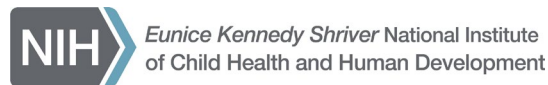


# NIH Supported Maternal Mortality Research and Opportunities

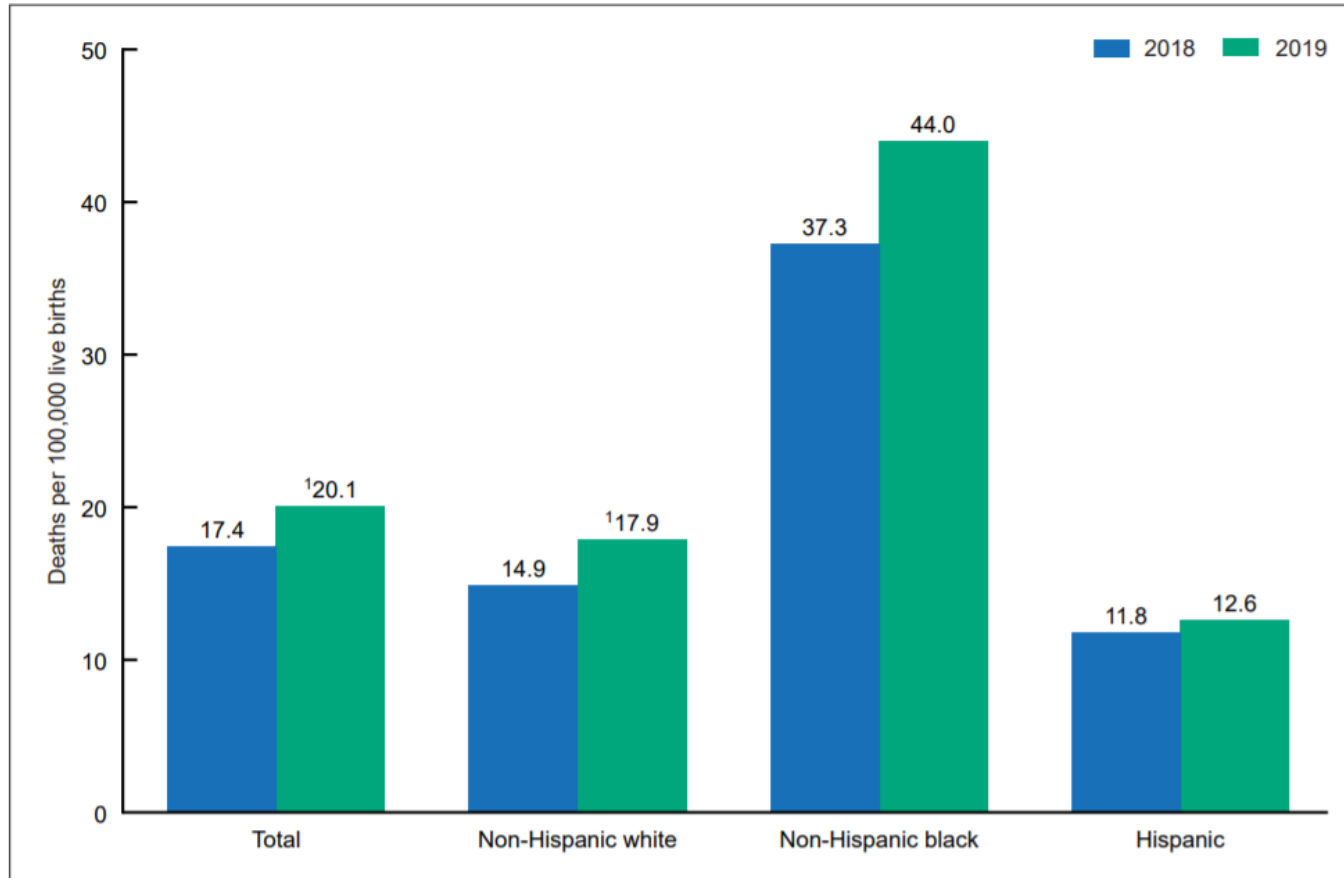
Presented at the National Academies of  
Sciences, Engineering and Medicine Workshop on  
“Advancing Maternal Health Equity and Reducing Maternal Mortality”  
June 8, 2021

