



*Women's Health* **2024** | *Beyond the Annual Visit*

*How Primary Care Practitioners  
Can Reduce Maternal Mortality  
and Morbidity in the US*

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# *Conflict of Interest Disclosure*

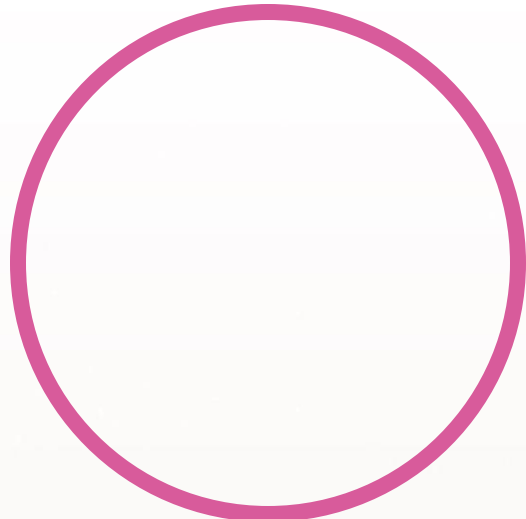
## *Anita L. Nelson, MD*

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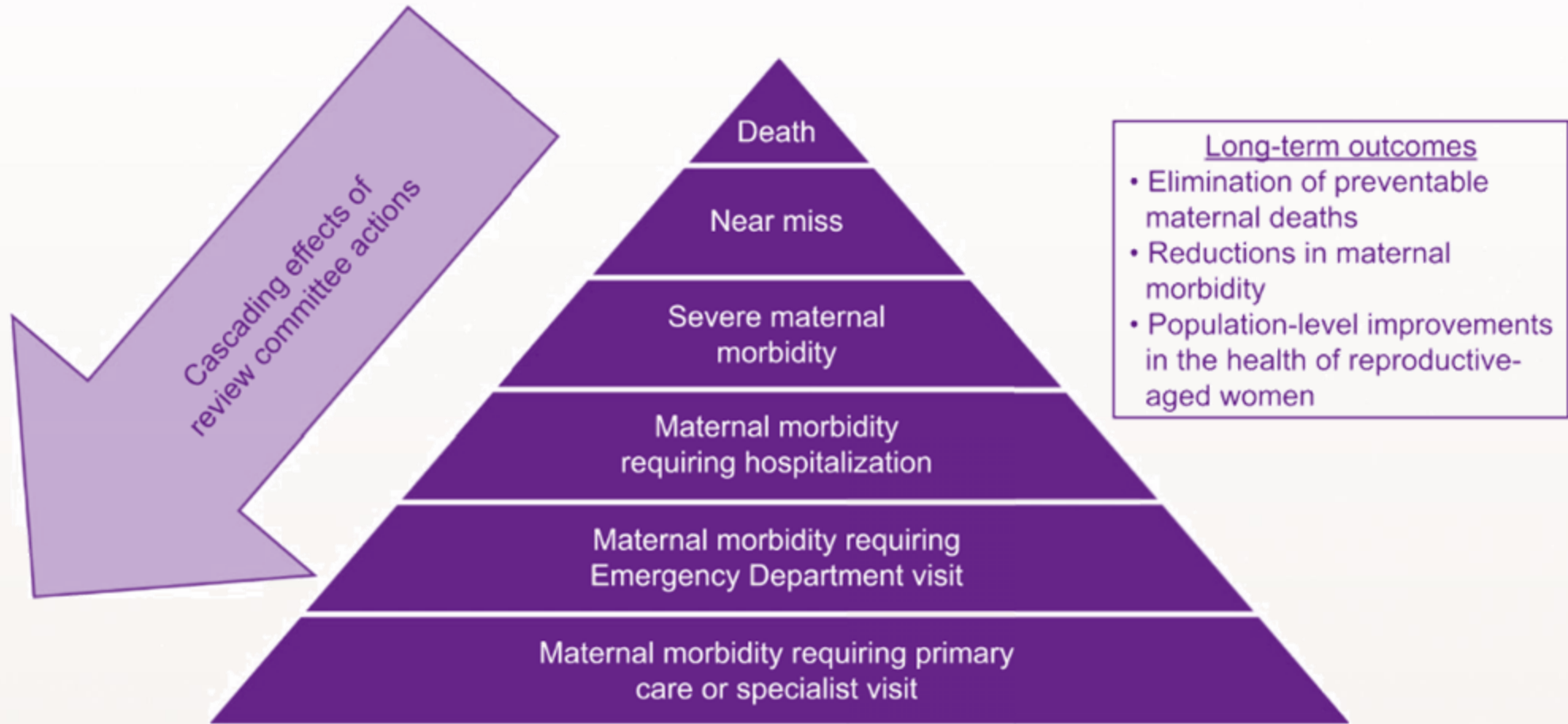


# *Learning Objectives*

***At the conclusion of this presentation, the participant will be able to:***

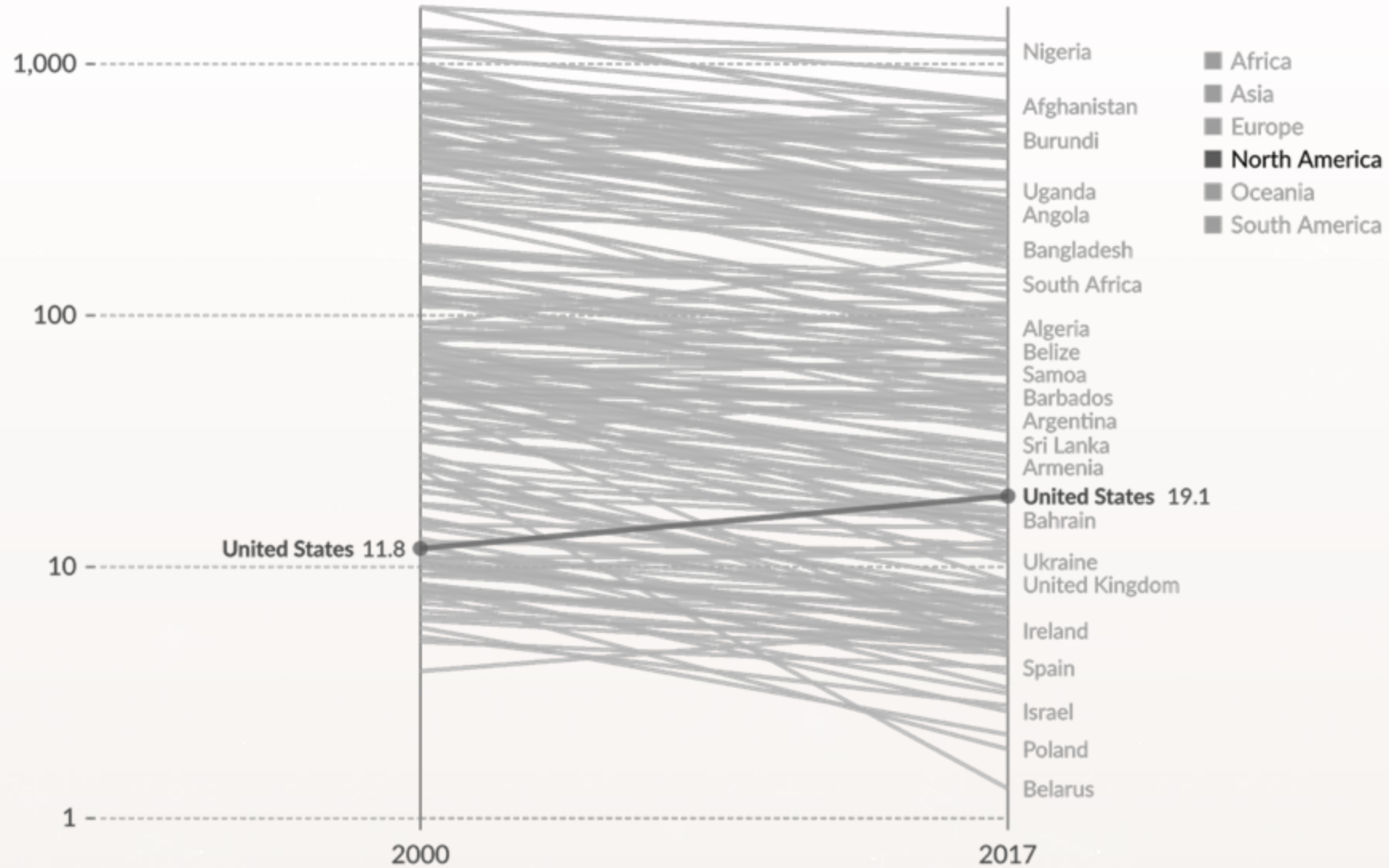
- Describe maternal mortality and morbidity in the United States and differences in different groups
  - Formulate strategies to reduce pregnancy-related cardiovascular risk and hemorrhage
  - List the kind of pre-pregnancy and postpartum care that primary care clinicians can do to reduce the risks of maternal mortality and morbidity
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# Maternal Morbidity/Mortality Terminology



