intention		
Desired	45868 (89.3)	5470 (10.7)
Not desired	5034 (80.4)	1230 (19.6)
Stresses during pregnancy		
None	16304 (94.8)	893 (5.2)
1-2	22024 (90.8)	2232 (9.2)
3-5	11130 (82.0)	2449 (18.0)
6-18	2236 (64.5)	1232 (35.5)

Women reporting MDE were also more likely to be lower income, to have had a pre-pregnancy visit to check or treat for anxiety or depression (supports our use of this variable as indicative of pre-pregnancy mental health), to report the pregnancy as undesired, and to experience more life stresses during pregnancy.

MDE Prevalence Since Birth



States with the highest percentages of women reporting MDE since birth: Utah, Oklahoma, Arkansas

Lowest percentages: Minnesota, New York City, Alaska, Hawaii, New Jersey, Illinois

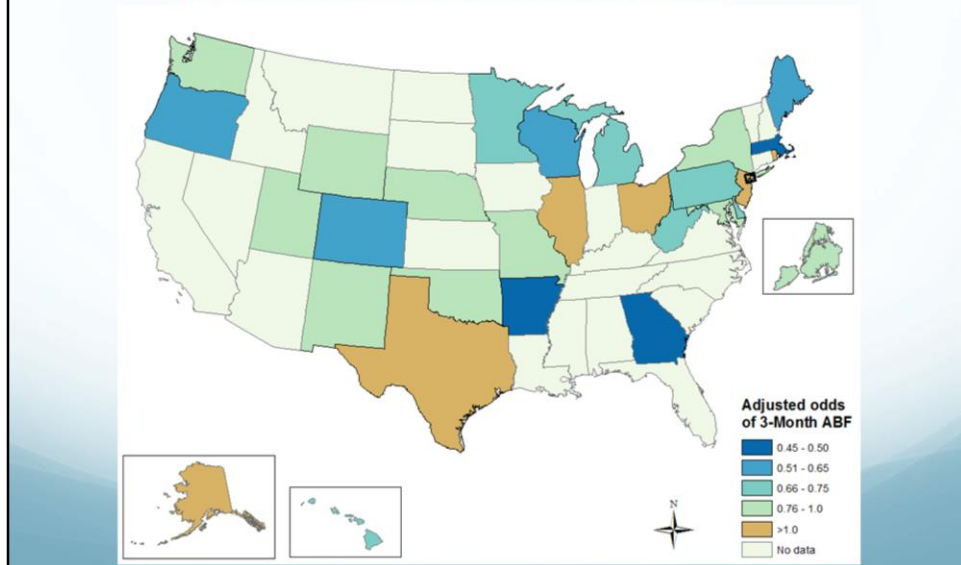
Odds of Any and Exclusive Breastfeeding at 3 Months

	Any Breastfeeding	Exclusive Breastfeeding
MDE v No MDE since birth	OR (95%)	OR (95%)
Crude estimate	0.60 (0.54, 0.67)	0.58 (0.50, 0.68)
Adjusted estimate*	0.77 (0.70, 0.88)	White: 0.65 (0.54, 0.77) Black: 0.41 (0.27, 0.63) Hispanic: 1.08 (0.70, 1.63) Asian: 1.04 (0.58, 1.86) Other: 0.51 (0.26, 1.01)

*Adjusted for race/ethnicity, age, pre-pregnancy mental health visit, prenatal morbidity, pregnancy intention, and stress during pregnancy.

Crude analyses showed that women with MDE since birth have 0.60 times the odds of any breastfeeding and 0.58 times the odds of exclusive breastfeeding at three months compared with women not reporting MDE since birth. Once adjusted for variables identified as confounders, these estimates were somewhat attenuated: Women with MDE since childbirth had 0.77 times the odds of any breastfeeding at three months. We saw differences in the odds of EBF by race with women of Black, Other, and White race/ethnicity having reduced odds and women of Hispanic and Asian race/ethnicity showing no difference.

