



# Bridging Mental Health Care with Pregnancy Care to Prevent Perinatal Depression

---

Ellen Tilden, PhD CNM and Taylor Shank, PhD



# Thank you!

- OHSU Biomedical Innovations Program
- Oregon Business Development
- National Institutes of Mental Health

## Disclosure

- Co-founder and CSO of Center Mom, Inc., not for profit startup

## Language

‘pregnant women and mothers’ + ‘pregnant people and parents’

# Maternal Mental Health Disorders

THE MOST **COMMON**, **DEADLY**, and **PREVENTABLE** PERINATAL COMPLICATION



~1 in 4

women suffer from maternal  
mental health disorders



<15%

of women receive treatment

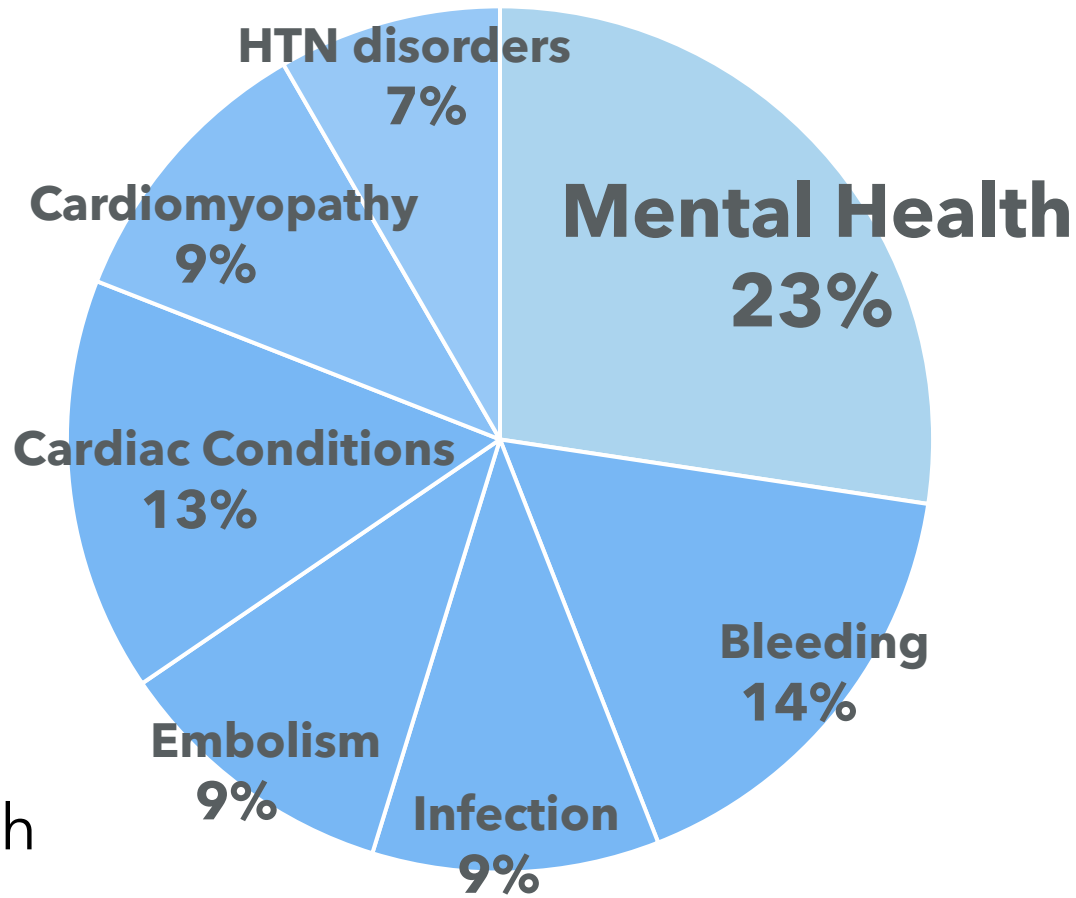


#1

leading cause of maternal  
death in the year after birth

