



Advancing NIH Research on the Health of Women: A 2021 Conference

The US Maternal Healthcare Crisis

Elizabeth Howell MD, MPP
Harrison McCrea Dickson President's Distinguished Professor
Chair, Department of Obstetrics & Gynecology
Perelman School of Medicine
University of Pennsylvania Health System

Presenter Disclosures

Elizabeth Howell, MD, MPP

I have no personal financial relationships with commercial interests relevant to this presentation

Acknowledgement

- Our discussion today has implications for Black, Brown, and Indigenous Birthing People
- I refer to “women” to describe pregnant individuals. However, I recognize that people of various gender identities, including transgender, nonbinary, and cisgender individuals, give birth and receive maternity care
- There is a long legacy of racism and discrimination that has been experienced by Black women and most of the research to date has been on cisgender women
- We have much work to do to expand our definitions and collect meaningful data on all birthing people

Maternal Healthcare Crisis

**Hospitals know how
to protect mothers.
They just aren't
doing it.**

Alison Young, USA TODAY
4:54 p.m. EDT July 27, 2018

Opinion

If Americans Love Moms, Why Do We Let Them Die?



By [Nicholas Kristof](#)

July 29, 2017



New York Times

We finally have a new US maternal mortality estimate. It's still terrible.

Among 10 similarly wealthy countries, “the US would rank 10th.”

By Julia Belluz | @juliaoftoronto | julia.belluz@voxmedia.com | Jan 30, 2020, 10:40am EST



According to a **report** out Thursday from the Centers for Disease Control and Prevention’s **National Vital Statistics System**, the 2018 maternal mortality rate was 17.4 maternal deaths per 100,000 live births — meaning 658 women died in 2018. The figure includes deaths during pregnancy, at birth, or within 42 days of birth.

US rate = 17.4

The rate once again put the US last among similarly wealthy countries, according to **Eugene Declercq**, a professor of community health sciences at Boston University School of Public Health. If you compare the CDC figure to other countries in the World Health Organization’s latest maternal mortality ranking, the US would rank 55th, just behind Russia (17 per 100,000) and just ahead of Ukraine (19 per 100,000). And “If you limit the comparison to those similarly wealthy countries,” such as Germany, “the US would rank 10th — out of 10 countries.”

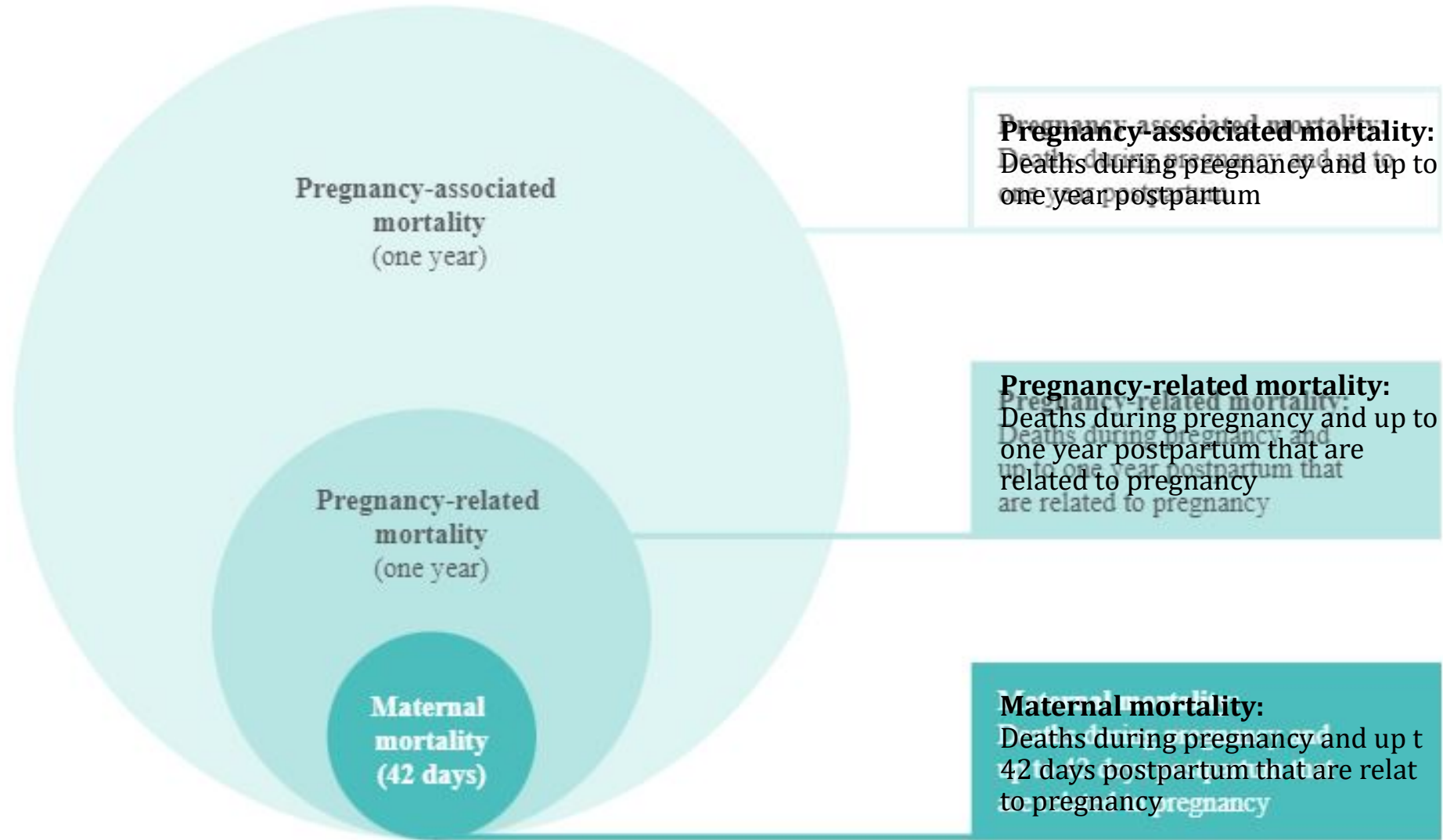
Ranked 55th

“No matter how one analyzes the data, we still lag well behind other countries,” he added.

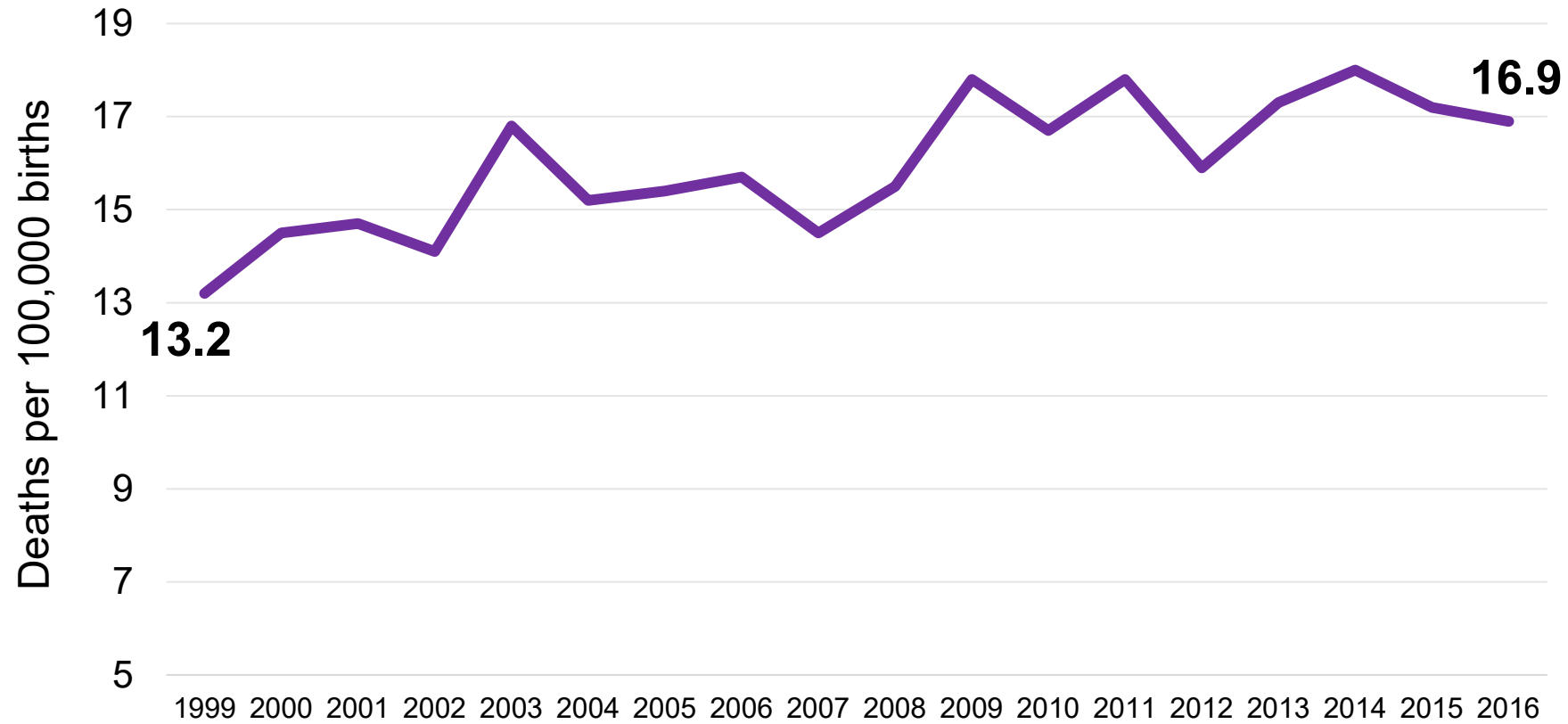
<https://www.cdc.gov/nchs/maternal-mortality/index.htm>

<https://www.vox.com/2020/1/30/21113782/pregnancy-deaths-us-maternal-mortality-rateb>

What do we mean by maternal mortality?