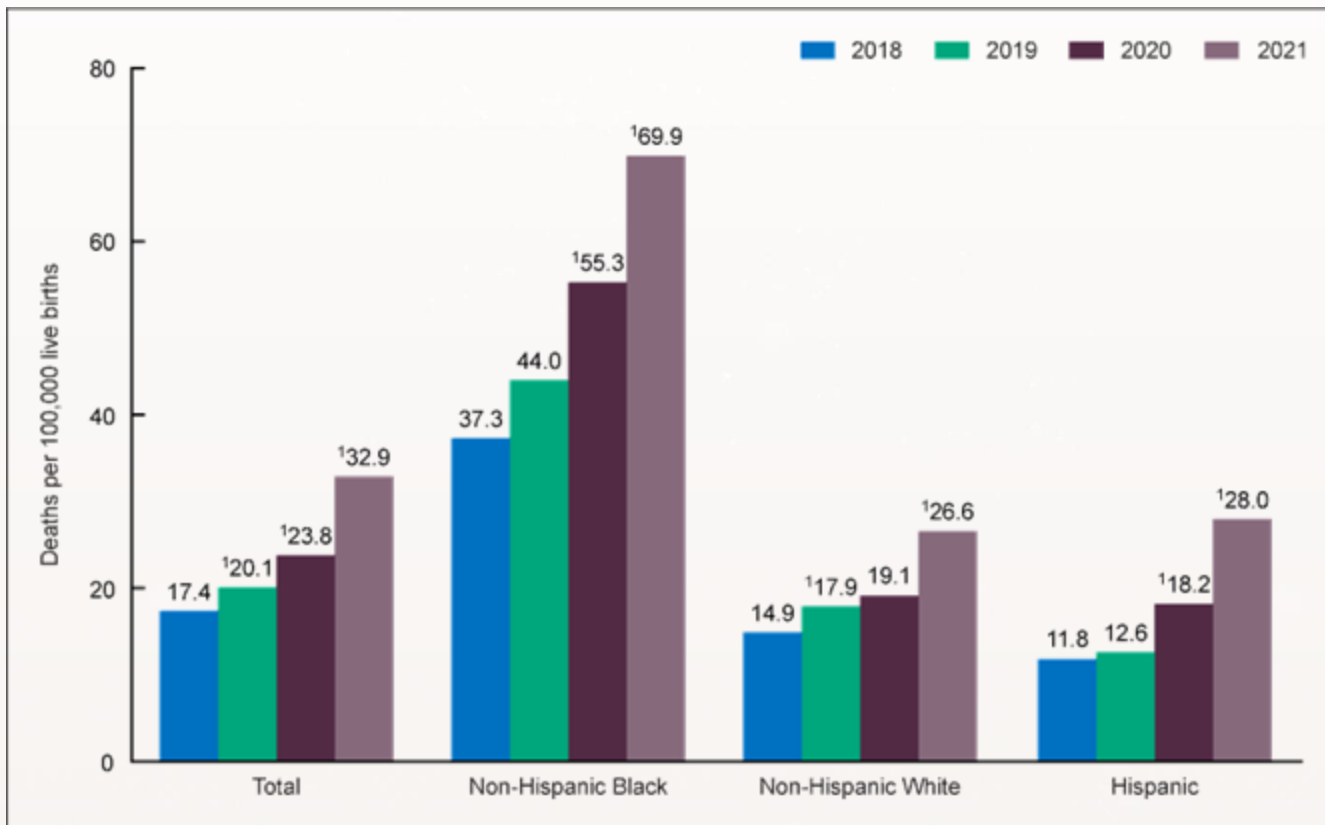


# Worldwide Maternal Mortality



# Maternal Mortality Rates, United States 2018 to 2021

## Maternal Mortality Rates by Race and Hispanic Origin

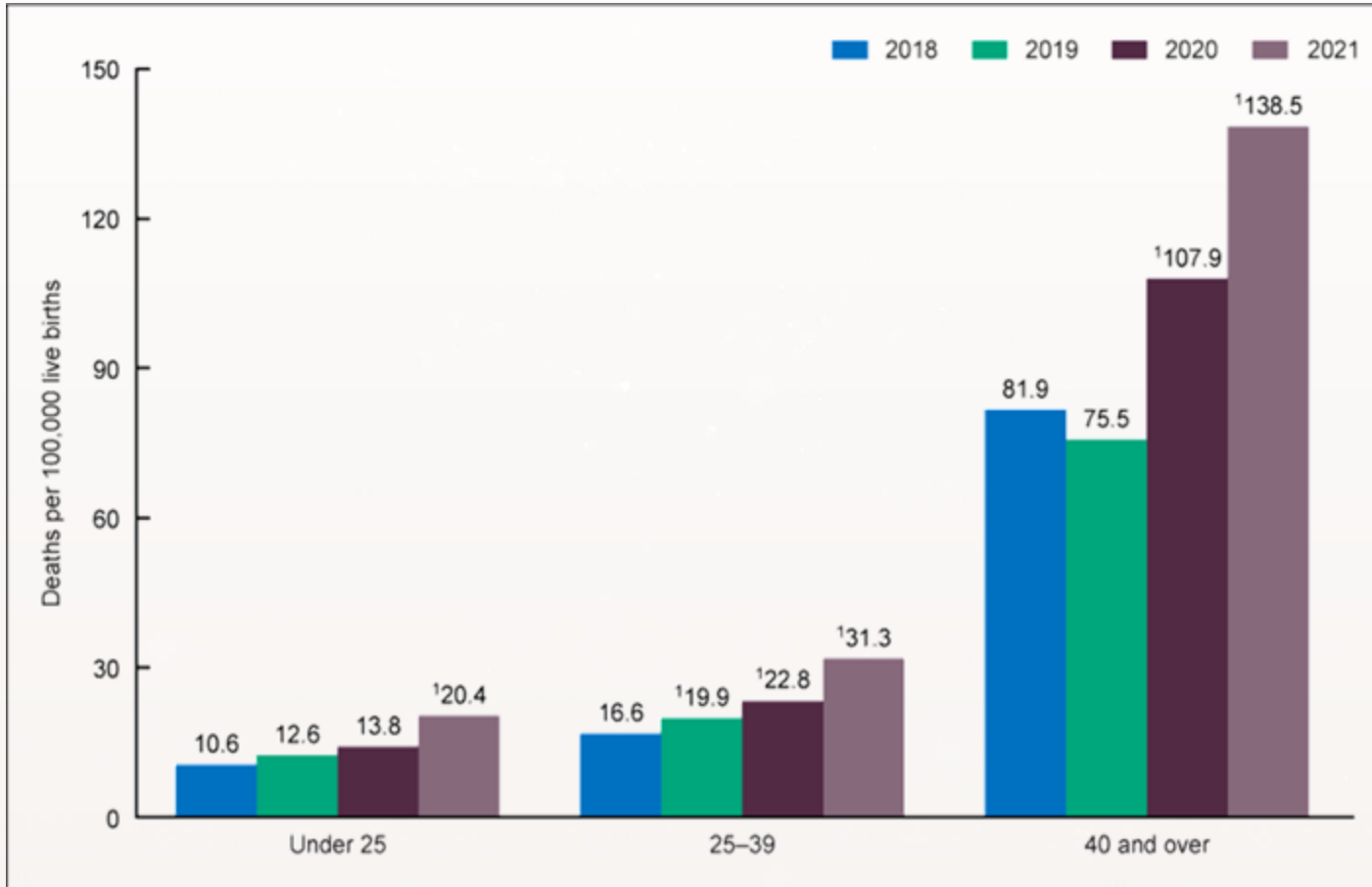


- Maternal mortality rate increasing, highest in United States among all developed countries
- Rates highest in non-Hispanic Black birthing persons
- Rates higher in Hispanic birthing persons compared to non-Hispanic White birthing persons

<sup>1</sup>Statistically significant increase from previous year ( $p < 0.05$ ).  
NOTE: Race groups are single race.

# Maternal Mortality Rates, United States 2018 to 2021

## Maternal Mortality Rates by Age, US 2018 to 2021



- Maternal mortality rates increasing across all age groups
- Maternal mortality rates highest in birthing persons >40 years old

<sup>1</sup>Statistically significant increase from previous year ( $p < 0.05$ ).

# Timing of Pregnancy-Related Deaths

## Pregnancy-Related Deaths by Timing of Death, 36 US States, 2017 to 2019\*

	N	%