100%

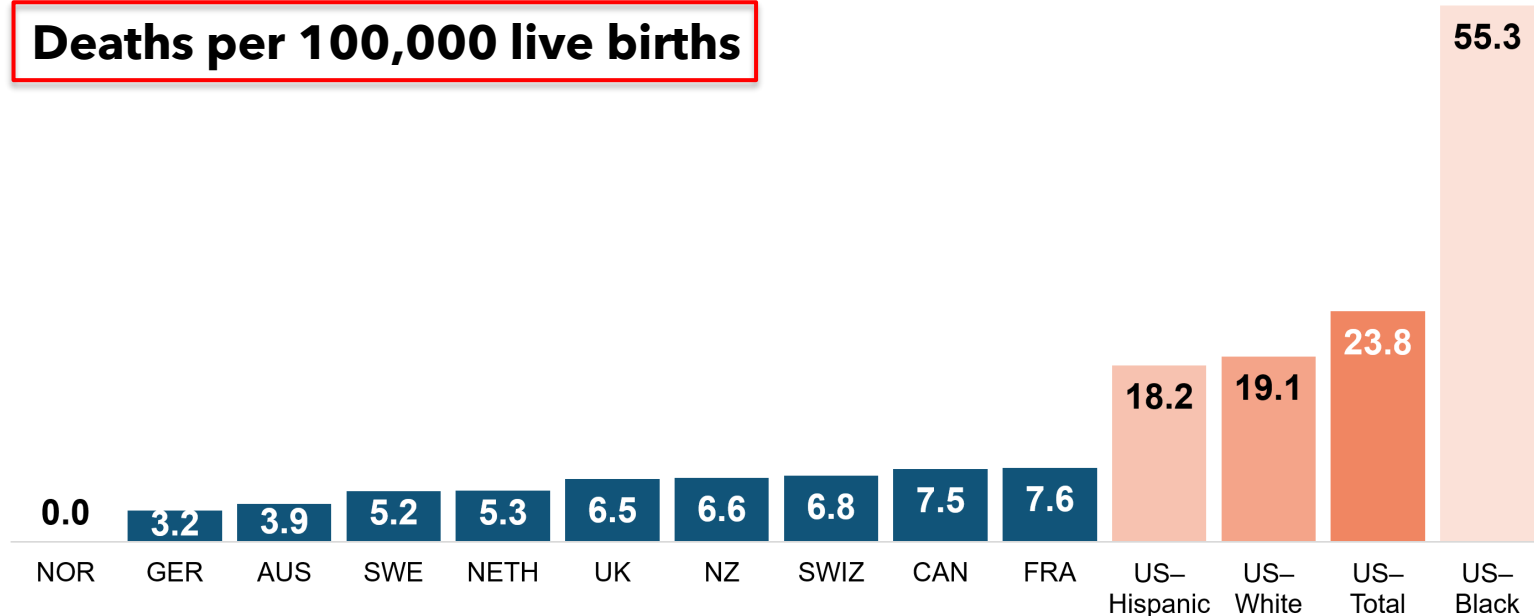
**PREVENTABLE**



Maternal death  
CDC 2023

# The maternal mortality rate is highest in the US

Deaths per 100,000 live births



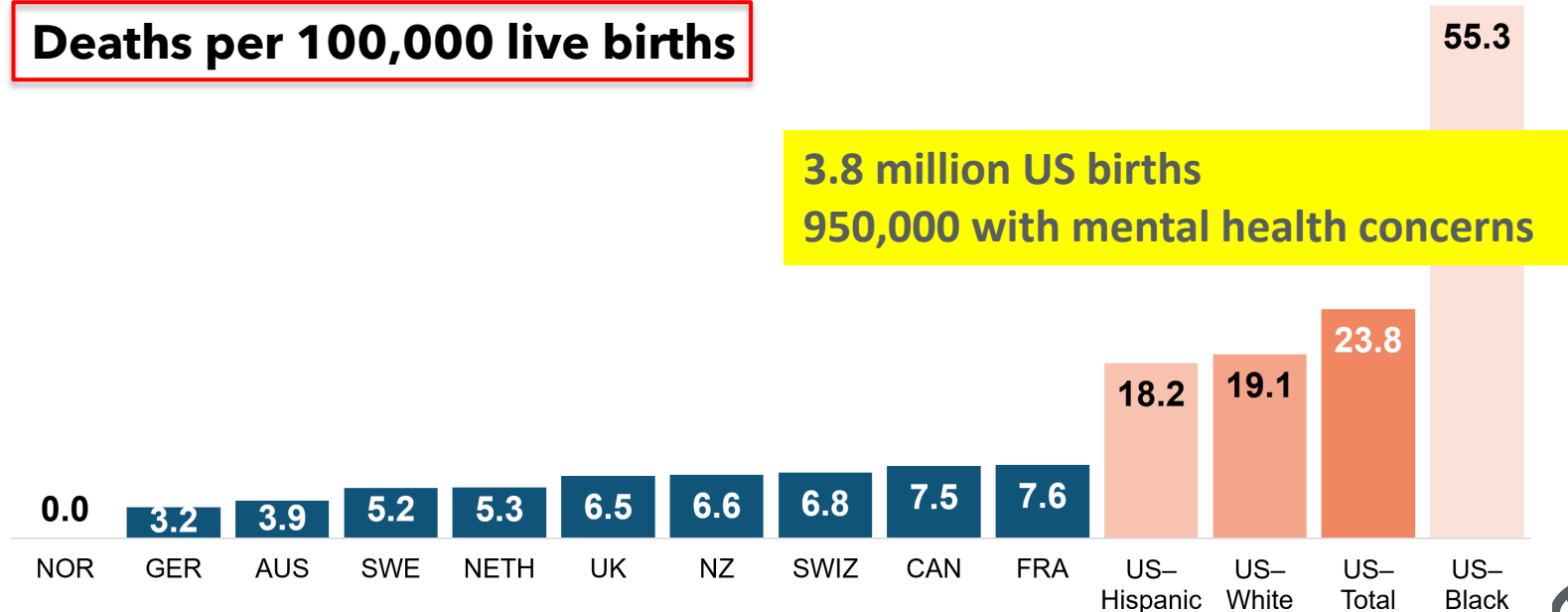
Notes: The maternal mortality ratio is defined by the World Health Organization as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. 2015 data for FRA; 2017 data for NZ and UK; 2018 data for SWIZ; 2019 data for AUS, CAN, GER, NETH, NOR, and SWE; 2020 data for US.  
Data: Data for all countries except US come from OECD Health Data 2021. Data for US come from Donna L. Hoyert, *Maternal Mortality Rates in the United States, 2020* (National Center for Health Statistics, Feb. 2022).