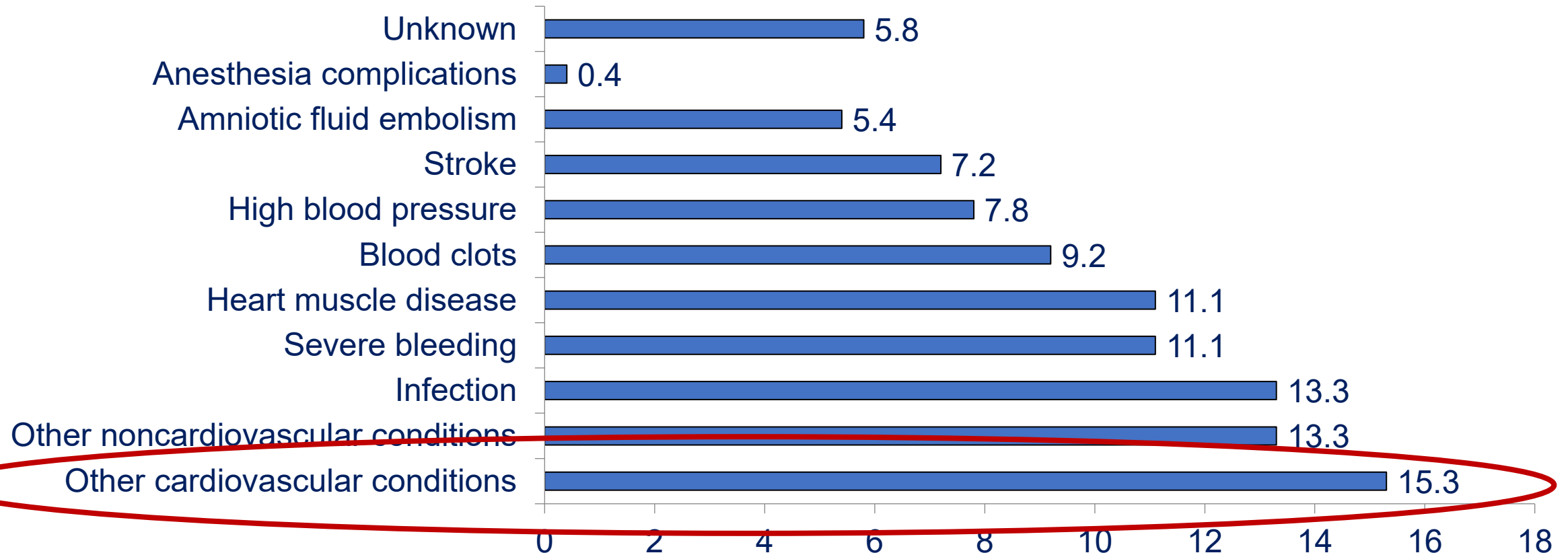


Pregnancy-Related Mortality, PMSS, 1999-2016



Petersen EE, Davis NL, Goodman D, et al. Racial/Ethnic Disparities in Pregnancy-Related Deaths — United States, 2007–2016. *MMWR Morb Mortal Wkly Rep* 2019;68:762–765, Attribution: Emily Petersen

Leading Clinical Causes of Pregnancy-related Mortality, US, 2007-2016



Data: Emily E. Petersen et al., Racial/Ethnic Disparities in Pregnancy-Related Deaths – United States, 2007-20016. *Morbidity and Mortality Weekly Report* 68, no. 35 (Sept. 6, 2019): 762–65.; Eugene Declercq and Laurie Zephyrin, *Maternal Mortality in the United States: A Primer* (Commonwealth Fund, Dec. 2020). <https://doi.org/10.26099/ta1q-mw24>

Maternal Self-Harm Deaths

Suicide Is a Leading Cause of Death Among New Moms

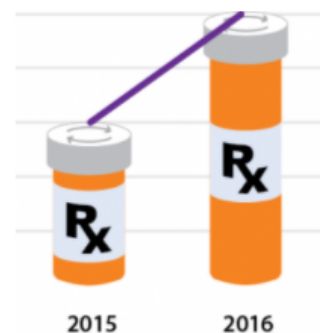
Maternal deaths by suicide are an unrecognized — and preventable — public health issue. Why isn't anyone talking about it?

By Cassie Shortsleeve | Updated May 01, 2020 @ 10:00 am

The US Opioid Crisis: Addressing Maternal and Infant Health

CDC

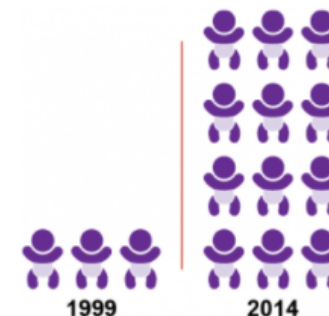
The Toll



The rate of overdose deaths among women



Opioid use disorder has gone up more than 4 times among pregnant women.



4 times as many infants were born with neonatal abstinence syndrome (NAS) in 2014 than in 1999.

Maternal Self-Harm Deaths

- Under reported
- Many suicide deaths, pregnancy status unknown
- Peak incidence between 9 and 12 months postpartum
- Risk factors: major depression, substance use disorder, intimate partner violence
- Common themes among deaths related to mental health causes
 - Inadequate assessment of risk
 - Failure to screen
 - Ineffective treatment
 - Delay in diagnosis, treatment, follow up
 - Lack of coordinated care, lack of communication

Grigoriadis S. Can Med Assoc J 2017;189:E1085-92; Mangla K. Amer J Obstet & Gynecol. 2019;221(4):295-303; Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018). Report from nine maternal mortality review committees. Retrieved from http://reviewtoaction.org/Report_from_Nine_MMRCs

Nothing Protects Black Women From Dying in Pregnancy and Childbirth

Not education. Not income. Not even being an expert on racial disparities in health care.

by **Nina Martin**, ProPublica, and **Renee Montagne**, NPR, Dec. 7, 2017, 8 a.m. EST

PROPUBLICA TOPICS ▾ SERIES ▾ ABOUT

LOST MOTHERS

dis

How Hospitals Are Failing Black Mothers

A ProPublica analysis shows that women who deliver at hospitals that disproportionately serve black mothers are at a higher risk of harm.

by **Annie Waldman**, Dec. 27, 2017, 8 a.m. EST

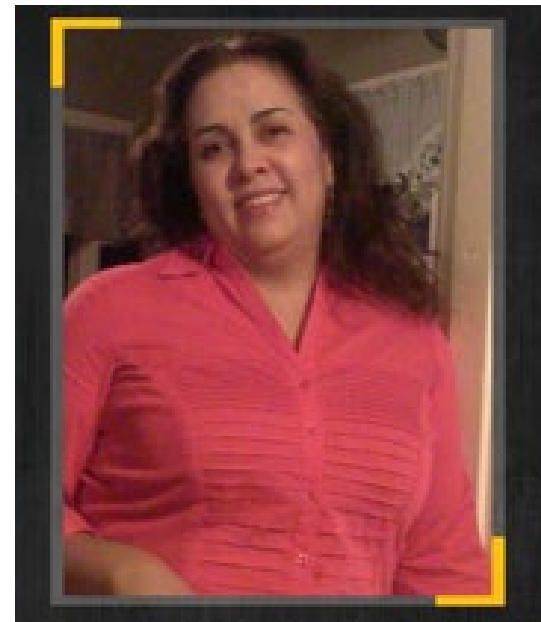
The Extraordinary Danger of Being Pregnant and Uninsured in Texas

Over three years, nearly 400 pregnant or new mothers died in Texas. Its system for helping the uninsured thwarts women at every turn, frustrates doctors and midwives, and incentivizes substandard care.

by **Nina Martin**, ProPublica, and **Julia Belluz**, Vox, Dec. 6, 2019, 5 a.m. EST

