NATIONAL ACADEMIES *Sciences Engineering Medicine*

Examining Diagnostic Disparities in Cardiovascular Disease

Session 2: Considering Diagnostic Disparities Across Clinical Conditions

Advancing Equity in Diagnostic Excellence to Reduce Health Disparities

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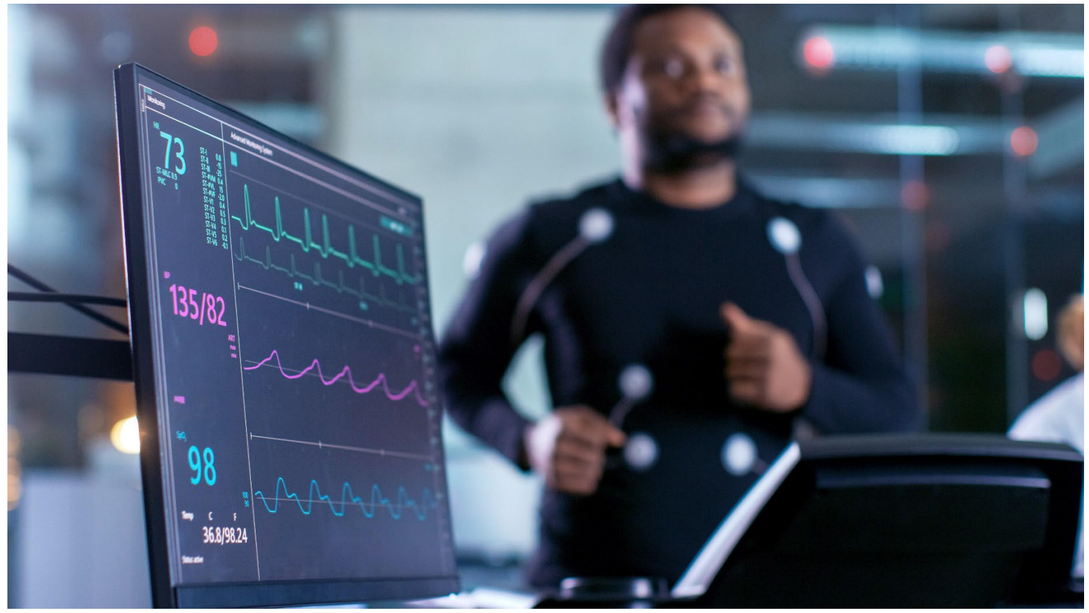
  - AHA/DDCF 24DECCAEG1258968