Adjusted Odds of 3-Month Any Breastfeeding Between Women with and without MDE

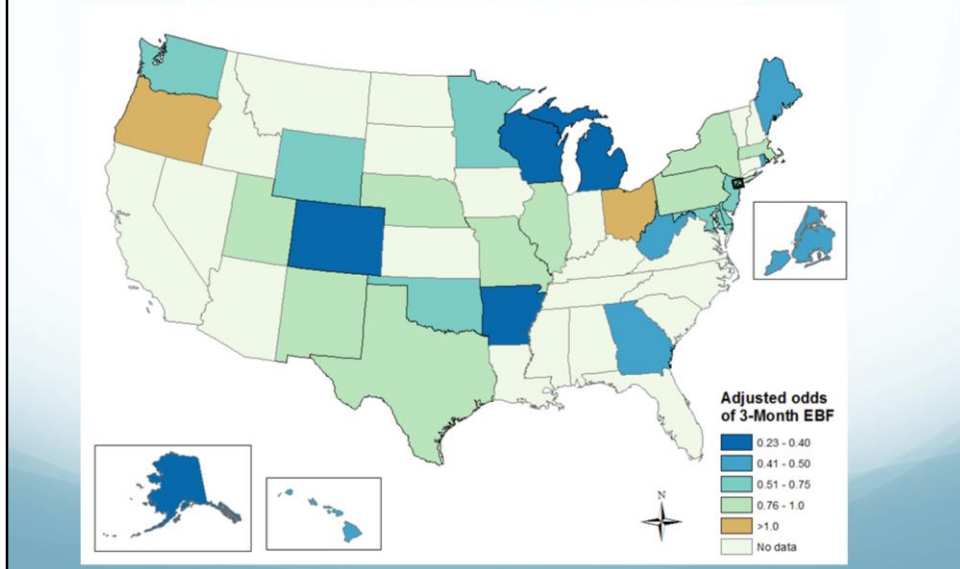


Orange states, Alaska, Texas, Illinois, Ohio, New Jersey, and Rhode Island, where the outcome is the reverse of what we'd expect: women with MDE since birth actually have higher odds of breastfeeding at 3 months compared to women without MDE

Light green: smaller difference between the odds

Dark blue: most sizeable reduced odds of any breastfeeding → Georgia, Massachusetts, Arkansas,

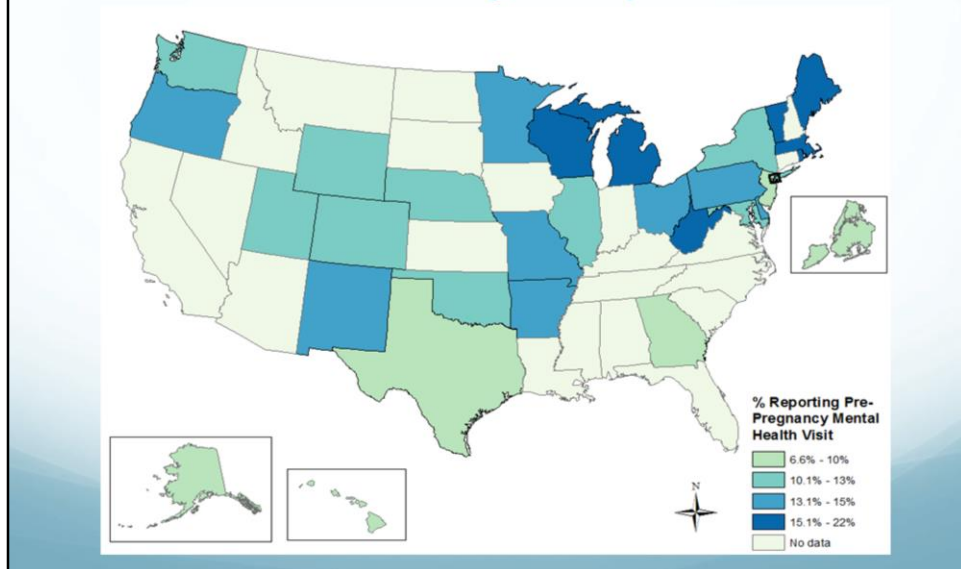
Adjusted Odds of 3-Month Exclusive Breastfeeding Between Women with and without MDE



Outlier orange states: Oregon and Ohio; Oregon has one of the highest prevalences of women EBF at 3 months, so may be that breastfeeding support is strong in general, and especially for women with mental health symptoms. However, this contrasts with a state like Colorado, which also has a high prevalence of EBF at 3 months, but here shows that women with depression symptoms after birth have an extremely reduced odds of breastfeeding; in Colorado this subpopulation may need more targeted support.

Dark blue: sizeable reduced odds of exclusive breastfeeding at three months for women with MDE: Arkansas, both a high prevalence of MDE and reduced odds of ABF as well, so pretty consistent picture; Colorado, Michigan, Wisconsin, Alaska, where depressed women actually had slightly higher odds of ABF

Prevalence of Pre-Pregnancy Mental Health Visits for Anxiety or Depression



Overall, approximately 13.4% of 76,658 women in the sample reported having had a health care visit to be checked or treated for anxiety and depression in the 12 months before pregnancy.