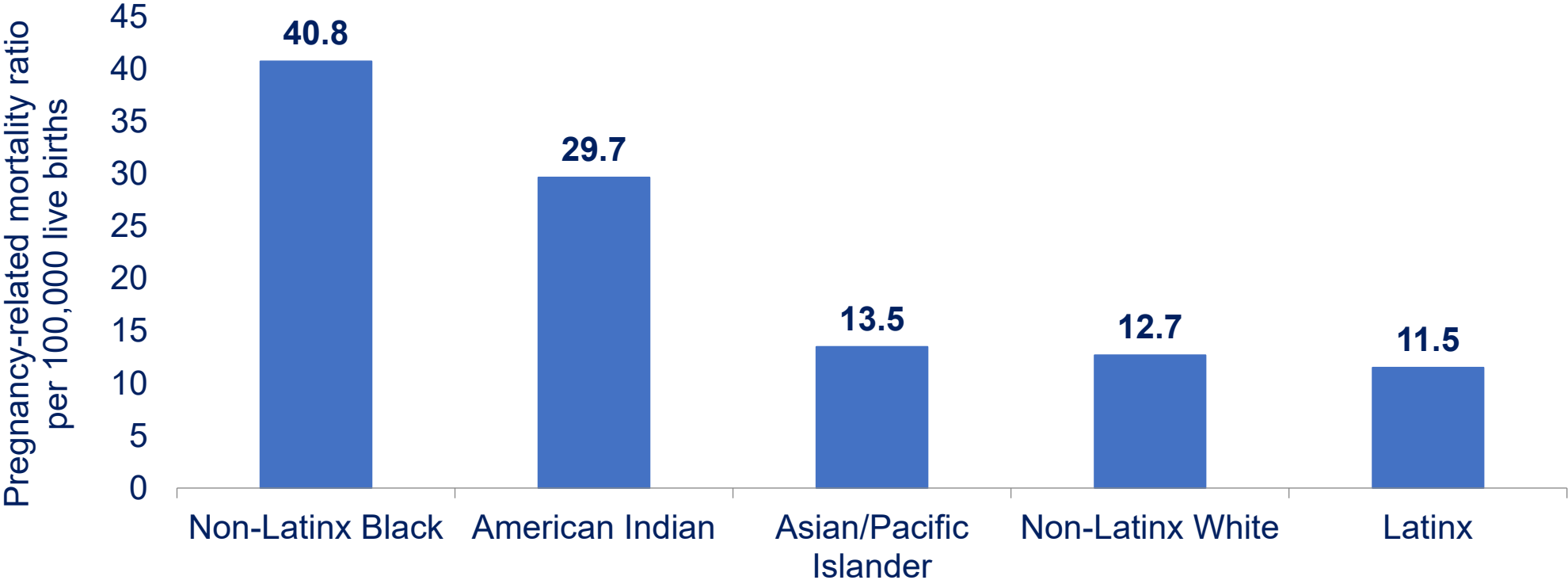


Dr. Shalon Irving



Rosa Diaz

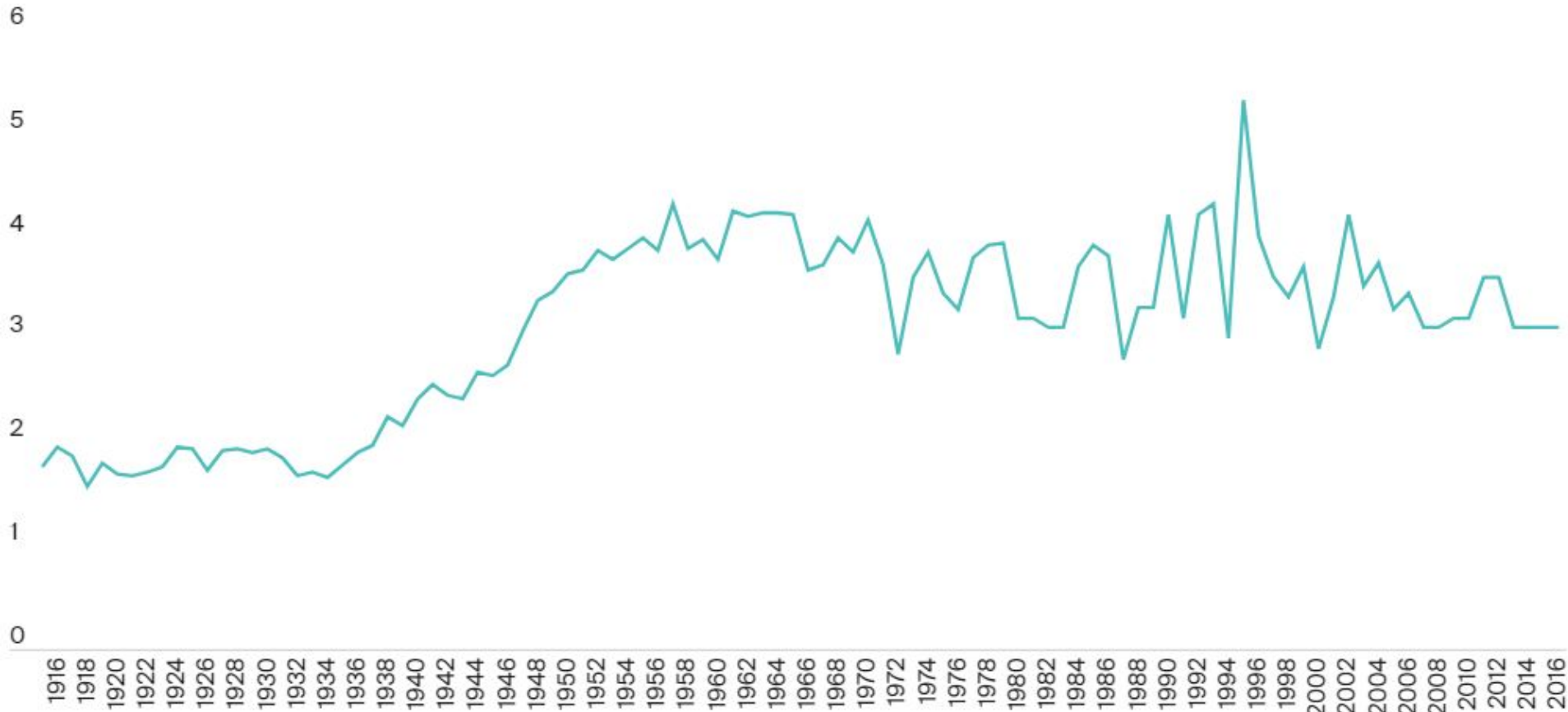
Pregnancy-Related Mortality Ratios by Race-Ethnicity, 2007-2016



Petersen E et al. Racial/Ethnic Disparities in Pregnancy-Related Deaths – United States, 2007-2016. MMWR. Sept. 6, 2019. vol 68. no 35; New York City DOHMH. Pregnancy-Associated Mortality in NYC, 2011-2015. Long Island City, New York. Feb. 2020

Black-White Maternal Mortality Gap

Black mothers have been more likely to die than white mothers for 100 years.