During pregnancy	216	21.6
Day of delivery	132	13.2
1–6 days postpartum	120	12.0
7–42 days postpartum	233	23.3
43–365 days postpartum	301	30.0

- 53% of deaths occurred 7 to 365 days postpartum
- Minority of deaths occurred at the time of or within 1 week of delivery



# *CDC Indications for Severe Maternal Morbidity*

- Acute MI, cardiac arrest, A-fib
- Aneurysm
- Acute renal failure
- ARDS, ventilation
- Amniotic fluid embolism
- DIC
- Eclampsia
- Puerperal CVD
- PE, acute heart failure
- Sepsis, shock
- Sickle cell crisis
- Air and thrombotic embolism
- Transfusion
- Hysterectomy
- Temporary tracheostomy

For every woman who dies in childbirth, 70 more come close

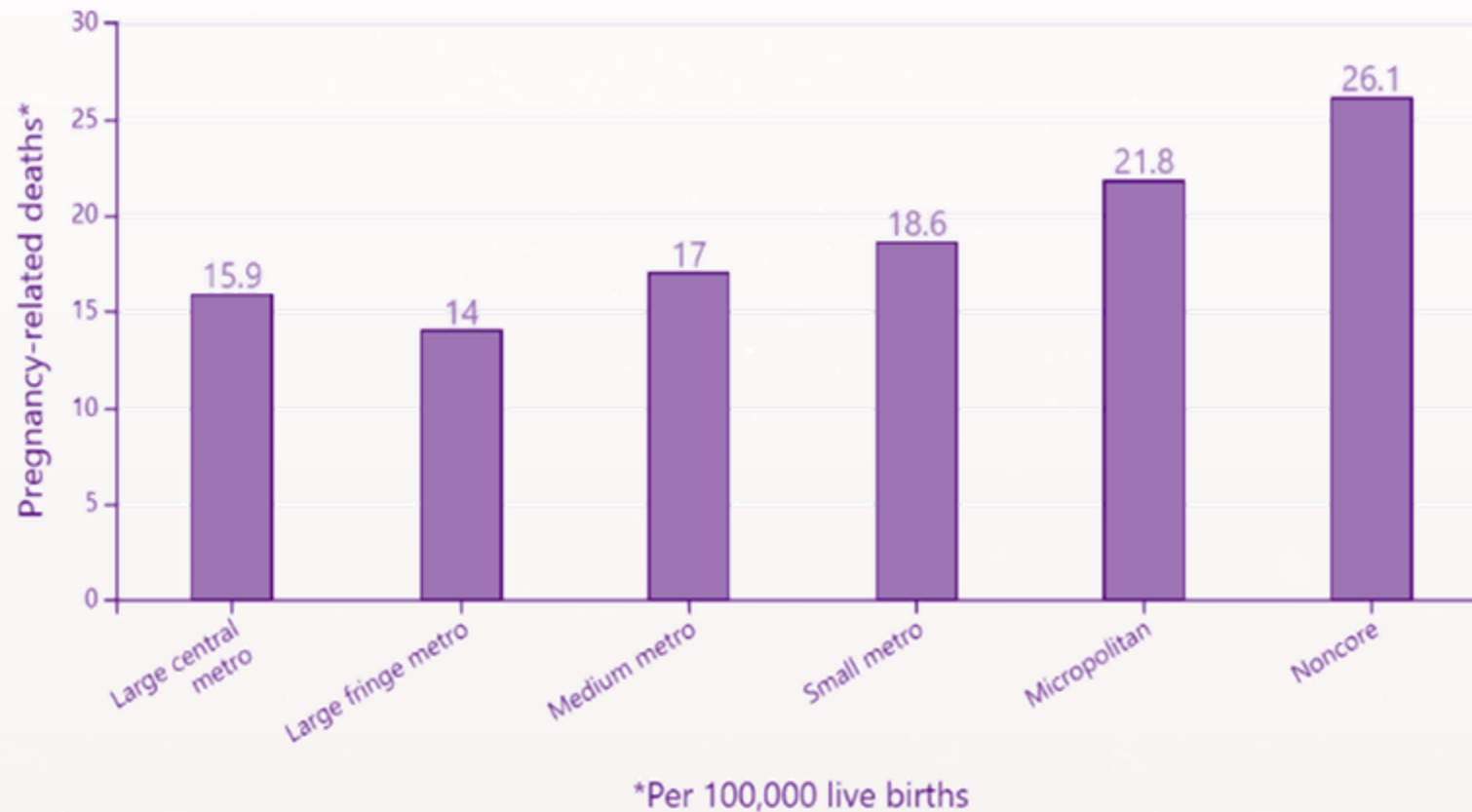


# *Most Frequent Underlying Cause of Pregnancy-Related Deaths*

- Cardiac and coronary conditions
- Thromboembolism
- Cardiomyopathy
- Hemorrhage
- Sepsis
- Mental health conditions
  - Suicide or poisoning related to substance disease