How It Started



How It's Going

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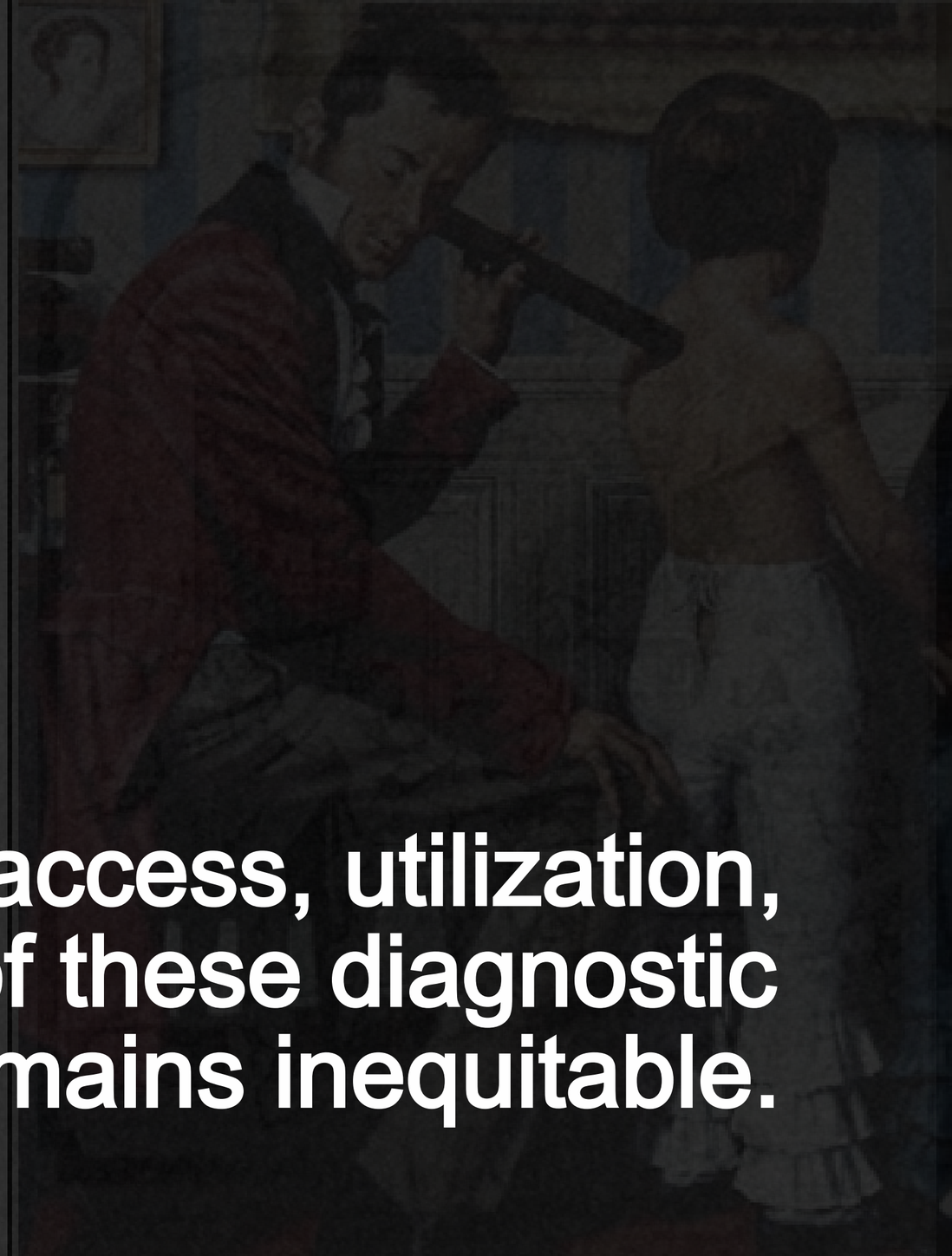
We have made remarkable advances in our diagnostic toolbox for CVD…



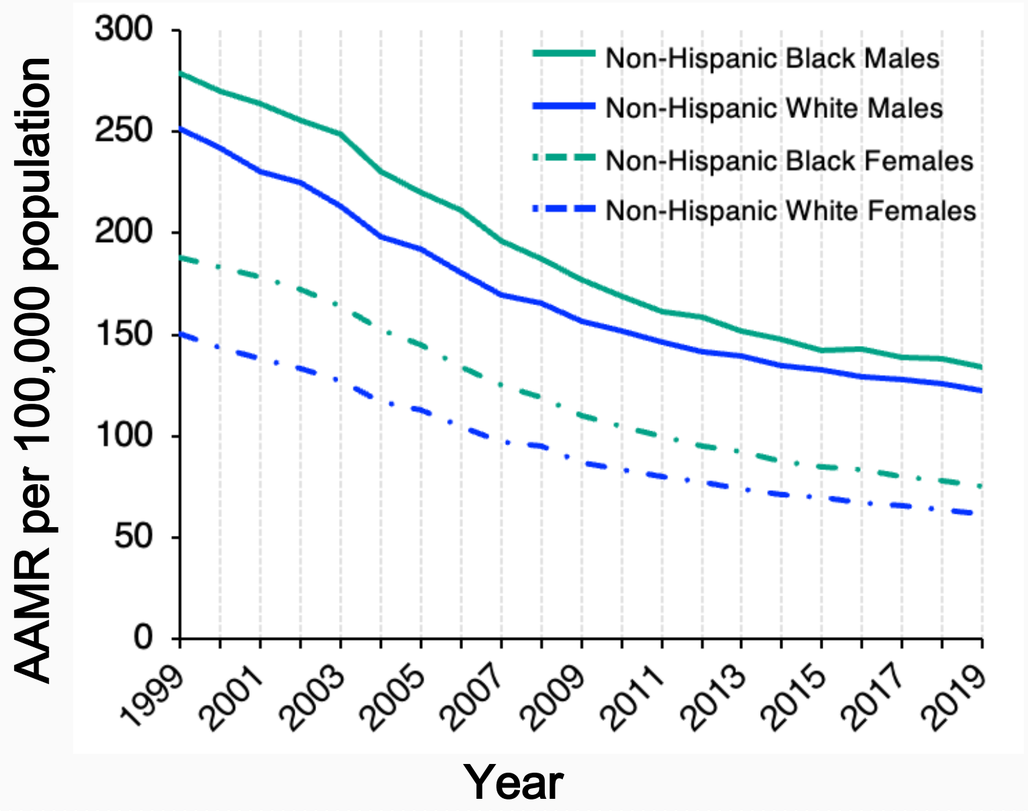
However, access, utilization, and cost of these diagnostic tools remains inequitable.