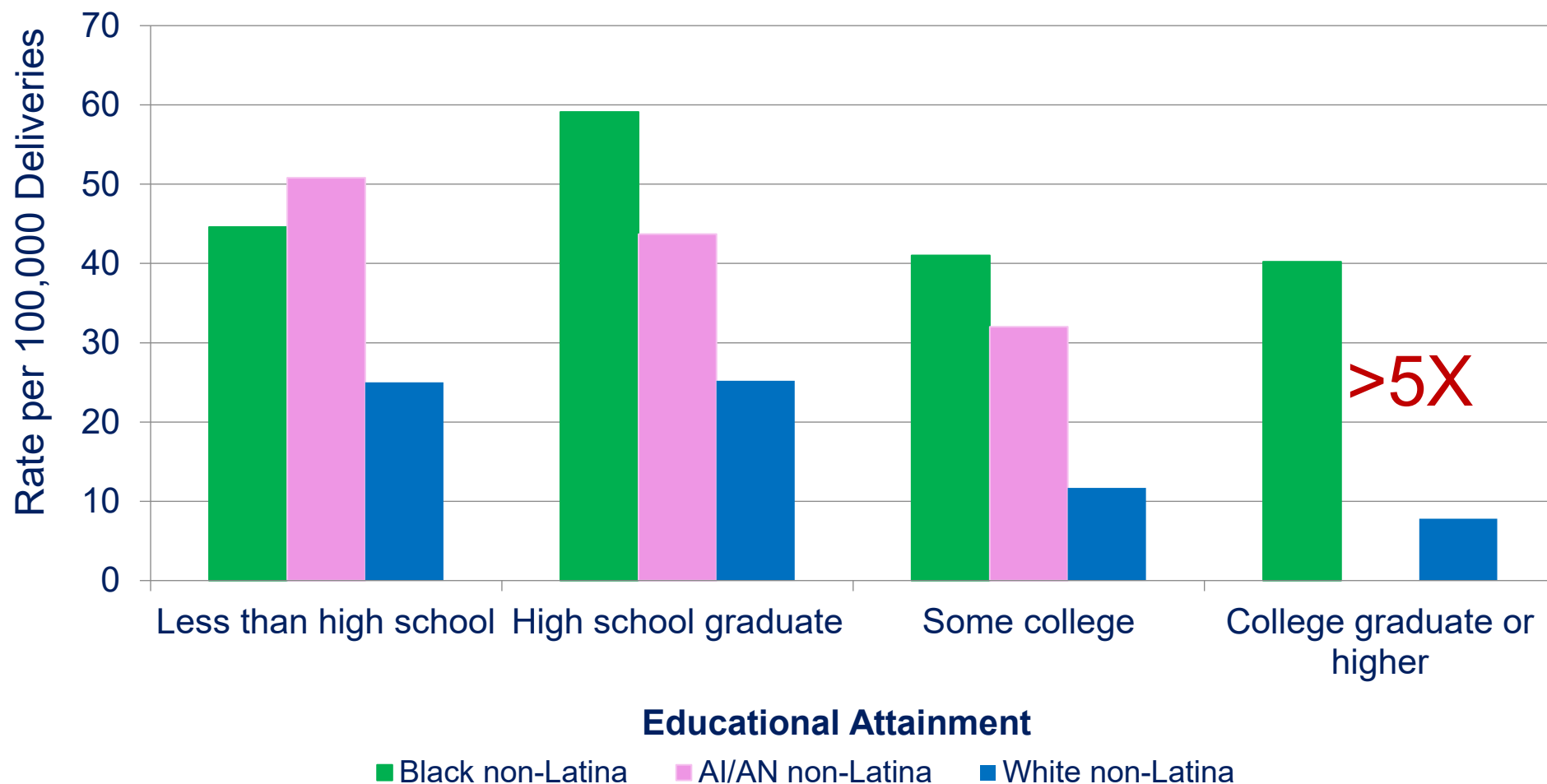


Eugene Declercq and Laurie Zephyrin, Maternal Mortality in the United States: A Primer (Commonwealth Fund, Dec. 2020).
<https://doi.org/10.26099/ta1q-mw24>

Definition of Disparities

- “Health equity and health disparities are intertwined. Health equity means social justice in health (i.e., no one is denied the possibility to be healthy for belonging to a group that has historically been economically/ socially disadvantaged). Health disparities are the metric we use to measure progress toward achieving health equity.”
(Dr. Paula Braveman)

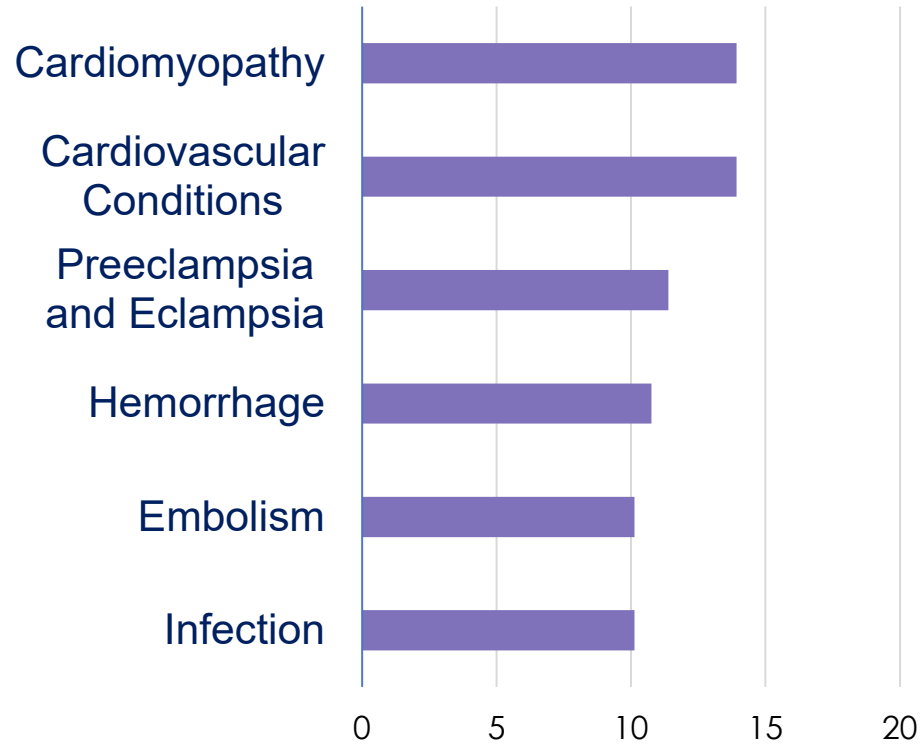
Pregnancy-Related Mortality Ratios by Educational Attainment, 2006-2017



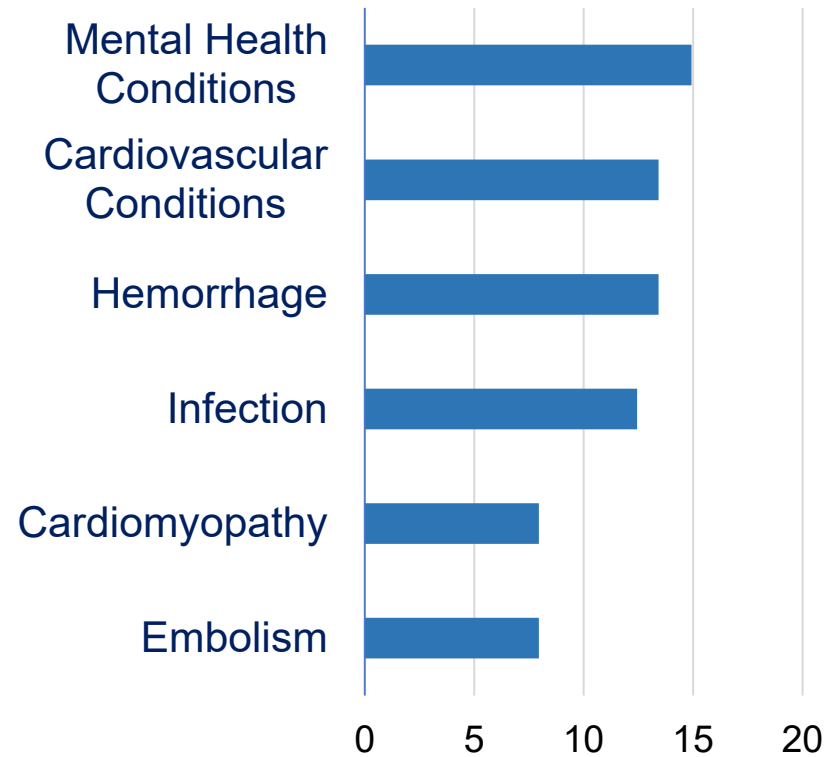
Source: Petersen E et al. Racial/Ethnic Disparities in Pregnancy-Related Deaths – United States, 2007-2016. MMWR. Sept. 6, 2019. vol 68. no 35