Source: Munira Z. Gunja et al., *Health and Health Care for Women of Reproductive Age: How the United States Compares with Other High-Income Countries* (Commonwealth Fund, Apr. 2022).

<https://doi.org/10.26099/4pph-i894>

# The maternal mortality rate is highest in the US

Deaths per 100,000 live births



Notes: The maternal mortality ratio is defined by the World Health Organization as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. 2015 data for FRA; 2017 data for NZ and UK; 2018 data for SWIZ; 2019 data for AUS, CAN, GER, NETH, NOR, and SWE; 2020 data for US.  
Data: Data for all countries except US come from OECD Health Data 2021. Data for US come from Donna L. Hoyert, *Maternal Mortality Rates in the United States, 2020* (National Center for Health Statistics, Feb. 2022).

Source: Munira Z. Gunja et al., *Health and Health Care for Women of Reproductive Age: How the United States Compares with Other High-Income Countries* (Commonwealth Fund, Apr. 2022).

<https://doi.org/10.26099/4pph-i894>

## Trends in maternal mortality 2000 to 2020

Estimates by WHO, UNICEF, UNFPA, World Bank Group  
and UNDESA/Population Division



## Maternal Deaths per 100,000 Births

	2000	2005	2010	2015	2020
UK	11	11	10	8	11
USA	12	13	14	17	21

## Trends in maternal mortality 2000 to 2020

Estimates by WHO, UNICEF, UNFPA, World Bank Group  
and UNDESA/Population Division



## Maternal Deaths per 100,000 Births

	2000	2005	2010	2015	2020
UK	11	11	10	8	11
USA	12	13	14	17	21





The New York Times

**The New York Times**

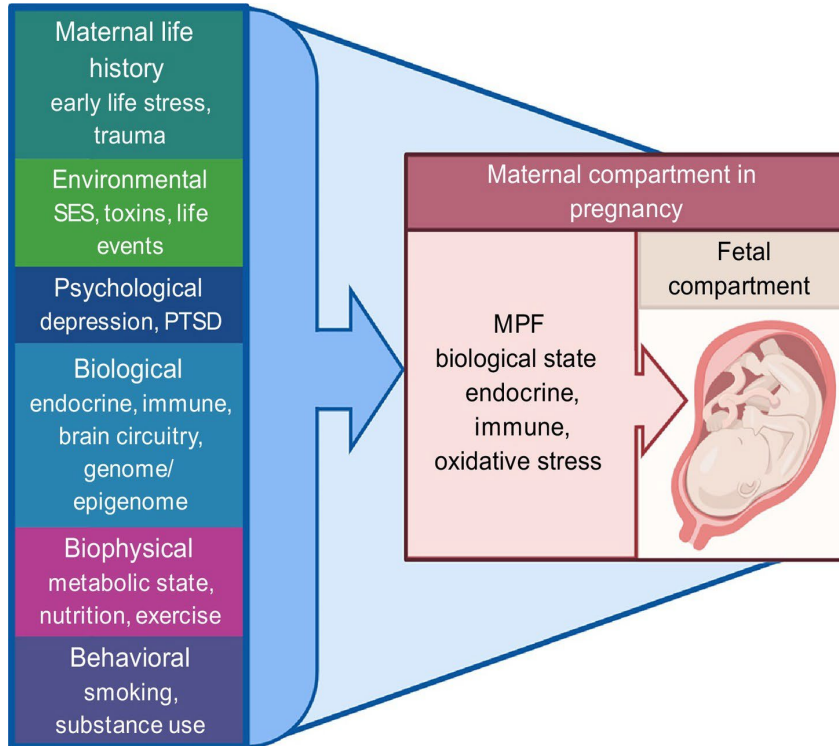
**'Covid Worsened  
A Health Crisis  
Among Pregnant  
Women'**