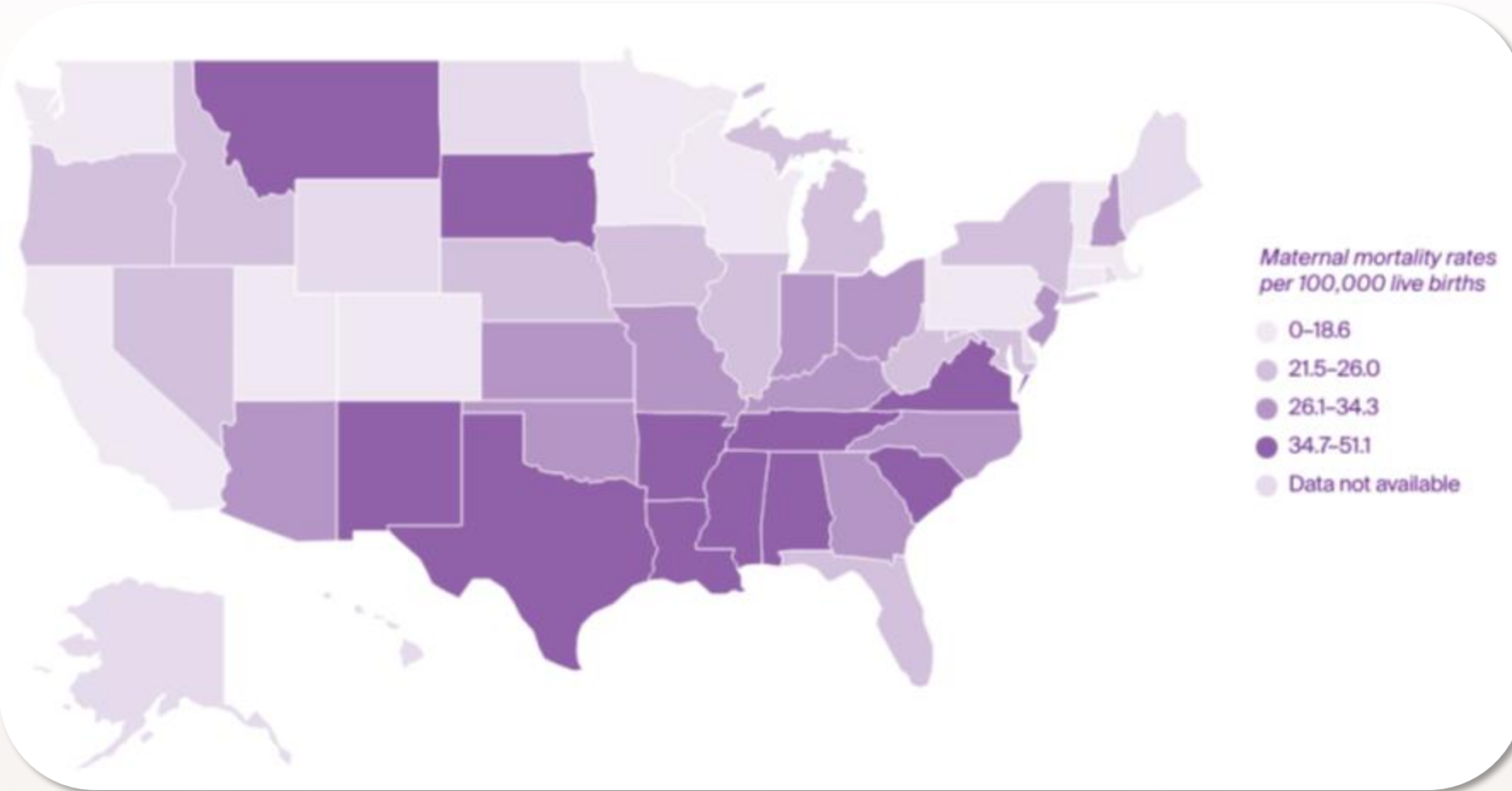
*These account for over 75% of pregnancy-related disease in US*

# Maternal Mortality Ratio, Urban vs Rural



- Maternal mortality rates highest in rural areas
- Nonlinear trend in mortality from most urban to most rural settings

# Maternal Mortality by State





# *Access to Maternity Care Worsening for Millions of US Women*

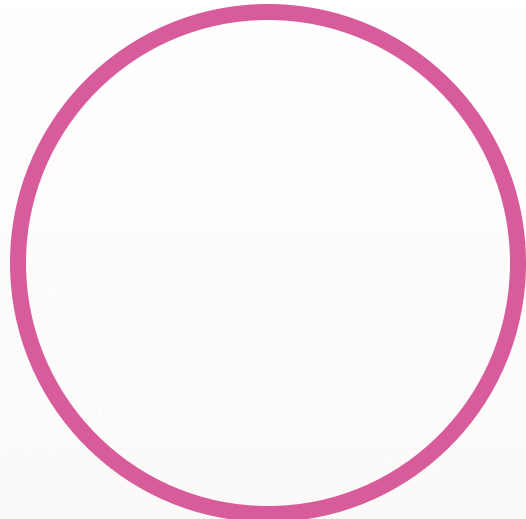


- More than 1/3 (36%) of US counties are considered maternity care deserts; no hospital or birth centers offering obstetrical care and no obstetrician providers
  - 70 counties added since 2018
- 5.6 million women live in counties with no or limited access to maternity care services
- More than 50% of births in maternity deserts are Medicaid reimbursed
- 8 out of 10 maternity care deserts have a high burden of pregnancies with preexisting chronic health conditions
- Increasing home births





# *Overview of Pregnancy Outcomes by Racial/Ethnic Group*

- Rate of pregnancy-related deaths for Black mothers exceeds all other racial and ethnic groups
  - Black mothers at highest risk for
    - Severe maternal morbidity
    - Hypertensive disorders of pregnancy
    - Peripartum cardiomyopathy
    - Preterm birth
    - Postpartum readmissions
  - Black babies – low birth weight, prenatal death, and infant mortality
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# *The Story Behind the Numbers*