Objectives

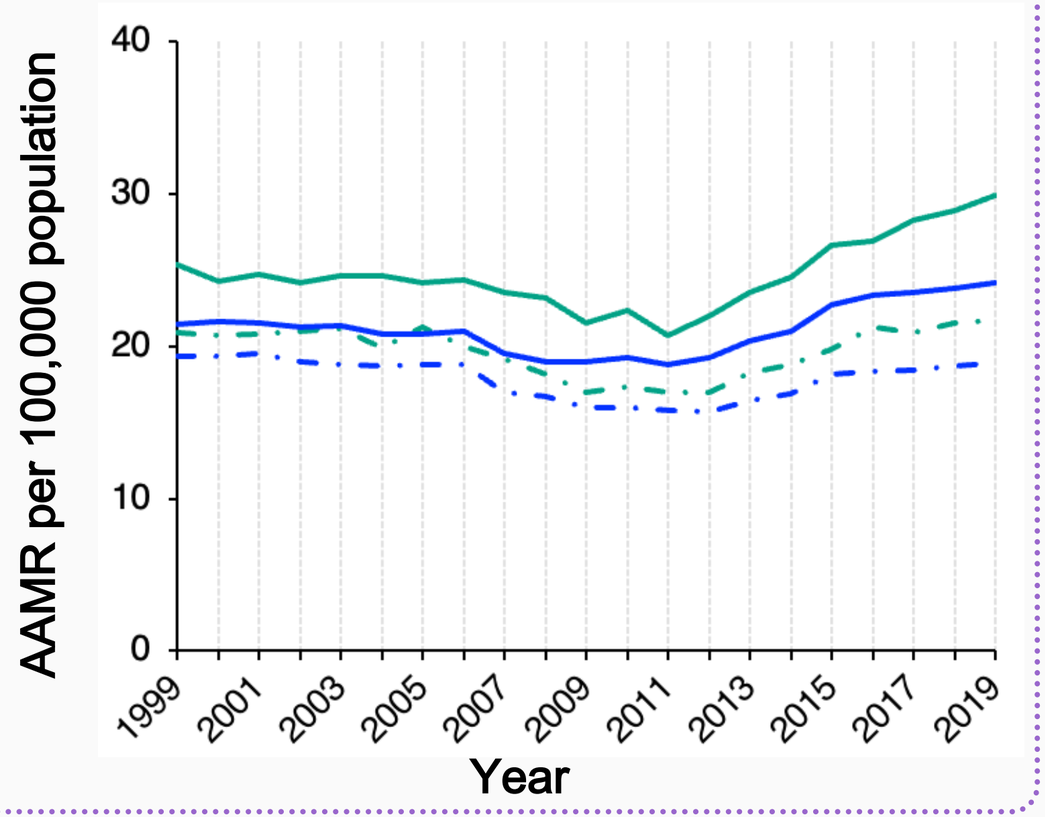
1. Burden of and disparities in CVD in the US
2. Structural barriers to equitable diagnosis of CVD
3. Clinician bias in equitable diagnosis of CVD
4. Future directions for diagnostic equity in CVD

Racial and Ethnic Disparities in CVD Mortality

Age-Adjusted Mortality Rates for Ischemic HD in US by Race and Ethnicity: 1999 -2019



Age-Adjusted Mortality Rates for HF in US by Race and Ethnicity: 1999 -2019



Shah NS et. al. *JAMA.* 2019

Sex and Gender Disparities in CVD

The *Lancet* women and cardiovascular disease Commission: reducing the global burden by 2030

Birgit Vogel, Monica Acevedo, Yolande Appelman, C Noel Bairey Merz, Alaide Chieffo, Gemma A Figtree, Mayra Guerrero, Vijay Kunadian, Carolyn S P Lam, Angela H E M Maas, Anastasia S Mihailidou, Agnieszka Olszanecka, Jeanne E Poole, Clara Saldarriaga, Jacqueline Saw, Liesl Zühlke, Roxana Mehran