*Juanita J. Chinn, PhD*



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@JJChinnPop

# Maternal Mortality Rates by Race and Hispanic Origin: United States, 2018–2019



Death of a person while pregnant or *within 42 days/6 weeks* of being pregnant, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

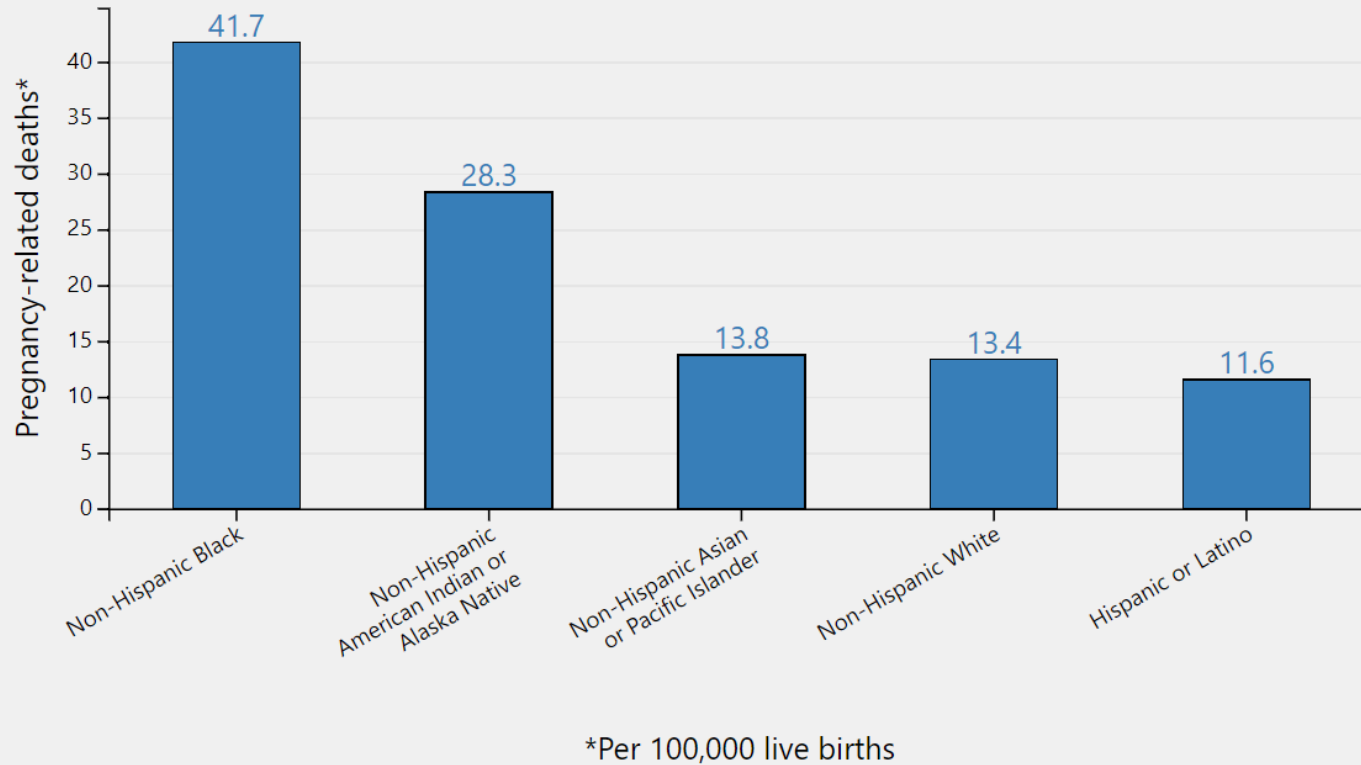
<sup>1</sup>Statistically significant increase in rate from 2018 to 2019 ( $p < 0.05$ ).

NOTE: Race groups are single race.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.