**March 16, 2023**

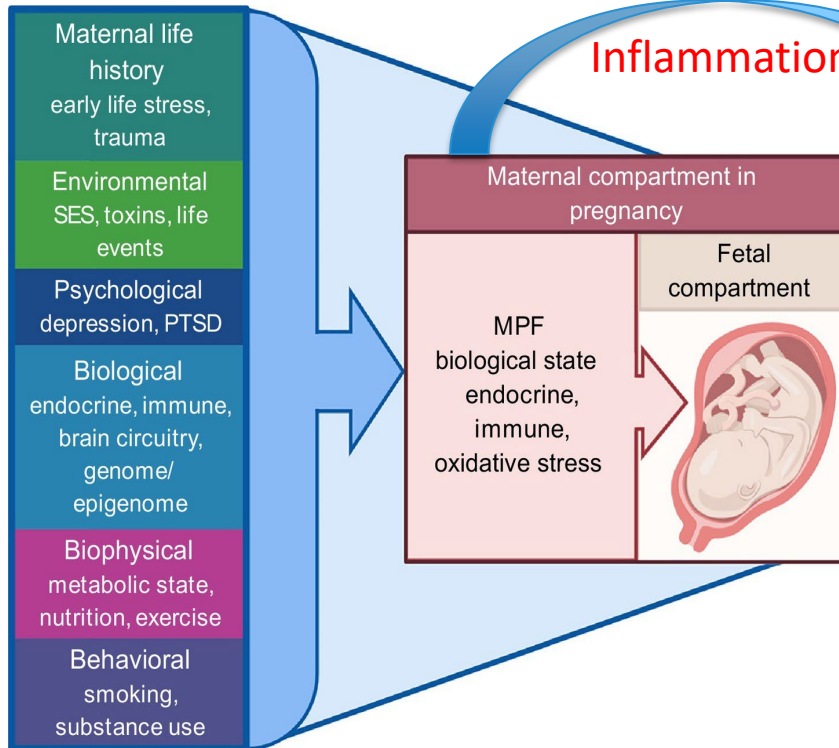
***Covid Worsened a Health Crisis Among  
Pregnant Women***

In 2021, deaths of pregnant women soared by 40 percent in the United States, according to new government figures. Here's how one family coped after the virus threatened a pregnant mother.

# Biological pathways for effects of prenatal conditions on neurodevelopment



# Biological pathways for effects of prenatal conditions on neurodevelopment



## Review

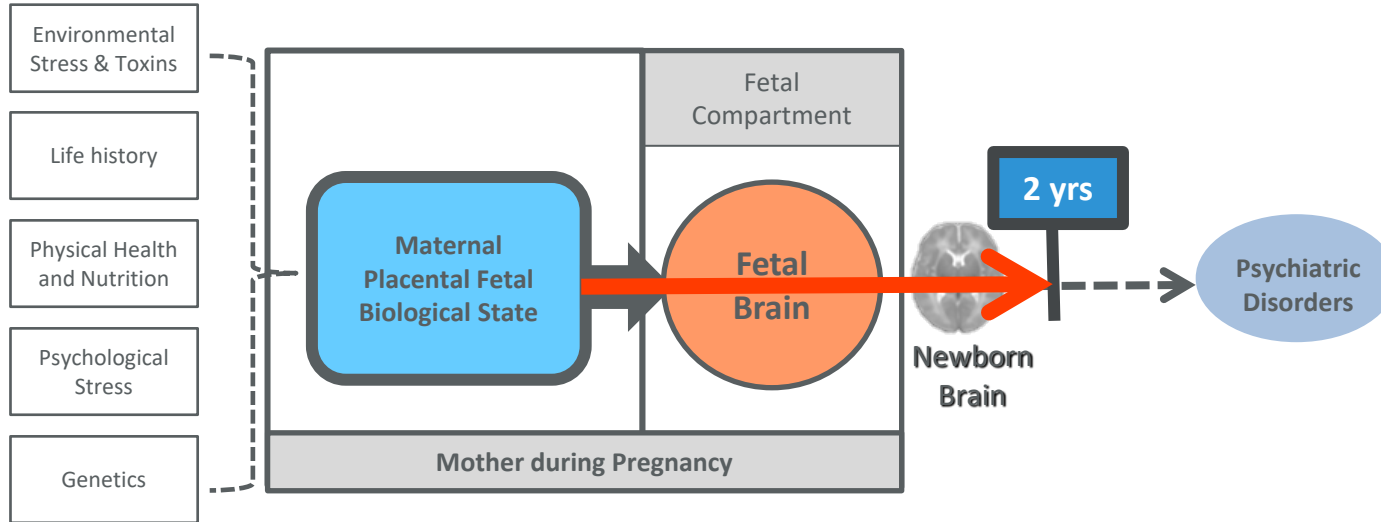
### Effects of Maternal Psychological Stress During Pregnancy on Offspring Brain Development: Considering the Role of Inflammation and Potential for Preventive Intervention