Cardiovascular disease is the leading cause of death in women. Decades of grassroots campaigns have helped to raise awareness about the impact of cardiovascular disease in women, and positive changes affecting women and their health have gained momentum. Despite these efforts, there has been stagnation in the overall reduction of cardiovascular disease burden for women in the past decade. Cardiovascular disease in women remains understudied, under-recognised, underdiagnosed, and undertreated. This Commission summarises existing evidence and identifies knowledge gaps in research, prevention, treatment, and access to care for women. Recommendations from an international team of experts and leaders in the field have been generated with a clear focus to reduce the global burden of cardiovascular disease in women by 2030. This Commission represents the first effort of its kind to connect stakeholders, to ignite global awareness of sex-related and gender-related disparities in cardiovascular disease, and to provide a springboard for future research.

Lancet 2021; 397: 2385–438

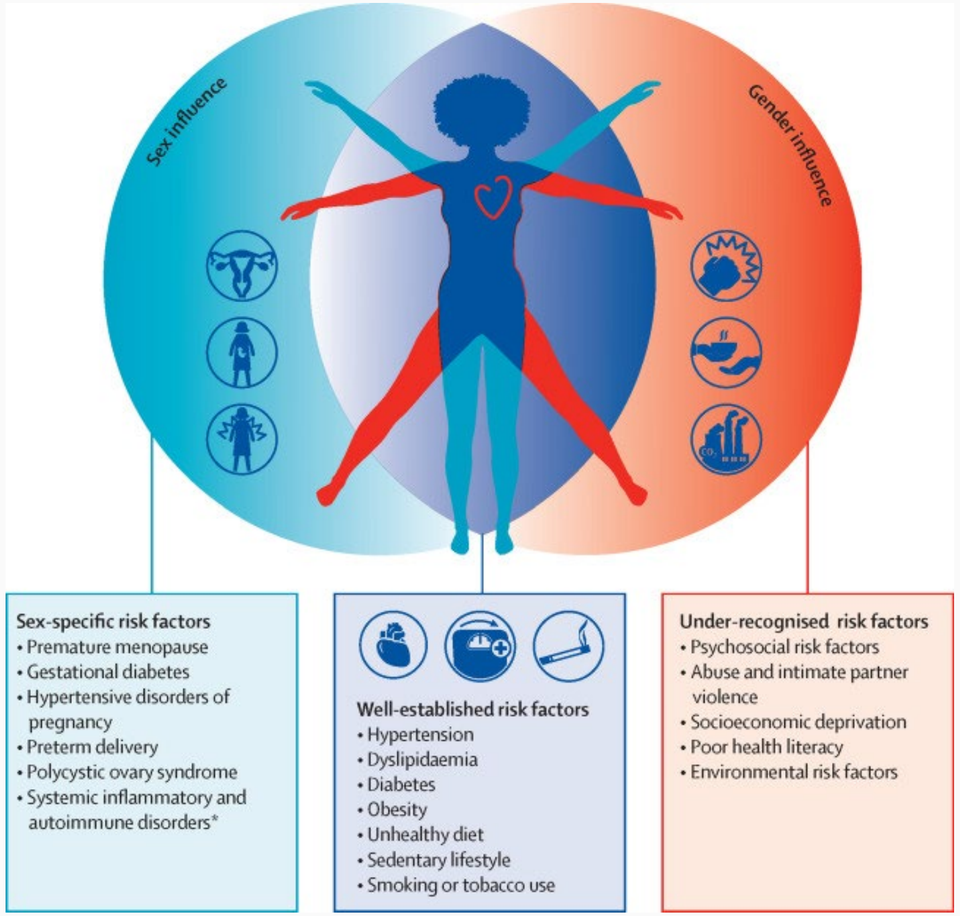
Published Online May 16, 2021 https://doi.org/10.1016/S0140-6736(21)00684-X