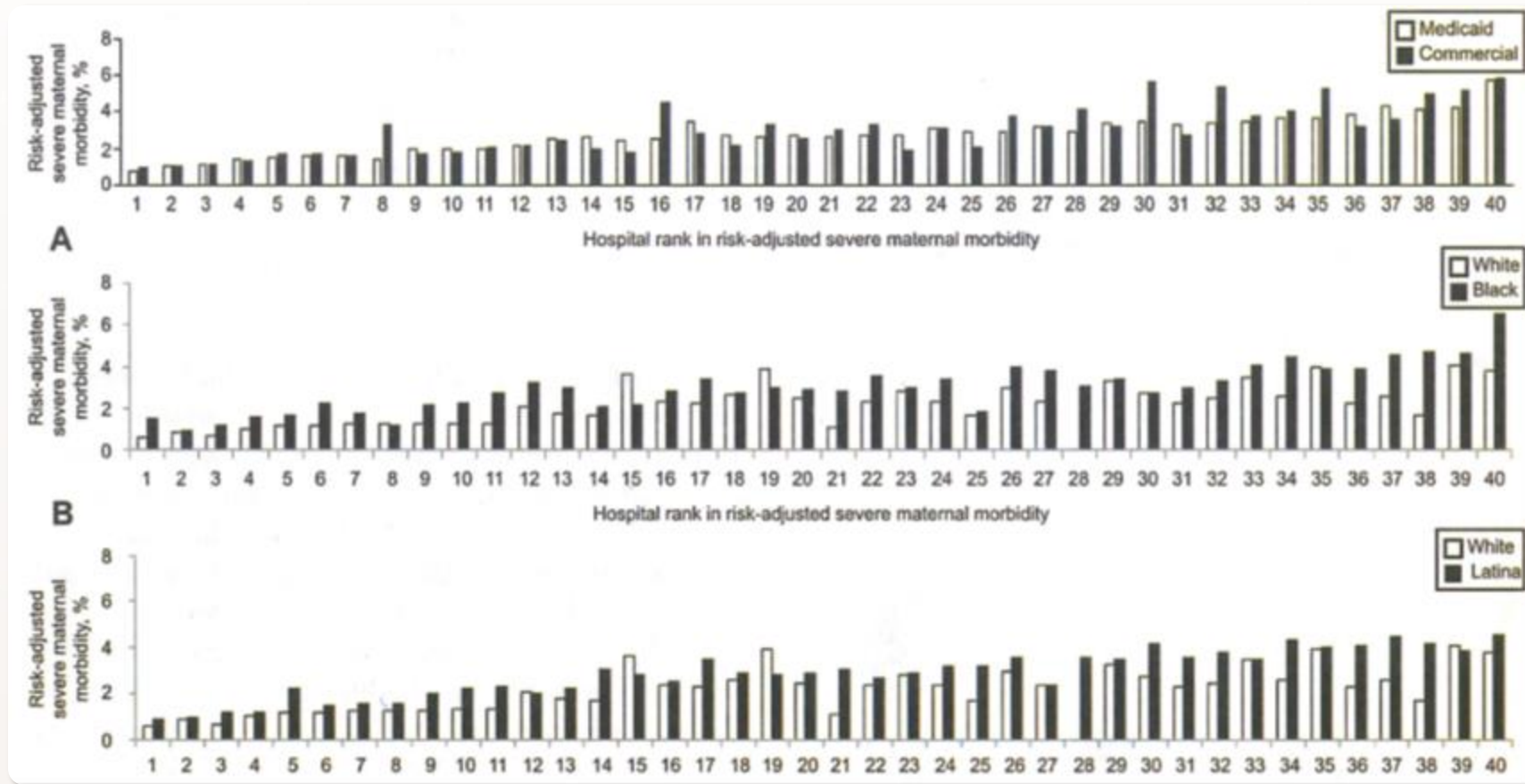
- Increase in maternal mortality ratios: 1999-2014<sup>1</sup>
  - Mainly due to increases in maternal deaths and mortality ratios associated with 2 new ICD-10 codes (renal disease and other maternal disease)
  - Represents correction of prior underrepresentation
- Proportion of pregnancy-related maternal deaths in medical facilities is decreasing, but overall ratios are increasing<sup>2</sup>
  - Highlights importance of death occurring outside of medical facilities as key contributor to maternal mortality
- Black women had highest mortality rates consistently but rate of increase greatest in White women

# Within-Hospital Comparison: Risk-Adjusted Severe Maternal Morbidity for 591,455 Deliveries

Medicaid-insured compared with commercially insured patients

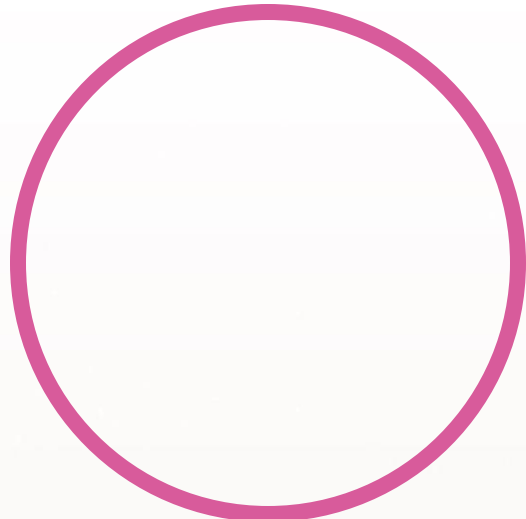
Black compared with White patients

Latina compared with White patients





# *Ways Gendered Racism Manifested for Pregnant Black Women*

- **Everyday contexts:** This showed up in the form of stereotypes stigmatizing Black motherhood that devalued Black pregnancies in everyday contexts. This included assumptions that they had low incomes, were single mothers, and had multiple children, regardless of the reality. This racism made it difficult to do routine tasks like going to the grocery store without scrutiny.
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# *Black Women's Stories*

- Serena Williams' complaints of repeat PE ignored
- Timoria McQueen Saba almost died from postpartum hemorrhage
  - One MD did not tell her she had a placenta previa
  - Long wait times, degrading questions, "Is your husband your baby's father?"
  - Her care "improved a billion percent" when her White husband came with her to appointments<sup>1</sup>
- Alisha Liggett, MD: "The day I was reduced to a Black birthing body"<sup>2</sup>

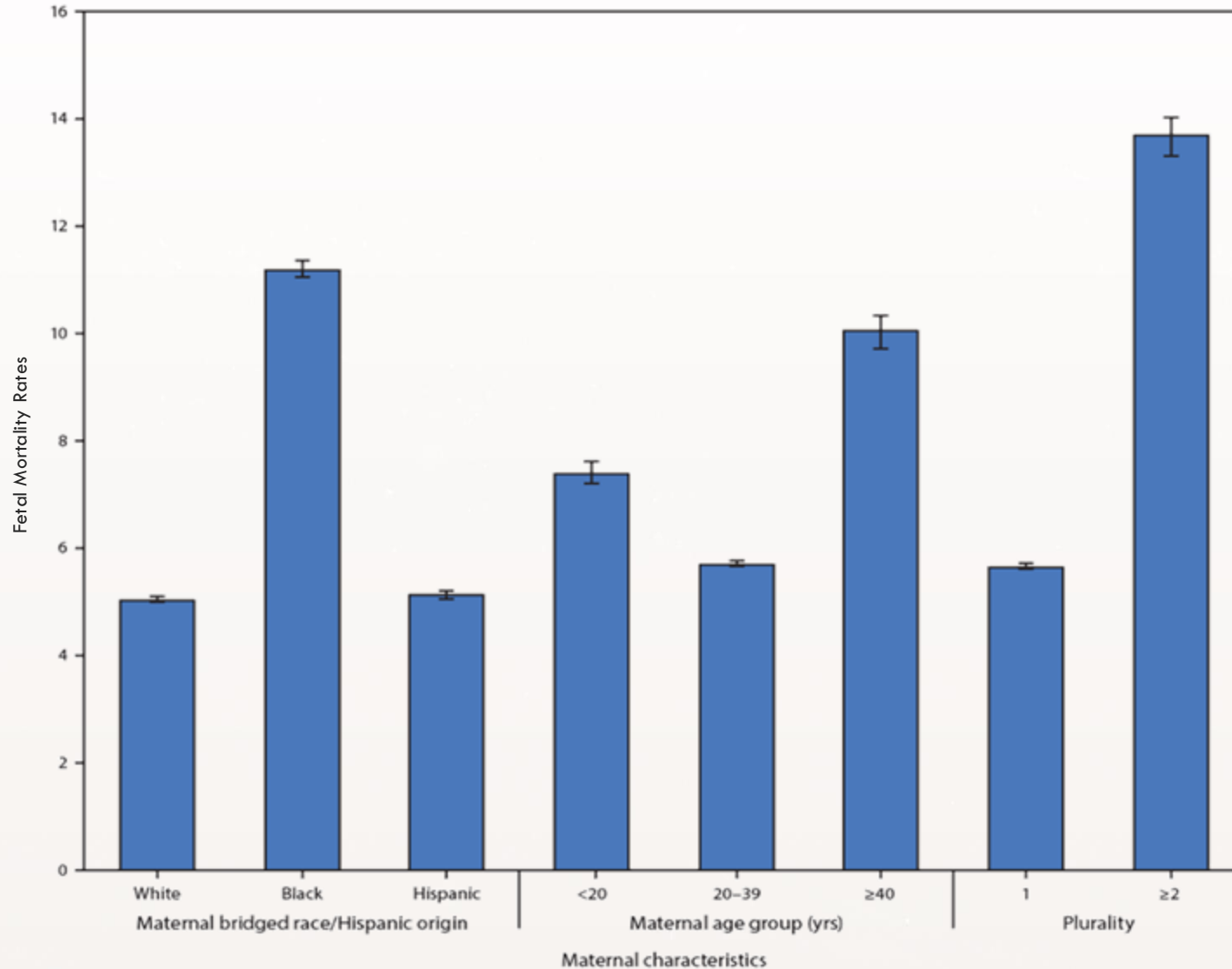
1. Worcester S. May 5, 2020.