Alice M. Graham, Olivia Doyle, Ellen L. Tilden, Elinor L. Sullivan, Hanna C. Gustafsson, Mollie Marr, Madeleine Allen, and Kristen L. Mackiewicz Seghete

### Maternal Systemic Interleukin-6 During Pregnancy is Associated with Newborn Amygdala Phenotypes and Subsequent Behavior at 2-years-of-age

[Alice M. Graham](#),<sup>a</sup> [Jerod M. Rasmussen](#),<sup>b</sup> [Marc D. Rudolph](#),<sup>a</sup> [Christine M. Heim](#),<sup>c,d</sup> [John H. Gilmore](#),<sup>e</sup> [Martin Styner](#),<sup>e</sup> [Steven G. Potkin](#),<sup>f</sup> [Sonja Entringer](#),<sup>b,c</sup> [Pathik D. Wadhwa](#),<sup>b</sup> [Damien A. Fair](#),<sup>a,g</sup> and [Claudia Buss](#)<sup>b,c</sup>

# Relevance of Findings for Emerging Behavior?

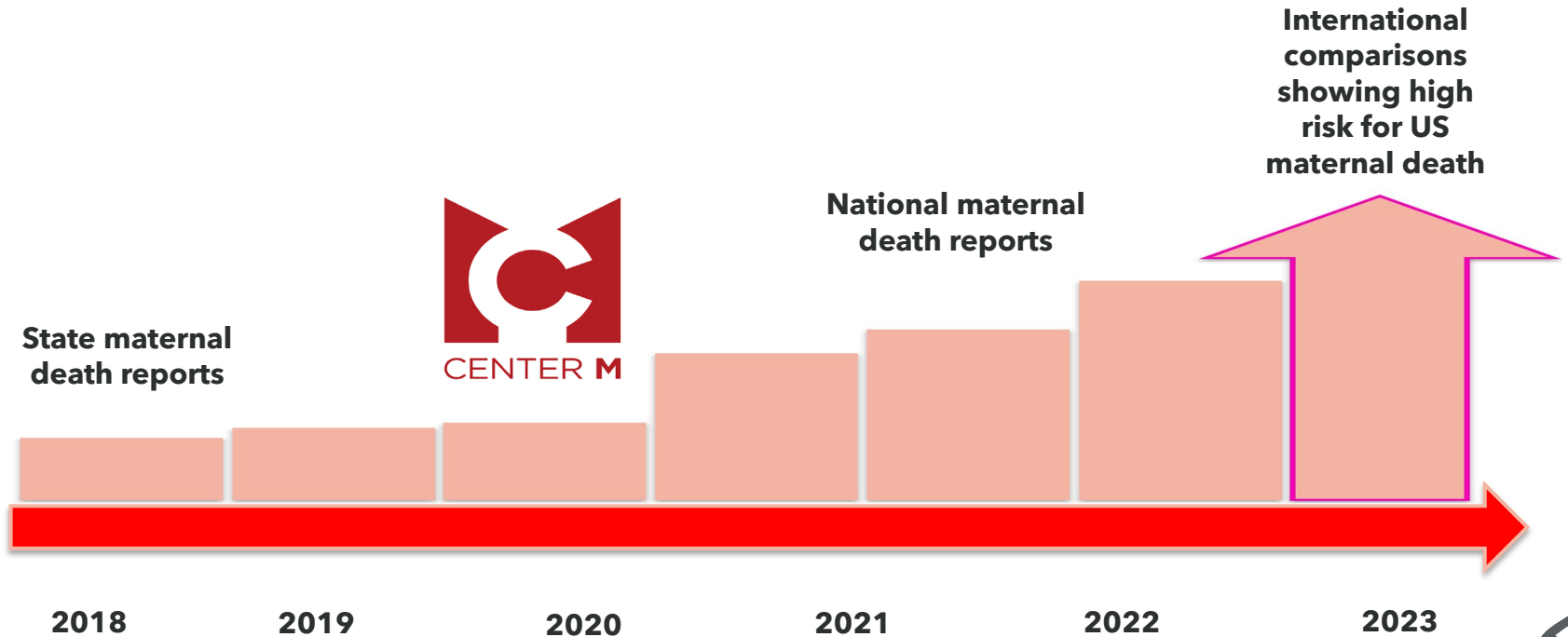


## Impulse Control

- Associated with behavioral, emotional and health outcomes in childhood
- Difficulties with impulse control common across psychiatric disorders
- Snack Delay (Kochanska et al., 2000)



# Mental Health Issues Drive Maternal Death



# Prenatal care: we can do better

I have so many concerns



I have 10 minutes per patient

# Prenatal care: we can do better

I have so many concerns

Am I depressed?



I have 10 minutes per patient

I'm not a mental health provider

# Prenatal care: we can do better

I have so many concerns