See Comment page 2315

See Perspectives page 2326

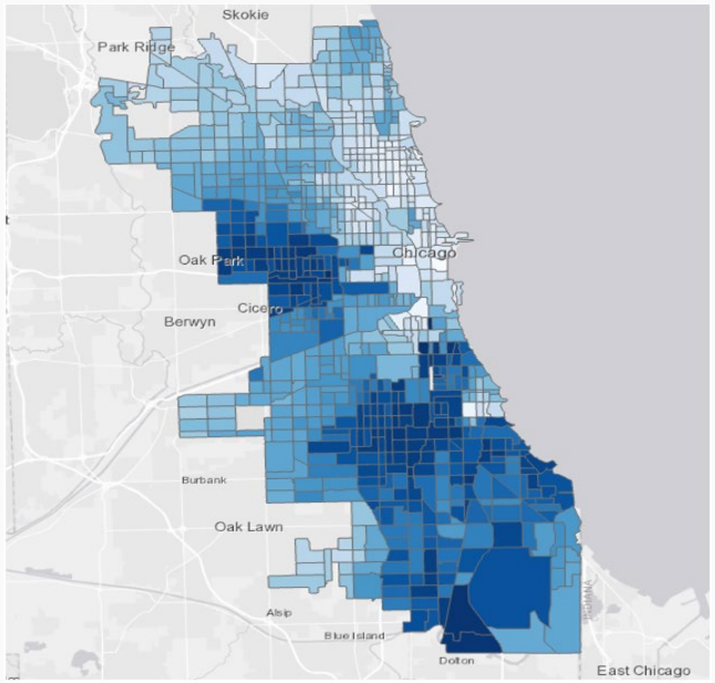
Icahn School of Medicine at Mount Sinai, New York, NY, USA (B Vogel MD, Prof R Mehran MD); Divisón de

Cardiovascular disease in women remains understudied, under-recognized, underdiagnosed, and undertreated