# Pregnancy-Related Mortality by Race and Hispanic Origin: United States, 2014–2017



Death of a person while pregnant or *within 1 year* of the end of a pregnancy, regardless of the outcome, duration or site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes



# Leading Causes of Pregnancy-Related Deaths: United States, 2014-2017

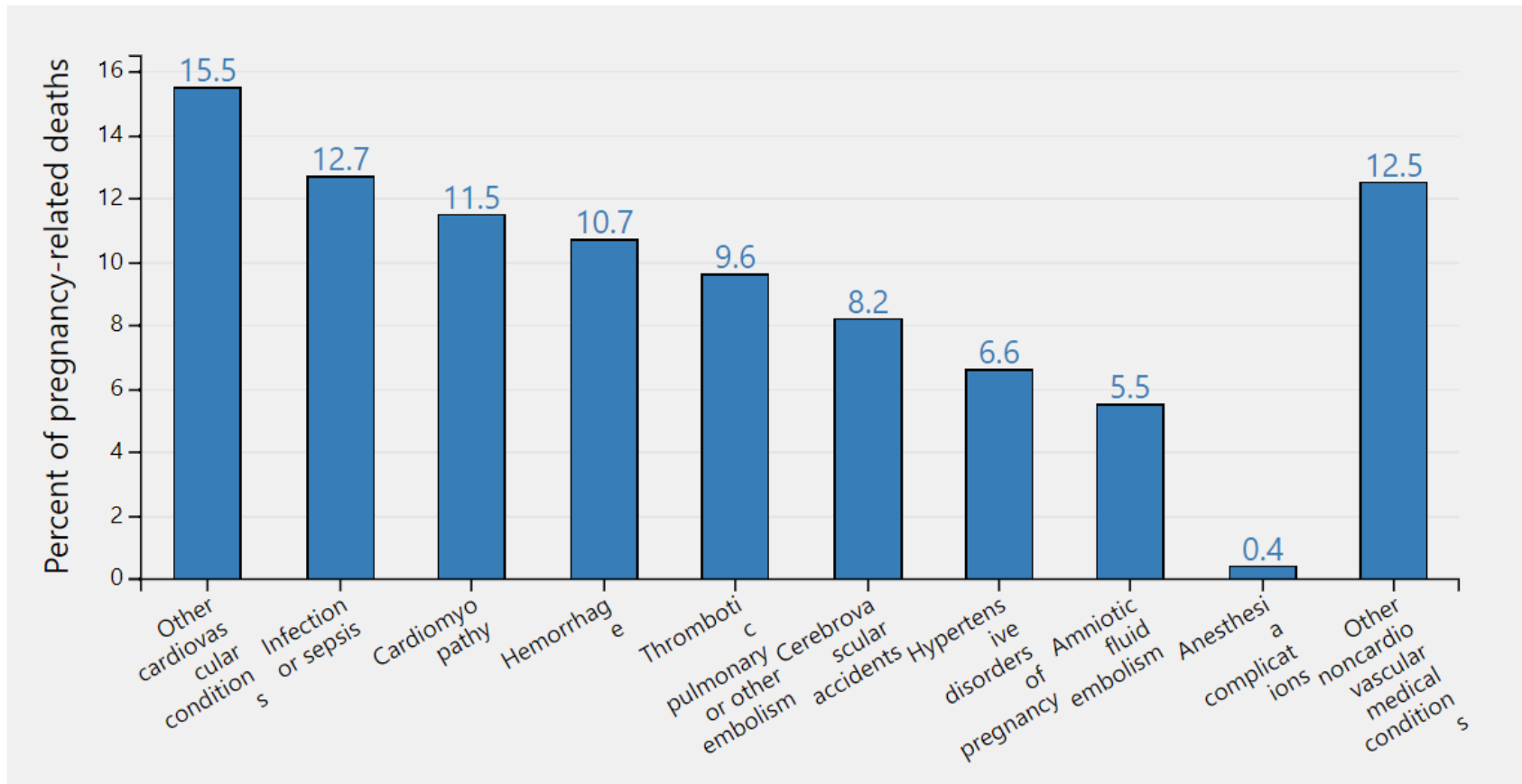


Figure and Data Source: <https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm#trends>