<https://www.mdedge.com/obgyn/article/221705/obstetrics/american-maternal-mortality-crisis-role-racism-and-bias>

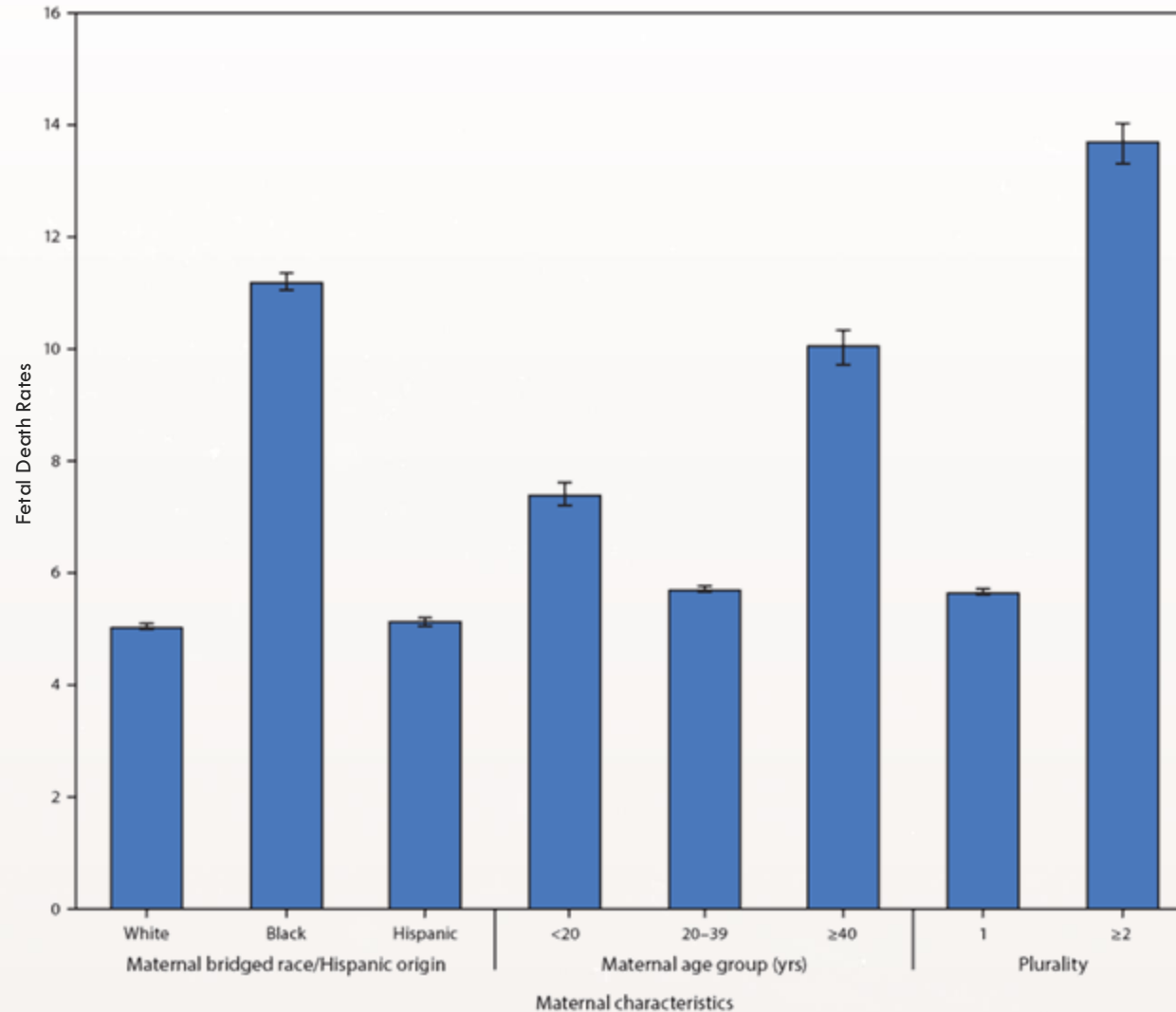
2. Liggett A. October 8, 2020. <https://www.kuow.org/stories/the-day-i-was-reduced-to-a-black-birthing-body-a-doctor-reflects-on-pregnancy>



# Fetal Mortality Rates: United States 2015-2017




# *Fetal Mortality Rates, by Selected Maternal Characteristics: United States, 2015-2017*






# *Challenges to Optimal Obstetrical Outcomes*

- Pregnancy planning not standard
  - Preconception care rarely provided
    - Pregnancies may be “wanted” or “planned” but rarely are “prepared for”
  - Rapid advancements in prenatal care
    - Cell-free fetal DNA, detailed ultrasound studies
  - Growing obstetrical deserts throughout the country
  - Growing fear/suspicion of hospital delivery
  - Costs of care can bankrupt family
  - Overrepresentation of poor outcomes among underserved groups
  - Lack of standardization of care - allows bias
  - Lack of long-term follow-up of problems revealed during pregnancy
- 



# *Preconception Care*

- Most often in purview of primary care clinicians
    - Encourage pregnancy planning, effective birth control
    - May need to consult with MFM for high-risk problems or to REI for IVF
  - Vast array of behavioral, social and environmental factors, and medical conditions influence reproductive health outcomes and need to be covered
  - CDC says that all providers who care for pregnancy-capable people should be able to provide preconception care
- 



# *CDC Vision for Improving Preconception Health and Pregnancy Outcomes*



- All women of childbearing age and men of reproductive age have high reproductive awareness
- All women and men have a reproductive life plan
- All pregnancies are intended and planned
- All women of childbearing age have health coverage
- All women of childbearing age are screened prior to pregnancy for risks related to pregnancy outcomes
- Women with a prior adverse pregnancy outcome have access to intensive inter-conception care to reduce those risks