States with the largest percentage of women reporting a pre-pregnancy mental health visit: Maine, Vermont, Massachusetts, Rhode Island, West Virginia, Michigan, Wisconsin

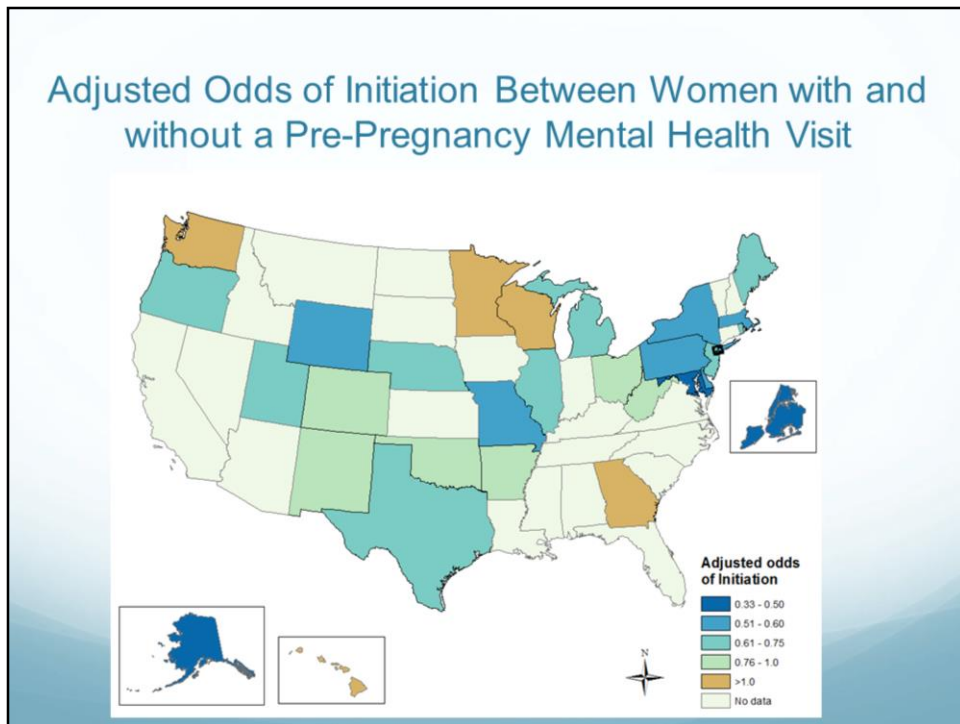
Light green: lowest percentage of women reporting: Texas, Alaska, Hawaii, New York City, Georgia, New Jersey → mixing together places where anxiety and depression may be more prevalent and areas where health care is more likely to check and treat

Odds of Breastfeeding Initiation

	Breastfeeding Initiation
Pre-pregnancy mental health visit v. No visit	OR (95%)
Crude estimate	0.60 (0.55, 0.66)
Adjusted estimate*	0.70 (0.63, 0.77)

*Adjusted for maternal race/ethnicity, income, and pregnancy intention.

The crude odds of breastfeeding initiation for women reporting a pre-pregnancy visit for depression or anxiety are 0.60 times the odds for women reporting no pre-pregnancy visit. After adjustment for maternal race/ethnicity, income, and pregnancy intention, the odds of initiation were only slightly attenuated: women with a pre-pregnancy mental health visit have times the odds of initiating compared with women who report no pre-pregnancy visit for depression or anxiety.



Again, a few outlier states

In Alaska, New York City, Maryland, women with a pre-pregnancy mental health visit have most extreme reduced odds of breastfeeding compared to women without this visit

Even though WVA and Wisconsin had large percentages of women reporting this pre-pregnancy visit, they don't show sizeable differences in odds of breastfeeding initiation → WVA has low initiation rates, so there may be little breastfeeding support regardless of mental health barriers; this contrasts with Wisconsin, where BF initiation is high across the state, so there may be generally better support for both women with a history of anxiety and depression as well as those without. So as in the case of EBF, we see some states with similar mood prevalences and BF outcomes despite very different state-level contexts.

Conclusions

- In a national, stratified, random sample of U.S. mothers, we found that perinatal mood symptoms are associated with reduced breastfeeding initiation, duration and intensity
- Maps of participating states and New York City illustrate the generally reduced odds of breastfeeding among women with perinatal mood symptoms

Welcome any ideas you may have about state levels policies and programs that may explain some of that variation.

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MPH New Jersey—Ingrid M. Morton, MS New Mexico—Eirian Coronado, MPH New York State—
Anne Radigan-Garcia New York City—Candace Mulready-Ward, MPH North Carolina—Kathleen
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Virginia—Christopher Hill, MPH, CPH Washington—Linda Lohdefinck West Virginia—Melissa
Baker, MA Wisconsin—Katherine Kvale, PhD Wyoming—Amy Spieker, MPH CDC PRAMS Team,
Applied Sciences Branch, Division of Reproductive Health.