# Leading Causes of Pregnancy-Related Deaths: United States, 2016-2017

Analyzed literal cause of death data to identify and adjust in the collection and coding of data on maternal deaths



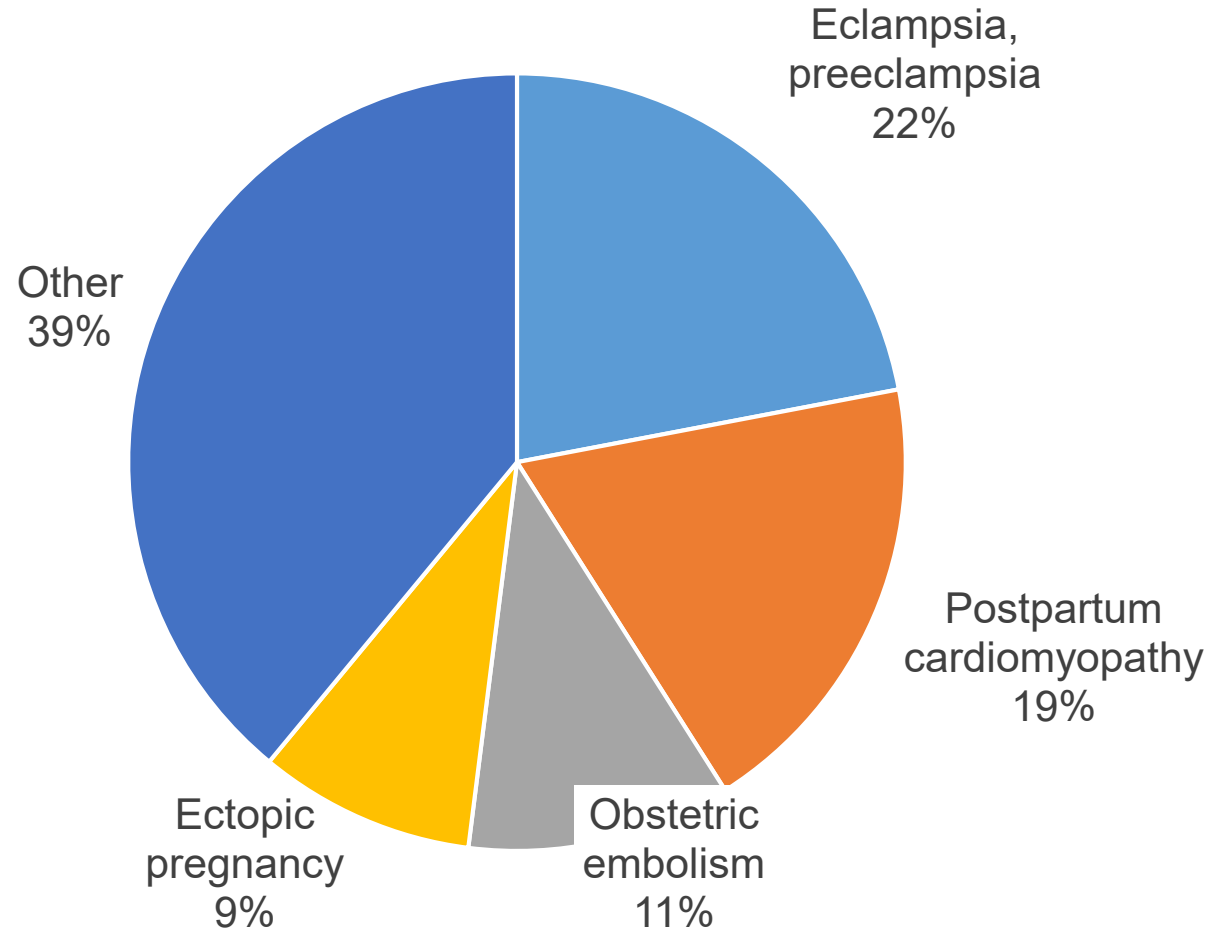
# Leading Causes of Pregnancy-Related Deaths: United States, 2016-2017

Analyzed literal cause of death data to identify and adjust in the collection and coding of data on maternal deaths