Am I depressed?



I have 10 minutes per patient

I'm not a mental health provider

**'I was told I can only ask 2 questions at each prenatal care appointment'**





**Prenatal  
Health  
Care**

**Mental  
Health  
Care**



**CENTER M**

# Our team



**Ellen Tilden,  
PhD, CNM**

OHSU Associate  
Professor

Nurse-midwife  
20+ years

Clinical scientist

Mother of 2



**Kristen  
Mackiewicz  
Seghete, PhD**

OHSU Associate  
Professor

Psychologist  
11+ years

Clinical scientist

Mother of 2



**Roberta Hunte,  
PhD**

PSU Assistant  
Professor

Health Equity 11+  
years

Clinical scientist

Mother of 2



**Veronica Eyo,  
LCSW, EdD**

Private practice  
social worker

Caring for Black  
mothers' mental  
health

Mother of 3

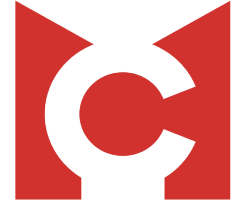


**Nisha  
Supahan, BA**

Karuk Tribal  
Spiritual  
Leader

Small business  
owner

Mother of 5



**CENTER M**  
*Implementation*

*Health Systems*  
*Billing/Coding*  
*Medicaid Policy*

*Business*

*Public Health*

*County Government*  
*Community Partners*



A woman with long braids is shown in a meditative state, sitting cross-legged with her eyes closed. She is wearing a light blue long-sleeved shirt. The background is a bright, warm-toned room with a wooden pillar and a white shelf with some items.