Leading Underlying Causes of Pregnancy-Related Deaths by Race/Ethnicity

Non-Hispanic Black



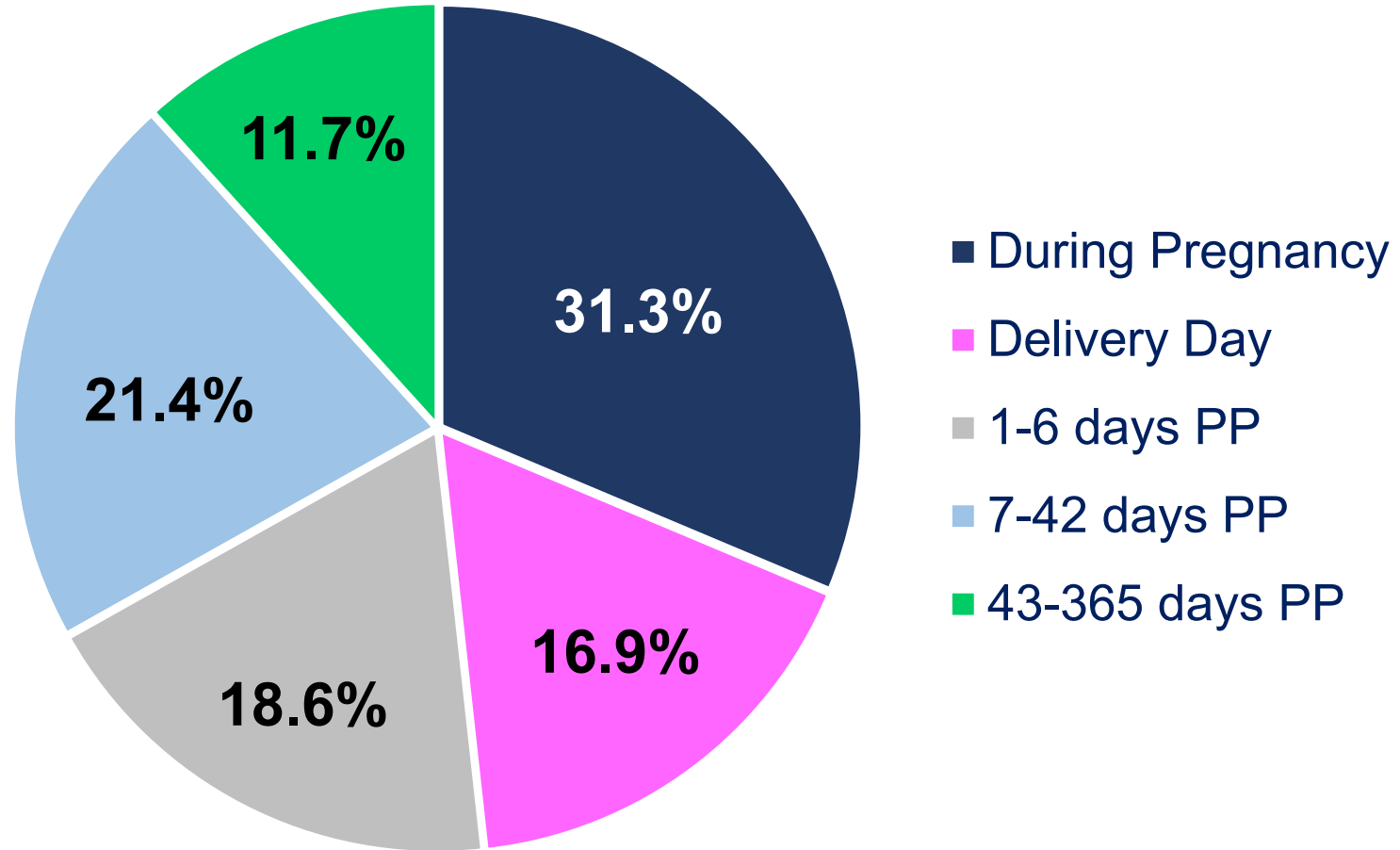
Non-Hispanic White



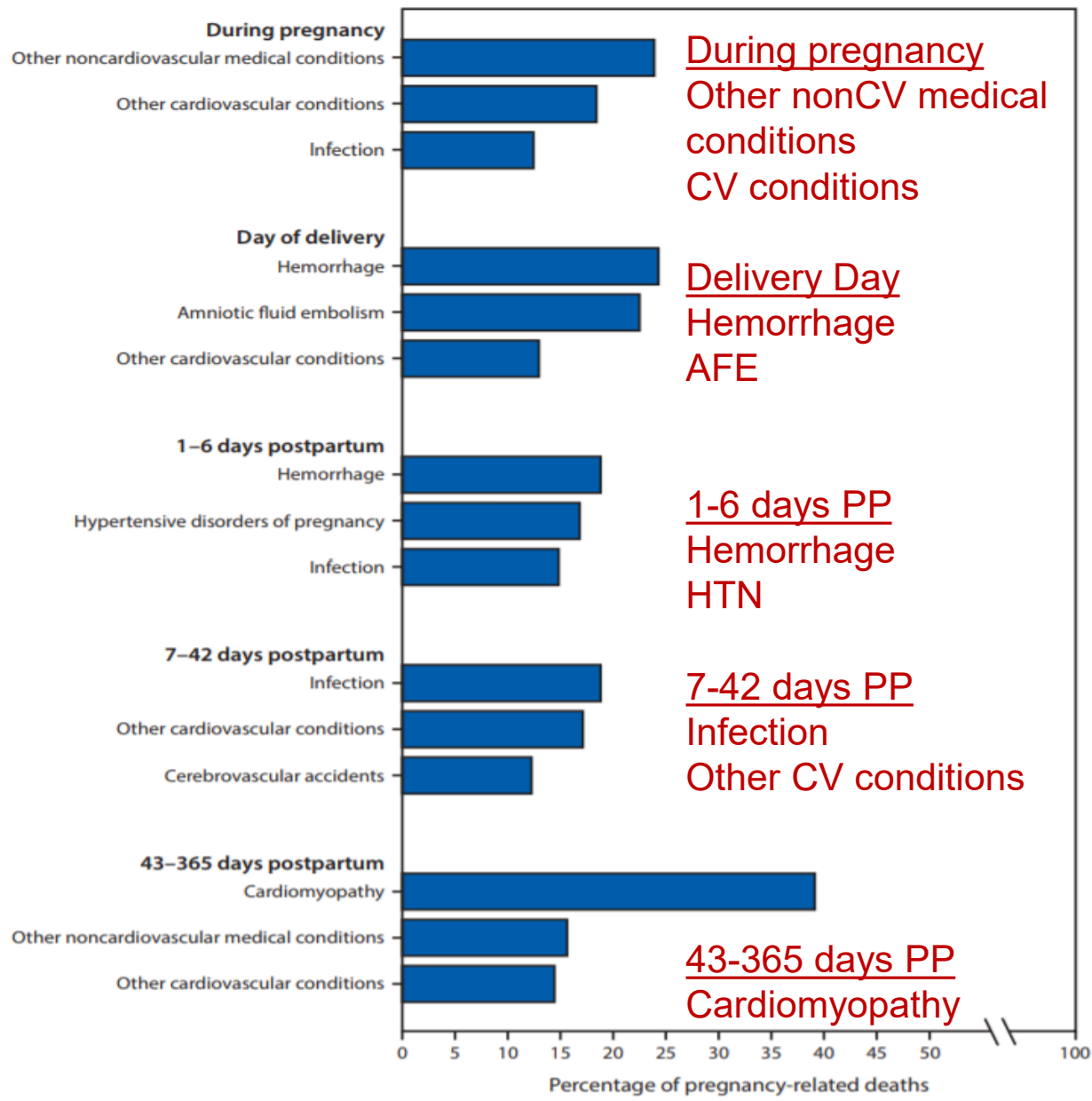
Davis NL, Smoots AN, Goodman DA. Pregnancy-Related Deaths: Data from 14 U.S. Maternal Mortality Review Committees, 2008-2017. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2019

Timing of Pregnancy-Related Death

>50% of maternal deaths occur postpartum



Vital Signs: Pregnancy-Related Deaths, United States, 2011–2015, and Strategies for Prevention, 13 States, 2013–2017.
MMWR Morb Mortal Wkly Rep 2019;68:423–429



During pregnancy
 Other nonCV medical conditions
 CV conditions

Delivery Day
 Hemorrhage
 AFE

1-6 days PP
 Hemorrhage
 HTN

7-42 days PP
 Infection
 Other CV conditions

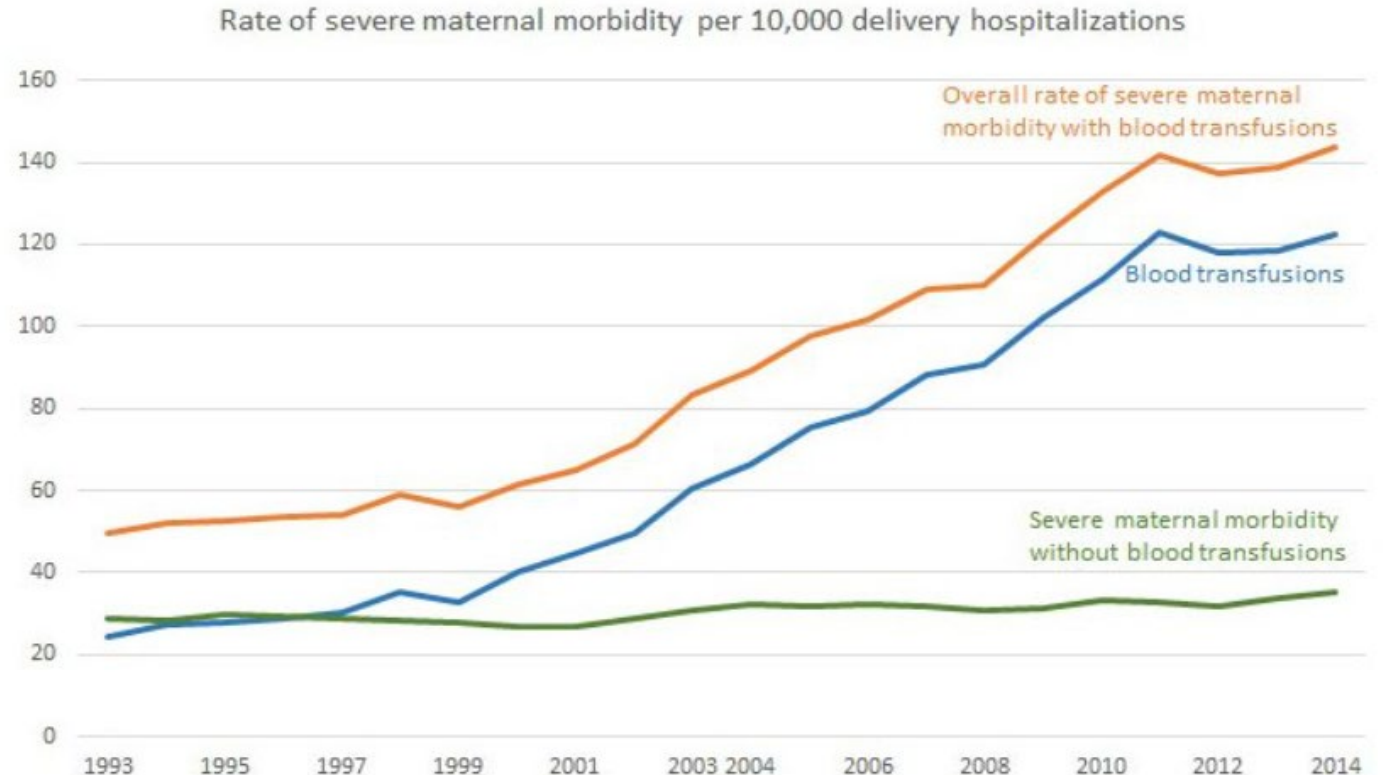
43-365 days PP
 Cardiomyopathy

Vital Signs: Pregnancy-Related Deaths, United States, 2011–2015, and Strategies for Prevention, 13 States, 2013–2017. MMWR Morb Mortal Wkly Rep 2019;68:423–429.