- Black non-Hispanic /White non -Hispanic disparities in maternal mortality may be greater than reported
- Excess maternal mortality risk for Black NH women was concentrated among a few causes of death
  - 5 X's higher for eclampsia/preeclampsia, postpartum cardiomyopathy, and complications of obstetric surgery
  - 2-3 X's higher for obstetric embolism and hemorrhage
- Few causes contribute to overall Black NH / White NH disparity
  - Eclampsia/preeclampsia, 22%
  - Postpartum cardiomyopathy, 19%
  - Obstetric embolism, 11%
  - Ectopic pregnancy, 9%



# More than Half of Black NH /White NH Disparity is Attributable to Four Causes



Marian MacDorman et al.

7 Presented at Population Association of America May 2021

R21-HD095236



# Severe Maternal Morbidity California 2007-2014

- Racial and ethnic disparities in severe maternal morbidity have *persisted and increased*
- Known risk factors for these complications, such as blood pressure disorders, asthma and Caesarean birth, do not fully explain the increase in disparities or why the racial and ethnic disparities persist
- Changes in the prevalence of these risk factors do not account for the increase in severe maternal morbidity during this time period

F32HD091945

Leonard, Stephanie A, EK Main, KA Scott, J Profit, SL Carmichael. 2019. Racial and Ethnic Disparities in Severe Maternal Morbidity Prevalence and Trends. *Annals of Epidemiology* 33:30-36.

Leonard, Stephanie A, EK Main, SL Carmichael. 2019. The contribution of maternal characteristics and cesarean delivery to an increasing trend of severe maternal morbidity. *BioMed Central Pregnancy and Childbirth*. 19(16).





# Access to *High Quality Care*

- Data from New York City
- Women from racial and ethnic minority groups give birth in hospitals with
  - Lower overall quality
  - Higher rates of severe maternal morbidity
- Black and Latina women giving birth in low performing hospitals report:
  - Poor patient-provider communication
  - Trauma
  - Difficulties in obtaining prenatal & postpartum care

5 R01 MD007651-05

Howell EA, Zeitlin J. Improving hospital quality to reduce disparities in severe maternal morbidity and mortality. *Semin Perinatol* 2017; 41(5):266-272.

Howell EA, Egorova NN, Janevic R, Brodman M, Balbierz A, Zeitlin J et al. Race and Ethnicity, Medical Insurance, and Within-Hospital Severe Maternal Morbidity Disparities. *Obstet Gynecol* 2020;135:285-93.

Howell EA. Maternal Mortality: Disparities and Health Inequities NICHD Maternal Mortality Workshop. Lecture presented at: Maternal Mortality in the United States: Future Research Directions Workshop May 3, 2019; Rockville, MD



# Research Highlight: Maternity Care Deserts and Pregnancy-associated Mortality

- Recent publication by NICHD-funded researcher examined maternal mortality in Louisiana
- Risk of death during pregnancy and up to 1 year postpartum due to any cause and in particular death due to obstetric causes was significantly elevated among women residing in maternity care deserts compared to women in areas with greater access
- A large **racial inequity** in risk (2.2 X greater) persisted above and beyond differences in geographic access to maternity care



# Pregnancy Associated Mortality

## Data from Louisiana, 2016-2017

**12.9** homicide deaths  
for every 100,000 women  
who were pregnant or postpartum

Homicide accounts for more deaths of pregnant and postpartum women than any single obstetric cause, including

- Hypertensive disorders (3.2 / 100k)
- Amniotic fluid entering the bloodstream (4.8 / 100k)

R01HD092653

Wallace, Maeve E, J Crear-Perry, P Mehta, and KP Theall, 2020. Research Letter: Homicide during pregnancy and the postpartum period in Louisiana, 2016-2017. *JAMA Pediatrics*.

Wallace, Maeve E, D Hoyert, C Williams, P Mendola, 2016. Pregnancy-associated homicide and suicide in 37 US states with enhanced pregnancy surveillance. *American Journal of Obstetrics and Gynecology*. 215(3).