## Original Mindfulness CBT Model

In person

Psychologist led

Not culturally tailored

8 session x 2 hours each

Academic

Paper based home practice

No depression screening

**Mindfulness-Based CBT leads to a**

**74%** reduction

**in perinatal depression**



Mindfulness-Based CBT leads to a

**74%** reduction

in perinatal depression

## Original Mindfulness CBT Model

In person

Psychologist led

Not culturally tailored

8 session x 2 hours each

Academic

Paper based home practice

No depression screening

**Strong Science**

+

**Hard to Access**

=

**Unrealized Potential**

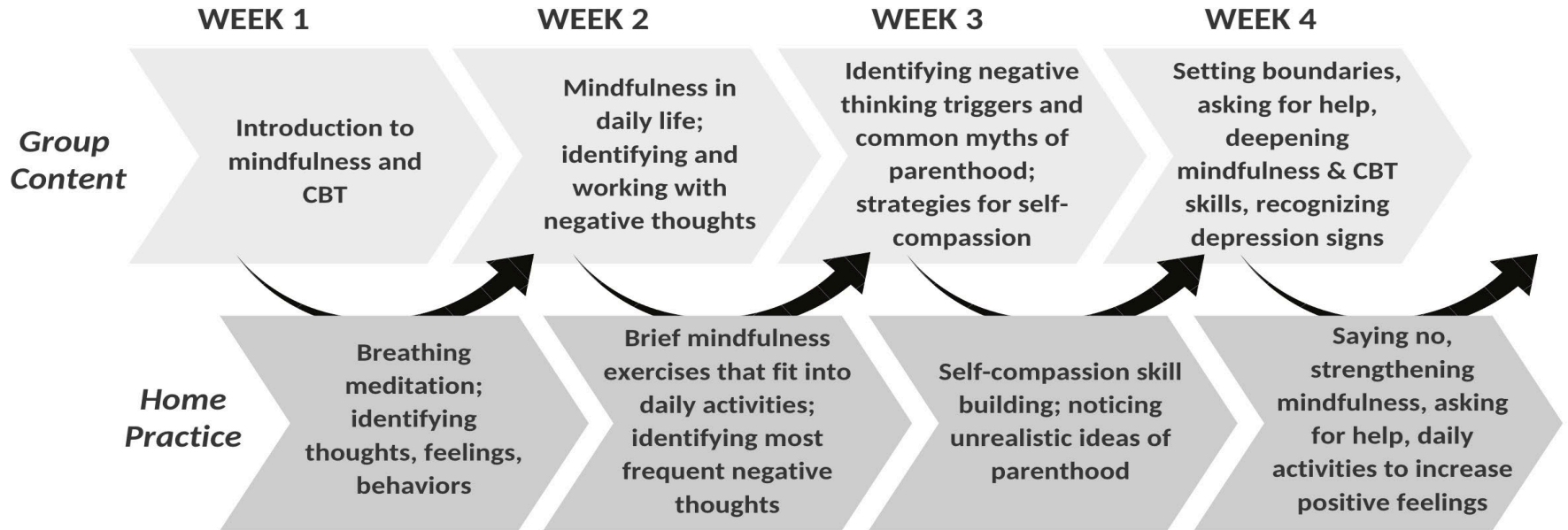


# Center M adapts Mindfulness CBT to increase access

Mindfulness CBT	Center M
In person	Telehealth
Psychologist led	Social worker led
Not culturally tailored	Targets cultural tailoring
8 sessions	4 sessions
Academic	Scalable in standard care
Paper based home practice	Smartphone app home practice
No depression screening	Depression screening

One social worker + 3-5 pregnant women meet on Zoom weekly for 1 hour over 4 sessions

Home practice between group sessions



"Center M is like taking a daily prenatal vitamin  
for my mental health"

PREVENTION = DAILY



# Center M Pilot Results

---

- Mindful awareness scores increased significantly ( $p=.016$ ) over four sessions, predicting significant depression measure decreases ( $p=.010$ )
- Focus groups demonstrate high stakeholder interest, accessibility and satisfaction
- Social workers can be efficiently trained in the model via three, two-hour training sessions



✓ **Busting silos, building bridges**

maternity care and mental health care, community and academy

✓ **Busting silos, building bridges**

maternity care and mental health care, community and academy

✓ **Building together**

patients, community partners, business, OHSU clinicians and scientists

✓ **Busting silos, building bridges**

maternity care and mental health care, community and academy

✓ **Building together**

patients, community partners, business, OHSU clinicians and scientists

✓ **Data driven**

10 y research, promising pilot results

✓ **Busting silos, building bridges**

maternity care and mental health care, community and academy

✓ **Building together**

patients, community partners, business, OHSU clinicians and scientists

✓ **Data driven**

10 y research, promising pilot results

✓ **Hybrid: in person and telehealth**

relationship-centered with digital supports

✓ **Busting silos, building bridges**

maternity care and mental health care, community and academy

✓ **Building together**

patients, community partners, business, OHSU clinicians and scientists

✓ **Data driven**

10 y research, promising pilot results

✓ **Hybrid: in person and telehealth**

relationship-centered with digital supports

✓ **FITS:**

→ pregnant people

→ prenatal care clinical workflow

→ prenatal care payment structure

→ screening targets/quality measures

OHSU → Oregon → US

**Initial pilot  
OHSU testing  
Early publications**

**2019 - 2020**

**Greatly widening  
CCO/state partnerships**

**Currently expanding to 5  
additional Oregon prenatal  
care clinics**

**Rural Oregon outreach**

**2020 - 2023**

**Broader testing  
and refinement in clinics  
with underserved populations**

**Wider cultural tailoring  
Spanish translation**

**Expansion to other states**

**Secure federal funding + publish**

**2024 +**

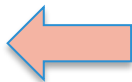


# Oregon



## STTR AIM 1

Focus groups: Testing and improving smartphone app to deliver home practice materials (e.g., meditations)