Pregnancy-related Death is the Tip of the Iceberg

- For every maternal death, 100 women experience severe maternal morbidity
- Life-threatening diagnosis or life-saving procedure
 - organ failure (e.g. renal, liver), shock, amniotic embolism, eclampsia, septicemia, cardiac events
 - ventilation, transfusion, hysterectomy
- Rates are increasing

Severe Maternal Morbidity, 1993–2014



Callaghan. Obstet Gynecol 2012;120:1029-36; Severe Maternal Morbidity in the United States
<https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html>

Racial / Ethnic Disparities in Severe Maternal Morbidity

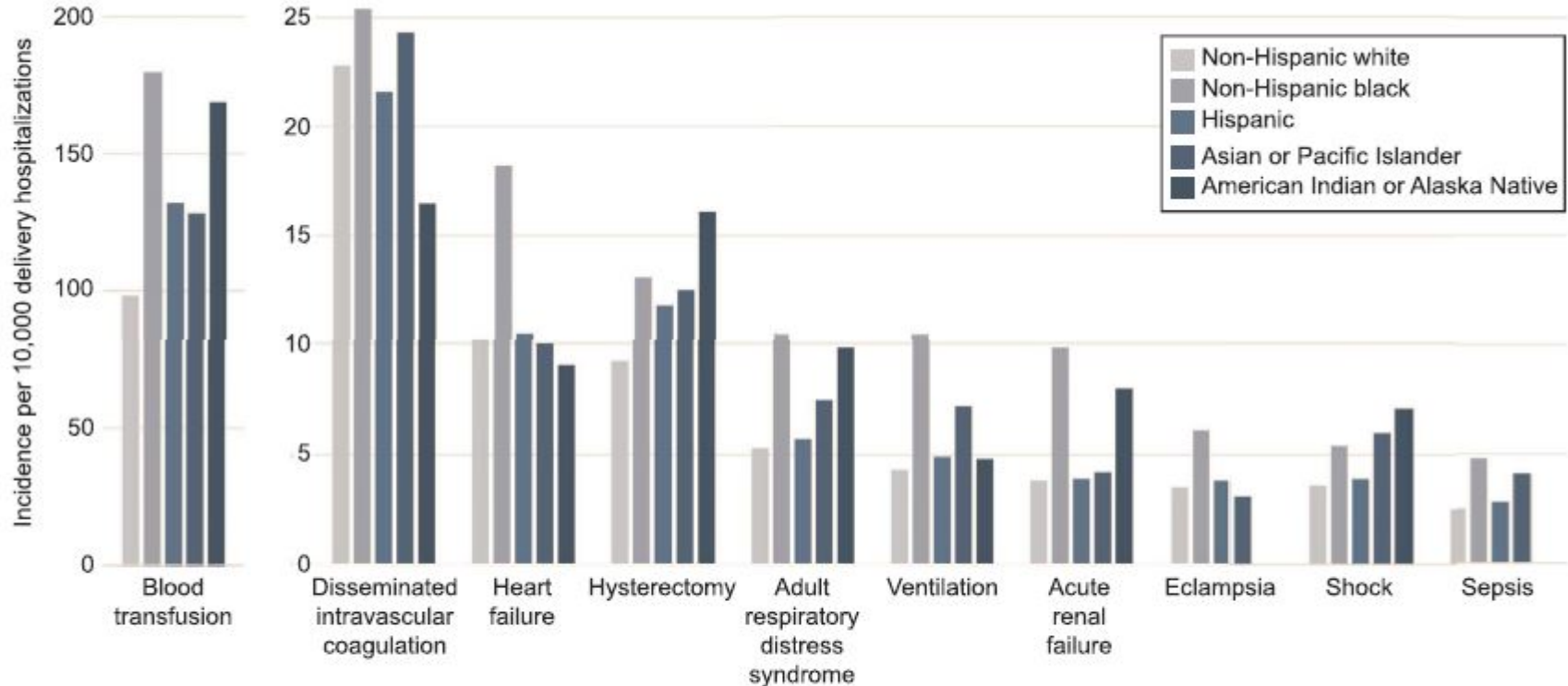


Fig. 2. Incidence of the 10 most frequent severe maternal morbidities per 10,000 delivery hospitalizations by race and ethnicity, United States, 2012–2015 (N=2,523,528). All data are survey-weighted and represented as rate per 10,000 delivery hospitalizations (95% CI). Adjusted for age, income, payer, rural vs urban residence, and hospital region.

Admon. Racial and Ethnic Disparities in Maternal Morbidity. Obstet Gynecol 2018.

Admon. Racial and Ethnic Disparities in the Incidence of Severe Maternal Morbidity in the United States, 2012-2015 Obstet Gynecol. 2018 Oct 5.

Racism & Discrimination

Patient Factors

- Socio-demographics: age, education, poverty, insurance, marital status, employment, language, literacy, disability
- Knowledge, beliefs, health behaviors
- Psychosocial: stress, weathering, social support

Community/ Neighborhood

- Community, social network
- Neighborhood: crime, poverty, built environment, housing

Clinician Factors

- Knowledge, experience, implicit bias, cultural humility, communication

System Factors

- Access to high quality care, transportation, structural racism, policy

Health status: comorbidities (e.g. HTN, DM, obesity, depression);
Pregnancy complications