# Pregnancy Associated Mortality

## Data from Louisiana, 2016-2017

Pregnancy increases risk of homicide among women, particularly young women

- **Risk of homicide is doubled** for women and girls **during pregnancy and the postpartum period**, compared to other women and girls
- Highest for women and girls ages 10 to 29
- Pregnancy-associated homicide is **three times higher** for **non-Hispanic Black women** than non-Hispanic White women *nationally*

R01HD092653

Wallace, Maeve E, J Crear-Perry, P Mehta, and KP Theall, 2020. Research Letter: Homicide during pregnancy and the postpartum period in Louisiana, 2016-2017. JAMA Pediatrics.

Wallace, Maeve E, D Hoyert, C Williams, P Mendola, 2016. Pregnancy-associated homicide and suicide in 37 US states with enhanced pregnancy surveillance. American Journal of Obstetrics and Gynecology. 215(3).



# Police Violence and Maternal & Infant Health

- Research examining women in, and around, Minneapolis after police shot Philando Castile and Thurman Blevins
- Over half of the women answered “yes” when asked “do you feel like this is impacting your current pregnancy”
- Nearly 60% of those women gave birth to preterm babies who were underweight or died
- Operating through a Stress Model

Minnesota Population Center (P2CHD041023)

Dr. Rachel Hardeman (Center Affiliate)

<https://www.npr.org/2020/11/13/933084699/how-police-violence-could-impact-the-health-of-black-infants>





# *Future Research Directions*

# NICHD

- NICHD Strategic Plan:

[https://www.nichd.nih.gov/sites/default/files/2019-09/NICHD Strategic Plan.pdf](https://www.nichd.nih.gov/sites/default/files/2019-09/NICHD_Strategic_Plan.pdf)

- Three recent workshops

- Community Engagement Forum on Improving Maternal Health
- Maternal Mortality in the United States: Future Research Directions
- Pregnancy and Maternal Conditions that Increase Risk of Morbidity and Mortality Workshop



# COVID-19

- Gestational research assessments for covid-19 (GRAVID)
  - Analysis of medical records of up to 24,500 women within NICHD's [Maternal-Fetal Medicine Units Networks](#) to examine maternal and neonatal outcomes for pregnant women with and without SARS-CoV-2 infection
- Global Research Network: COVID19 Infection Prevalence During Pregnancy and Impact on Pregnancy Outcomes
  - Enrollment of 2,000 pregnant women at [8 active international sites](#) to compare the maternal, fetal, and neonatal outcomes of women infected with SARS-CoV-2 to those of non-infected women





# Severe Maternal Morbidity and Maternal Mortality EHR Data Infrastructure

**Develop an HL7® FHIR® Implementation Guide (IG) for research that will focus on longitudinal maternal care and health information and link with infant record(s)**

- ASPE-Patient Centered Outcomes Research Task Force funded project; in collaboration with NIH, CDC, ONC
- Develop an HL7® FHIR® Implementation Guide (IG) for research that includes pregnancy, pregnancy outcomes, and pregnancy-related conditions, comorbidities, and procedures
- Conduct a pilot study to assess the feasibility
- Produce a report that includes the IG and related material





## **IMPROVE: Implementing a Maternal health and PRegnancy Outcomes Vision for Everyone**

- Supported by multiple NIH Institutes and is led by NICHD, the NIH Office of the Director (OD), and ORWH
- Approximately \$7.2 million in grants awarded through a Notice of Special Interest on Maternal Mortality
- Second receipt of applications currently under review
- Areas of research include heart disease, hemorrhage, and infection; contributing conditions, such as obesity, mental health disorders, and substance use disorders; and structural and factors that may contribute to delays or disruptions in maternal care

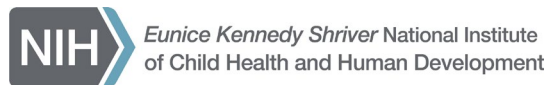


- Recent Awards related to FOA: Addressing Racial Disparities in Maternal Mortality and Morbidity
  - Six institutions
  - Expected to total over \$21 million over five years
- Maternal and Infant Environmental Health Riskscape (MIEHR) Research Center at Baylor Medical College  
P50MD015496
- Maternal And Developmental Risks from Environmental and Social stressors (MADRES) Center for Environmental Health Disparities at University of Southern California P50MD015705



# Thank you

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