- Pregnant
- Age 18-50
- English-Fluent

## STTR AIM 2

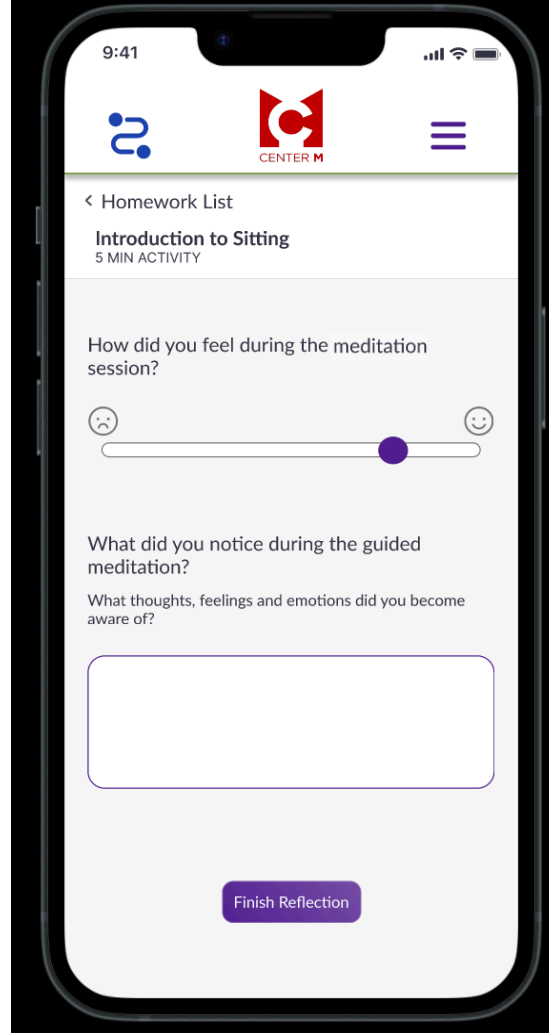
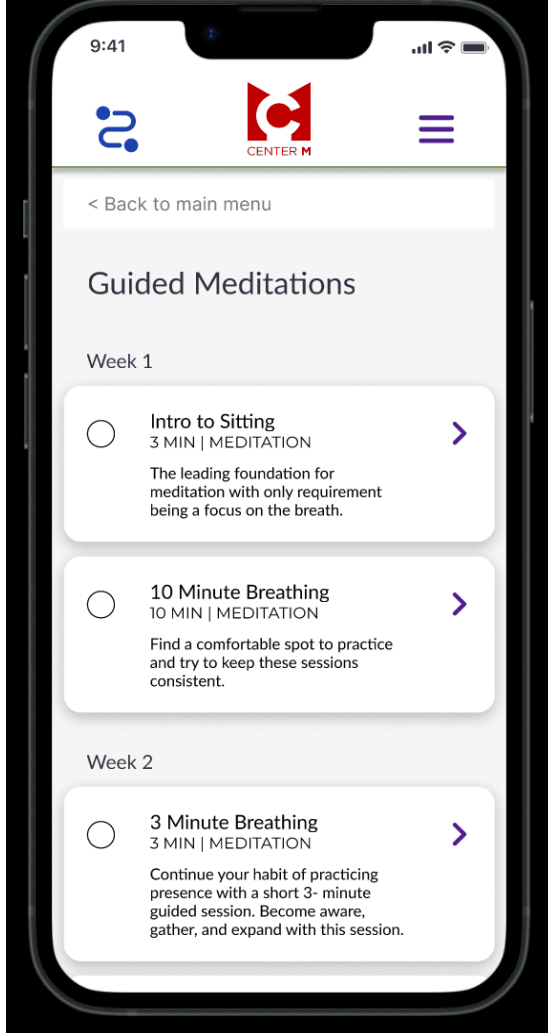
Randomized controlled trial- 90 people  
Center M vs. usual prenatal care

- >OHSU FM Richmond
- >OHSU FM Scappoose
- > OHSU Hillsboro Medical Center
- >OHSU Center for Women's Health
- >Providence New Beginnings
- >Healthy Birth Initiative

### SEEKING ADDITIONAL CLINICAL SITES

Ellen Tilden: [tildene@ohsu.edu](mailto:tildene@ohsu.edu)

Taylor Shank: [shank@ohsu.edu](mailto:shank@ohsu.edu)





# Helping one to help many... over a lifetime



- ↑ Child health and well-being
- ↑ Social connection and support
- ↑ Lifelong happiness
- ↑ Lifelong mental health
- ↑ Lifelong physical health

- ↓ Parental stress
- ↓ Marital stress
- ↓ Anxiety



Thank You!

Questions?

Ellen Tilden [tildene@ohsu.edu](mailto:tildene@ohsu.edu)

Taylor Shank [shank@ohsu.edu](mailto:shank@ohsu.edu)