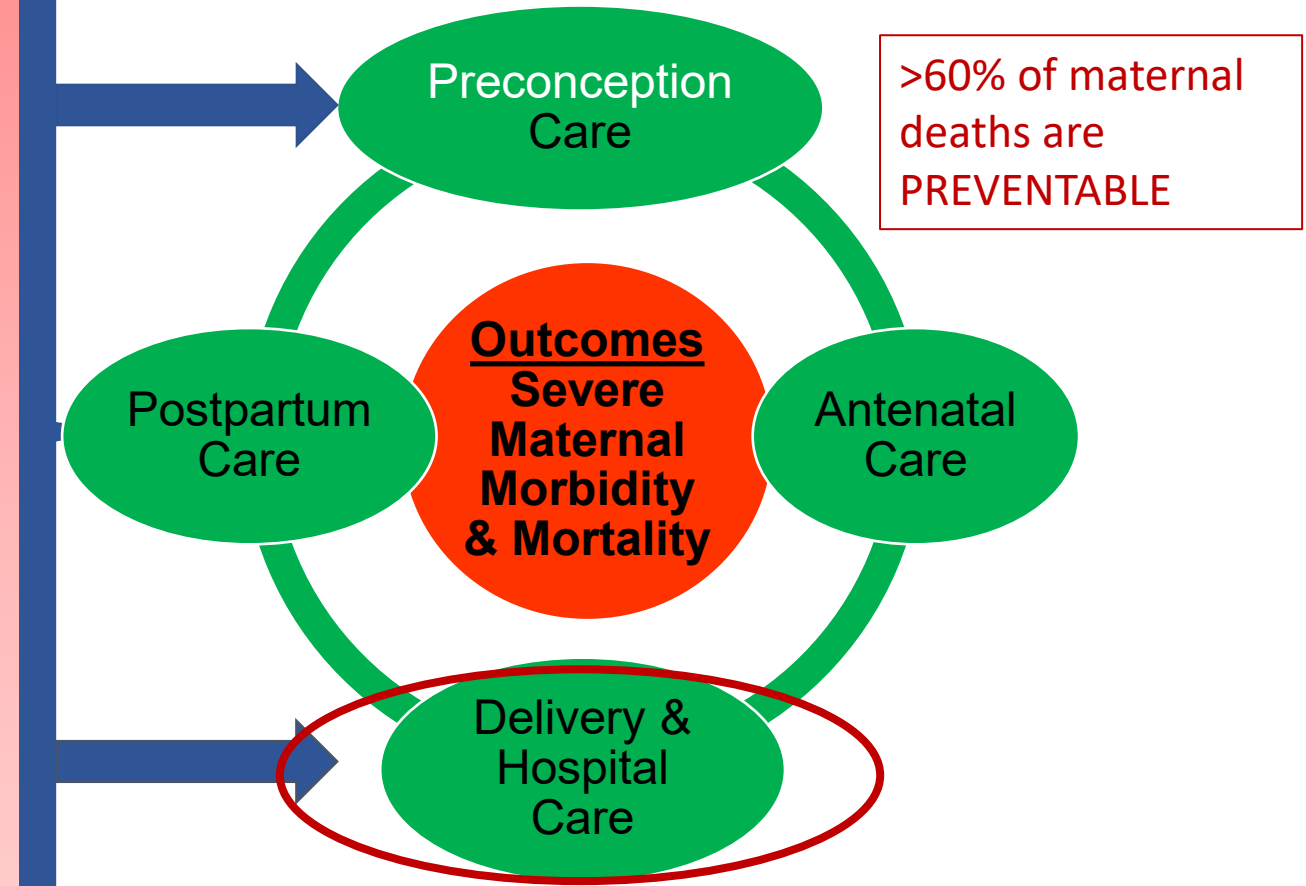
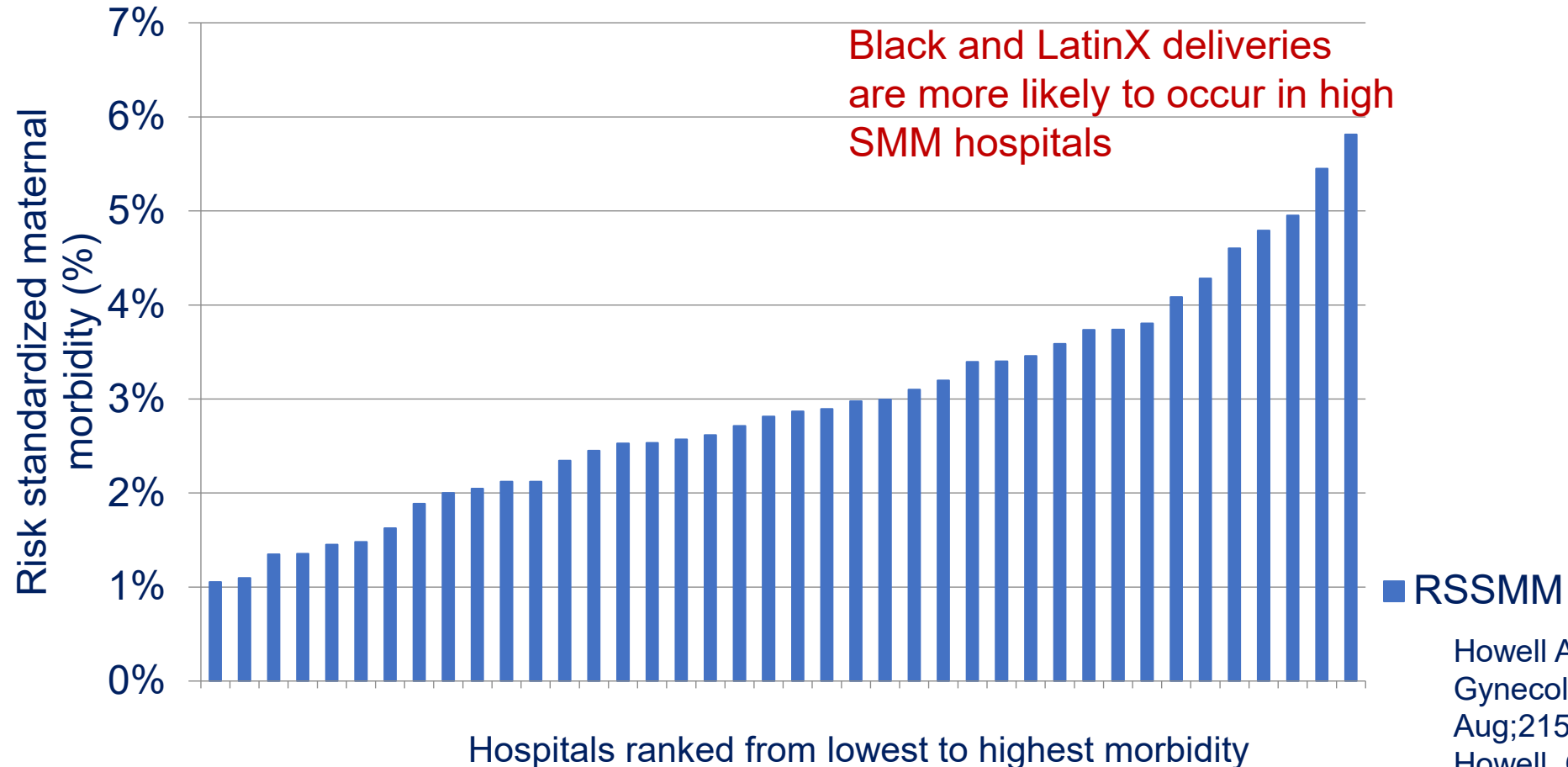


Figure 1: Pathways to Racial and Ethnic Disparities in Severe Maternal Morbidity & Mortality

Adapted from Howell EA. Clin Obstet Gynecol. 2018 Jun;61(2):387-399

New York City Hospital Performance on Severe Maternal Morbidity

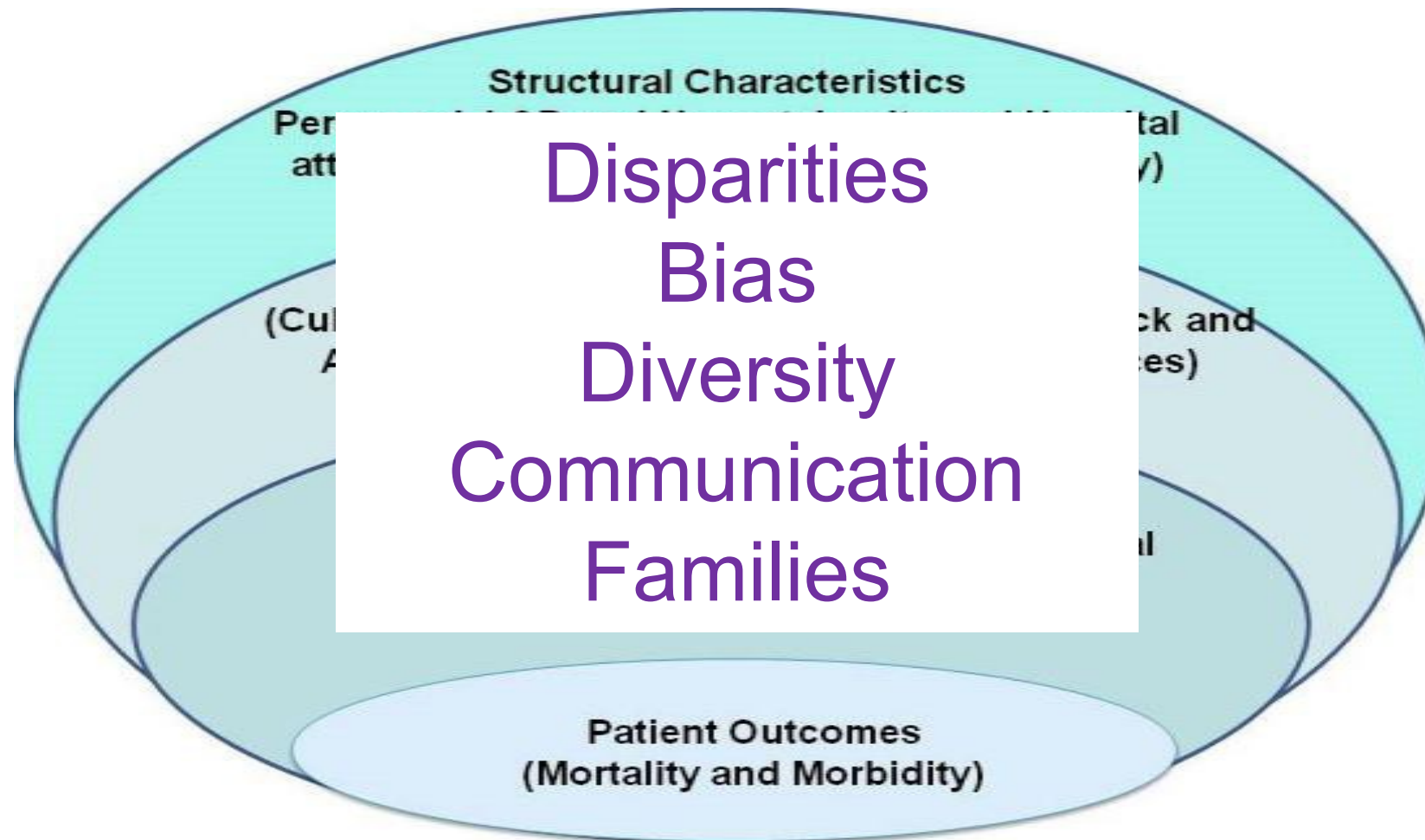
Between-Hospital Differences



Observed rates: 0.6% to 11.5%; Risk standardized rates: 0.8% to 5.7%

Howell Am J Obstet Gynecol. 2016 Aug;215(2):143-52; Howell. Obstet Gynecol. 2017 Feb;129(2):285-294

Hospital Factors, Quality, and Disparities



Howell. Semin Perinatol. 2017 Aug;41(5):266-272

Themes From Qualitative Interviews

Shared themes

- Nurse staffing issues
- Wide variation in quality measurement and improvement
- *No one analyzed data to compare performance across race, ethnicity or insurance source*

High performing hospitals more likely to have:

- Stronger focus on standards and standardized care
- Stronger nurse physician communication / teamwork
- Sharing of performance data with nurses and other frontline clinicians
- *More awareness that disparities, racism may be present in hospital and could lead to differential treatments*

Within-Hospital Differences

Original Research

Race and Ethnicity, Medical Insurance, and Within-Hospital Severe Maternal Morbidity Disparities

Elizabeth A. Howell, MD, MPP, Natalia N. Egorova, PhD, MPH, Teresa Janevic, PhD, MPH, Michael Brodman, MD, Amy Balbierz, MPH, Jennifer Zeitlin, DSc, MA, and Paul L. Hebert, PhD

OBJECTIVE: To examine within-hospital racial and ethnic disparities in severe maternal morbidity rates and determine whether they are associated with differences in types of medical insurance.

hospital adjusted rates using paired *t*-tests and conditional logit models.