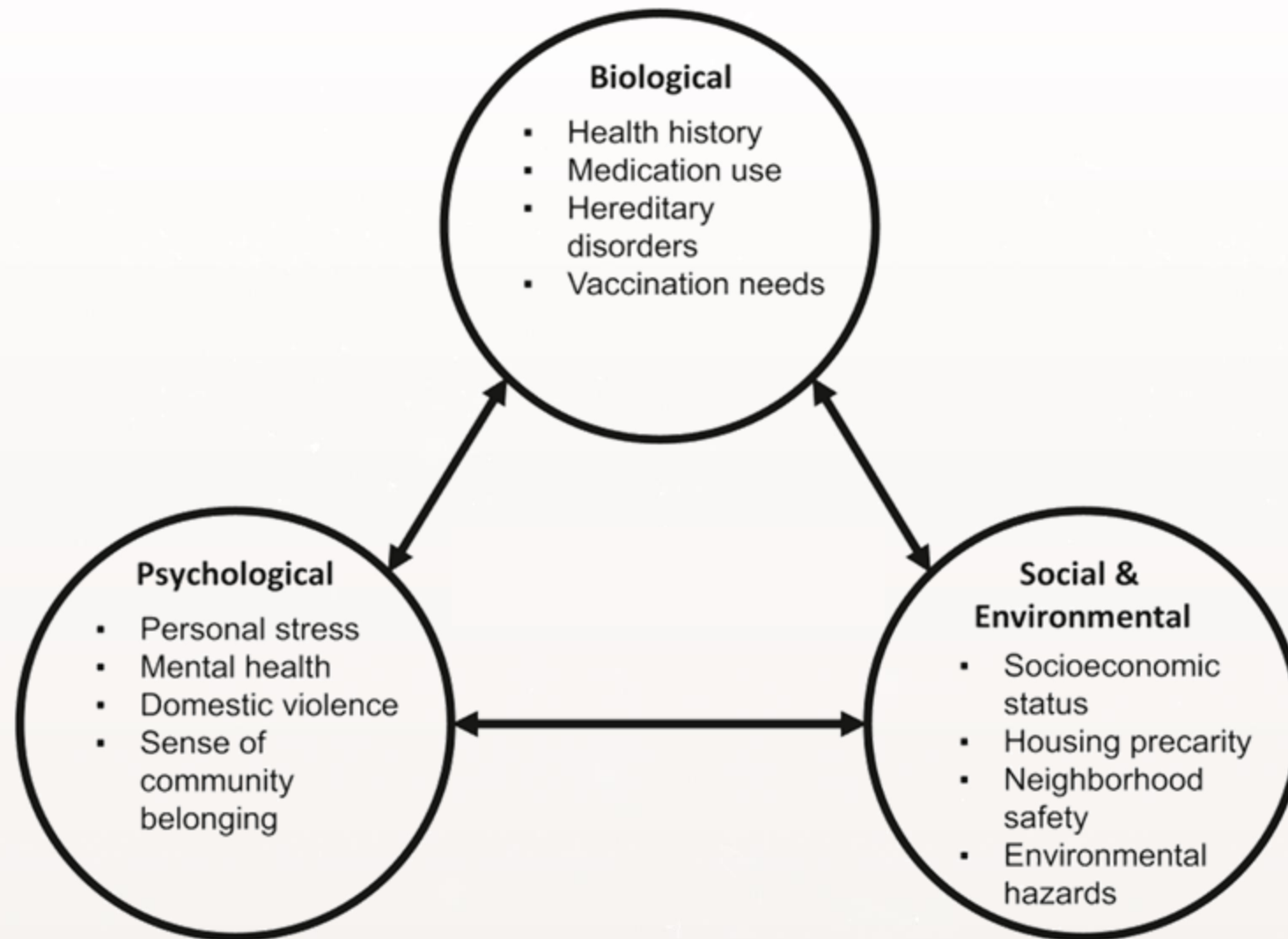


## *Folic Acid to Reduce Risk of Neural Tube Defects: 1-3 Months Before Conception + First 28 Days*

- Low-risk women
  - 0.4-0.8 mg folate daily - usually prenatal vitamins
- High-risk women
  - 1 mg folate daily
  - Twins, diabetes (DM), seizure disorders
- Previous neural tube defect (NTD) affected infant
  - 4 mg daily



# Preconception Health for Best Outcomes



# Elements of Preconception Counseling and Care

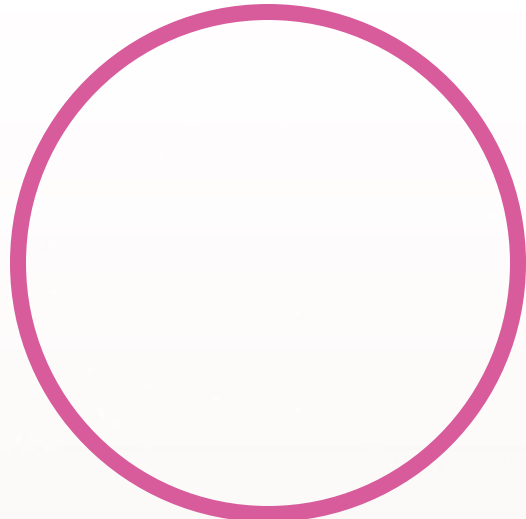
Major Components of Preconception Care	Risk Assessment
<b>Reproductive life plan</b>	Ask your patient if she plans to have any (more) children and how long she plans to wait until she (next) becomes pregnant. Help her develop a plan to achieve those goals.
<b>Past reproductive history</b>	Review prior adverse pregnancy outcomes, such as fetal loss, birth defects, low birth weight, and preterm birth, and assess ongoing biobehavioral risks that could lead to recurrence in a subsequent pregnancy.
<b>Past medical history</b>	Ask about past medical history, such as rheumatic heart disease, thromboembolism, or autoimmune diseases, that could affect future pregnancy. Screen for ongoing chronic conditions such as hypertension and diabetes.
<b>Medications</b>	Review current medication use. Avoid category X drugs and most category D drugs unless potential maternal benefits outweigh fetal risks. Review use of over-the-counter medications, herbs, and supplements.
<b>Infections and immunizations</b>	Screen for periodontal, urogenital, and sexually transmitted infections as indicated. Discuss TORCH (toxoplasmosis, other, rubella, cytomegalovirus, herpes simplex virus), varicella, Tdap (combined tetanus, diphtheria, and pertussis), human papillomavirus, and influenza vaccines as needed.

# Elements of Preconception Counseling and Care

Major Components of Preconception Care	Risk Assessment
<b>Genetic screening and family history</b>	Assess risk of chromosomal or genetic disorders based on family history, ethnic background, and age. Offer cystic fibrosis screening. Discuss management of known genetic disorders (eg, phenylketonuria, thrombophilia) before and during pregnancy.
<b>Nutritional assessment</b>	Assess anthropometric (body mass index), biochemical (eg, anemia), clinical, and dietary risks.
<b>Substance abuse</b>	Ask about smoking, alcohol, drug use. Use T-ACE (tolerance, annoyed, cut down, eye opener) or CAGE (cut-down, annoyed, guilty, eye-opener) questions to screen for alcohol and substance abuse.
<b>Toxins and teratogens</b>	Review exposures at home, neighborhood, and work. Review Material Safety Data Sheet and consult local Teratogen Information Service as needed.
<b>Psychosocial concerns</b>	Screen for depression, anxiety, intimate partner violence, and major psychosocial stressors.
<b>Physical examination</b>	Focus on periodontal, thyroid, heart, breasts, and pelvic examination.
<b>Laboratory tests</b>	Check complete blood count, urinalysis, blood type and antibody screen, rubella, syphilis, hepatitis B, HIV, cervical cytology; screen for gonorrhea, chlamydia, and diabetes in selected populations. Consider thyroid-stimulating hormone.