RESULTS: Severe maternal morbidity was higher among black and Latina women than white women (4.2% and

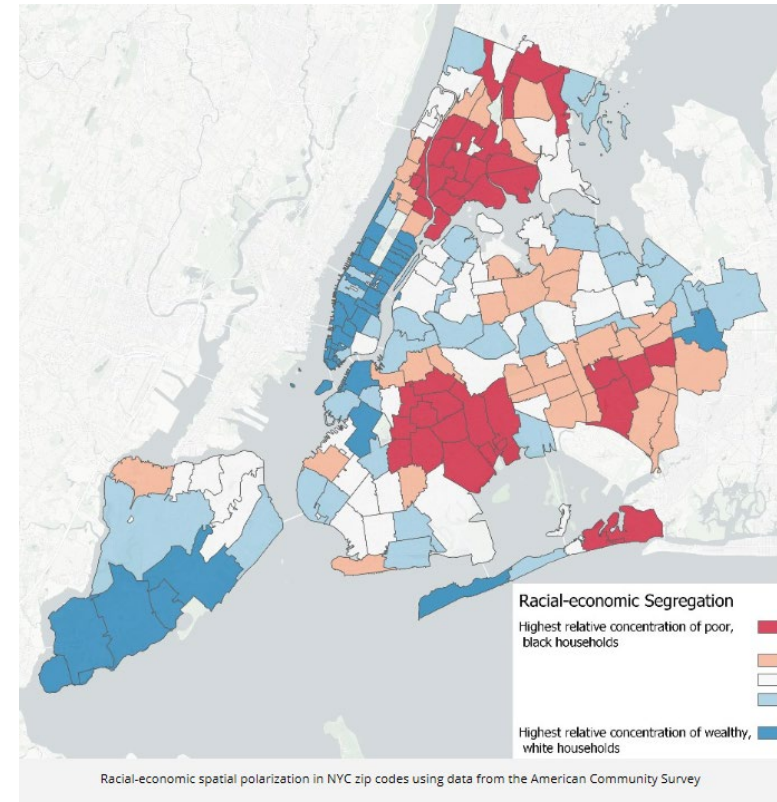
Racial-economic Segregation in New York City

MATERNAL & CHILD HEALTH

By Teresa Janevic, Jennifer Zeitlin, Natalia Egorova, Paul L. Hebert, Amy Balbierz, and Elizabeth A. Howell

Neighborhood Racial And Economic Polarization, Hospital Of Delivery, And Severe Maternal Morbidity

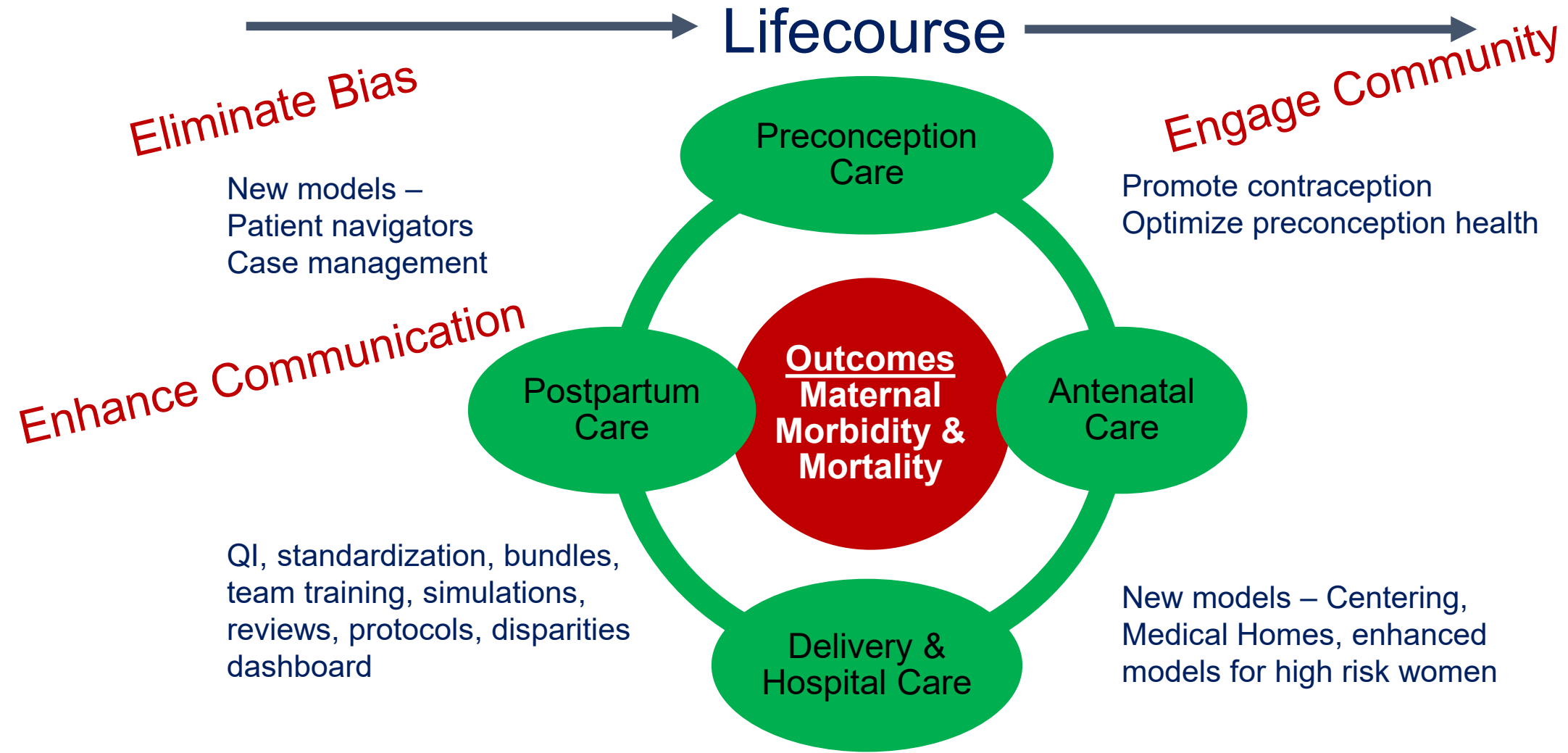
ABSTRACT Recent national and state legislation has called attention to stark racial/ethnic disparities in maternal mortality and severe maternal morbidity (SMM), the latter of which is defined as having a life-threatening condition or life-saving procedure during childbirth. Using linked New York City birth and hospitalization data for 2012–14, we examined whether racial and economic spatial polarization is associated with SMM rates, and whether the delivery hospital partially explains the association. Women in ZIP codes with the highest concentration of poor blacks relative to wealthy whites experienced 4.0 cases of SMM per 100 deliveries, compared with 1.7 cases per 100 deliveries among women in the neighborhoods with the lowest concentration (risk difference = 2.4 cases per 100). Thirty-five percent of this difference was attributable to the delivery hospital. Women in highly polarized neighborhoods were most likely to deliver in hospitals located in similarly polarized neighborhoods. Housing policy that targets racial and economic spatial polarization may address a root cause of SMM, while hospital quality improvement may mitigate the impact of such polarization.



BFWHRI Blog:

<https://health.mountsinai.org/blog/structural-racism-and-coronavirus-in-nyc-what-will-be-the-toll-on-maternal-health-equity/>

Levers to Reduce Severe Maternal Morbidity & Mortality



A Path Forward for NIH

Recommendations

- Consider an Institute for Women's Health
- Expand research on pregnant women and long-term health outcomes
- Invest in health services research and implementation science
- Enroll pregnant women in clinical trials
- Expand research on structural racism, and other root causes of inequities in women's health
- Expand research on gynecology
- Diversify NIH – more ob/gyns needed at NIH; more ob/gyns funded as PIs

"MOST HEALTH DISPARITIES ARE
AVOIDABLE. THEY RESULT FROM
DECISIONS WE MAKE AS A SOCIETY
REGARDING HOW WE ALLOCATE
OUR RESOURCES AND HOW MUCH
INJUSTICE WE ARE WILLING TO
ACCEPT AS A FACT OF LIFE."

—Lisa Cooper

Johns Hopkins health equity expert

THANK YOU

NIH #RO1MD007651

NIH #RO1MD016029

@LizHowellMD

Elizabeth.howell1@pennmedicien.upenn.edu