# *Women With Chronic Medical Conditions: Principles*

- Counseling should provide information about:
    - Risk of pregnancy complications
    - Maternal mortality and morbidity
    - Disease prognosis without pregnancy
    - Potential conflicts between maternal treatment and fetal well-being
    - Risks to fetus of condition and treatments used
    - Optimal timing of pregnancy
  - Integrated services
- 



# *Alcohol Use*

- Prenatal alcohol use: leading preventable cause of birth defects and developmental disabilities (FASD)
    - 0.5-2 cases/1,000 live births
    - Lifetime cost - \$2 million/case
  - 11.8% pregnant women reported currently used
    - 2.9% binged (>5 drinks on occasion)
  - Women with unprotected intercourse
    - >50% used; 1/8 binged
  - No safe level of alcohol in pregnancy
- 



# *Impact of Preconception Glucose Control*

- 421 insulin-dependent women with type 1 diabetes

<b>Malformation Rate</b>	
Nondiabetic women	1.4%
Strict control after 8 weeks	7.5%
Strict control prior to conception	0.8%

- Desired control fasting glucose <100; 2H postprandial <120

# *Periconception Glycemic Control and Congenital Anomalies in Women With Diabetes*

- Glucose is a teratogen
- Recent study of 351 women; preconceptional diabetes (65% type 2)
  - 52 (14.3%) babies with congenital anomaly
  - 43 had a major anomaly; 51.1% cardiovascular

<b>HbA1c</b>	<b>Anomaly Rate</b>	<b>aOR</b>
<7.4	10.2%	
7.5-9.4	20.6%	2.35
9.5-11.4	25.8%	2.36
>11.5	37.5%	7.66



# *Changing and Individuating the Content of Prenatal Care and Delivery*



- New care delivery approaches<sup>1</sup>
  - Individualize care based on needs
  - Group sessions with other patients
  - Telehealth sessions
  - Team of providers, social and medical needs
  - Connected care (blend)
- Standardized protocols for management of hemorrhage, preeclampsia, etc.<sup>2</sup>

# *Cardiovascular Disease Impacts*

- Cardiovascular disease (CVD) = heart disease and stroke
- CVD is leading cause of maternal mortality<sup>1</sup>
- Prevalence of obesity, hypertension, and diabetes has increased
  - Prevalence of CVD in young adults
- Pregnancy places substantial physiologic stress on cardiovascular system<sup>2</sup>
  - Can lead to ischemic placental disease that foreshadows future CVD<sup>2</sup>
- First 3 months after delivery are vulnerable period for increased CVD risks<sup>2</sup>
  - Most CVD deaths occur in postpartum period<sup>2</sup>
- But 11.5% lose insurance after delivery<sup>2</sup>
- 40% don't return for postpartum visit; approx. 60% of attendees get CVD counseling<sup>3</sup>

# *Hypertensive Disorders of Pregnancy (HDP)*

- Risk factors: age >35, Black race, preconceptional or gestational diabetes
- Outcomes differ: >50% of births to women with chronic HTN with superimposed preeclampsia were SGA or preterm; also had highest rates of C-section
- Women with HDP: >50% Increased risk of hospital encounter in 12 weeks postpartum
- 40% of maternal deaths occur in postpartum transition
  - 60% preventable



# *Birth Trauma: Beyond Mortality and Morbidity*


- Birth trauma is defined by patient
- Experiences increase risk of PTSD, future fertility
- Common themes:
  - Loss of control
  - Physical and emotional trauma







# *Maternity Care Experiences United States 2023*

- 
- 1/5 mothers report mistreatment during maternity care – with violation of physical privacy, verbal abuse
    - 30% of Black, Hispanic, and multiracial mothers
    - 30% of publicly insured or with no insurance
  - 40% of Black, Hispanic, and multiracial mothers reported discrimination during maternity care
  - 45% of all mothers reported holding back from asking questions or discussing concerns with their providers

# *Comprehensive Postpartum Care*

- Full assessment of physical, social, and psychological well-being
  - Mood and emotional well-being
  - Infant care and feeding
  - Sexuality, contraception, and birth spacing
  - Sleep and fatigue
  - Physical recovery from birth
  - Chronic disease management
  - Health maintenance
- Special attention for long-term care for red flag conditions: HTN disorders, obesity, diabetes, thyroid disorders, renal disease, and mood disorders



# *Intermediate-Term Outcomes*



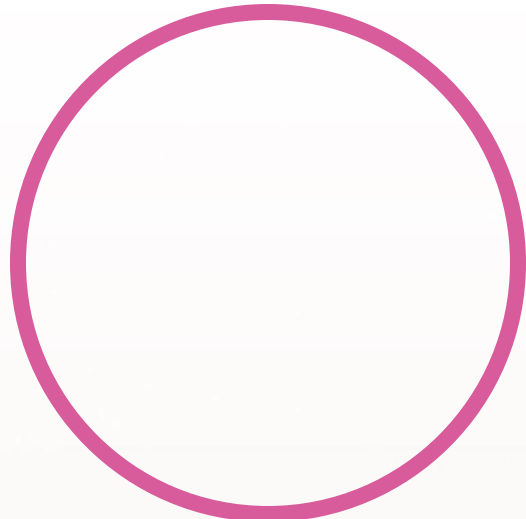
- Gestational diabetes has a very high risk for progression
  - Within 12 months postpartum for those who screened normal immediately postpartum
    - 14.5% overt diabetes
    - 38.5% prediabetes
    - Up to 25% had metabolic syndrome
- Hypertensive disorders of pregnancy have 2 times higher risk of ischemic heart disease and stroke, heart failure, CKD, and vascular dementia within 10 years

# *Perinatal Depression (PND)*

- Maternal suicide is second most common cause of death during postnatal period<sup>1</sup>
  - 13%-36% of deaths attributable to suicide
- 86,551 patients with PND followed for a median of 6.9 years<sup>2</sup>
  - 3,604 events of suicidal behavior occurred; 5.62/1,000 patients/year
  - Compared to unaffected maternal controls HR = 3.5
  - Highest risk of postnatal depression occurred among those with prior history or psychiatric disorders
  - Risk of suicide behavior highest in first year following PND diagnosis but remained elevated for 5-18 years
  - Vigilant clinical monitoring needed



# *Addressing Racism, Bias in American Maternal Mortality Crisis*

- Open access to health insurance and healthcare
  - Extending maternity coverage to 1 year postpartum
  - Increased use of telemedicine
    - Home BP monitoring postpartum
  - Improved data collection processes and quality measures to understand factors
  - Investment in social determinants of health
  - Grow and diversify perinatal workforce
    - Doulas, midwives
- 



# *Concluding Remarks*

- Maternal morbidity and mortality is on the rise in the United States with large disparities among race, SES, and urban vs rural status
  - Need input from multiple levels to combat this epidemic
  - Checklists, simulations, multidisciplinary programs, and telemedicine/remote care technology can reduce maternal morbidity and mortality
  - Systems and providers need to recognize and combat inequities in care to decrease differences in mortality among birthing persons of color
  - Prepare women for pregnancy and follow them longer after delivery
    - Pregnancy is not a 9-month event; we need to do more before and after
- 