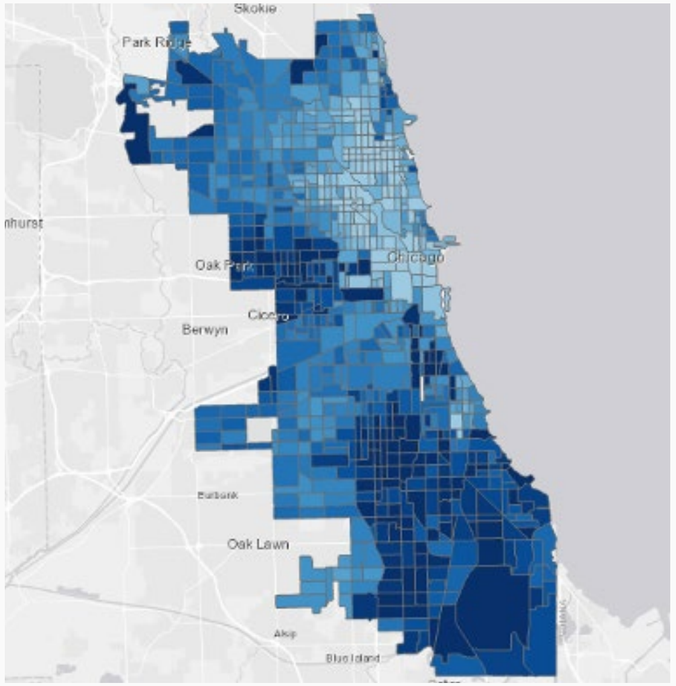
Place-Based Disparities in CVD

Age-Standardized Prevalence of Obesity



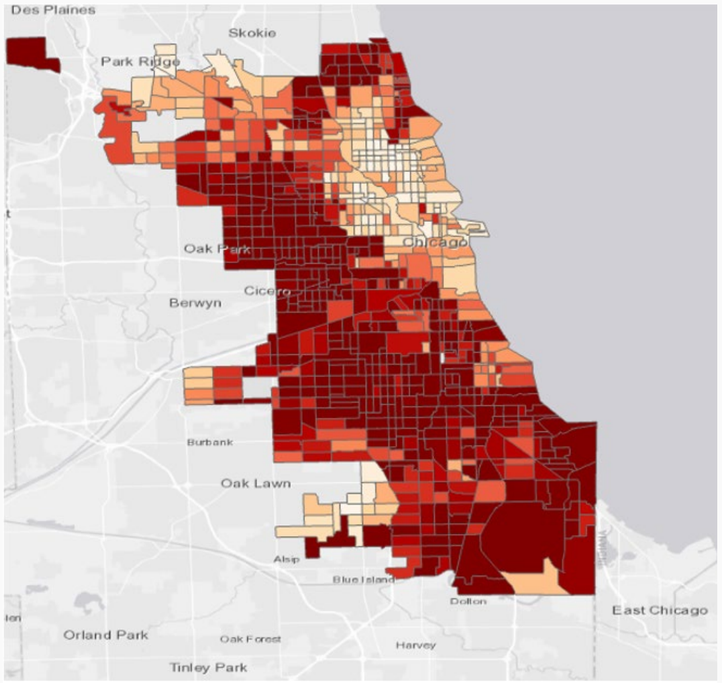
9.6 — 56.0/100,000

Age-Standardized Prevalence of CHD



1.0 — 36.0/100,000

Social Vulnerability Index



0 — 1.0

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Data accessed from the CDC 500 Cities Project

61%

of US adults will have obesity by 2050

26.8%

of US adults will have diabetes by 2050

$1.8tr

projected healthcare spending by 2050

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Joynt-Maddox K et. al. Circulation 2024
Kazi D et. al. Circulation 2024

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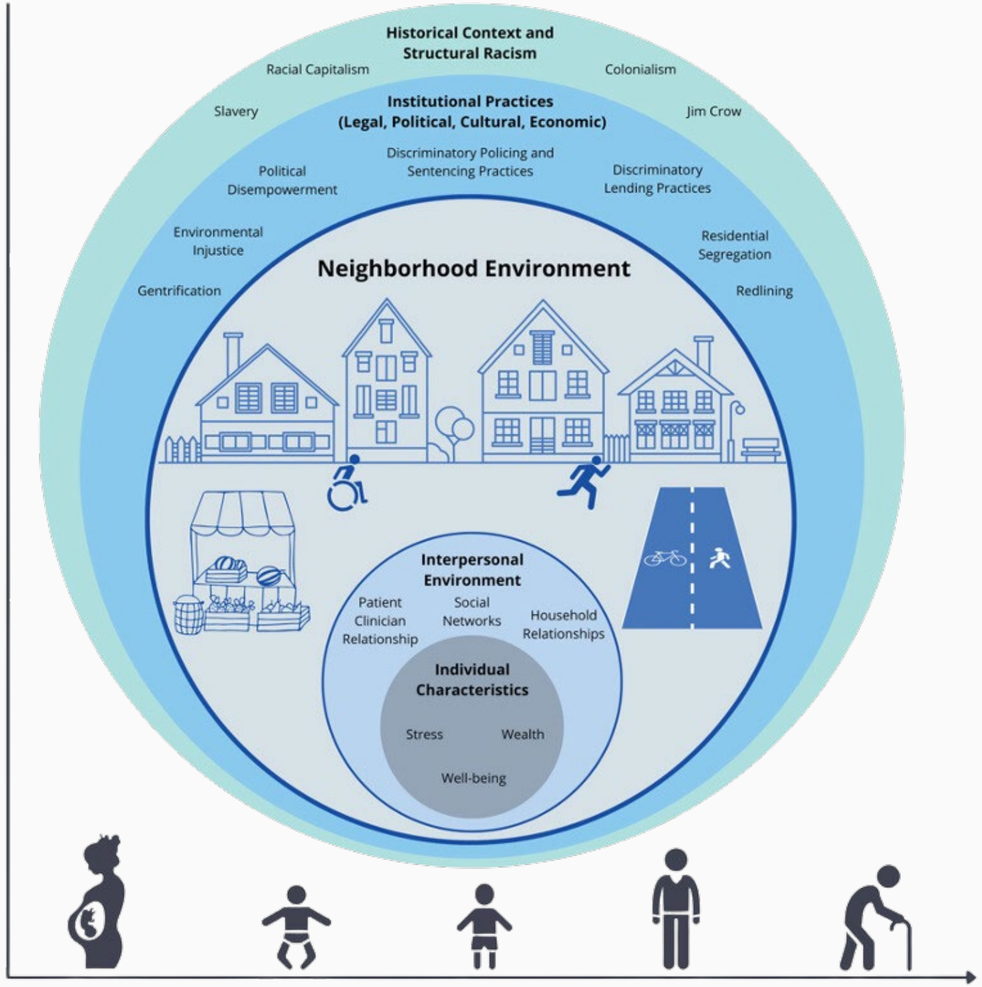
Joynt-Maddox K et. al. Circulation 2024
Kazi D et. al. Circulation 2024

Multi-Level Risk Factors for CVD



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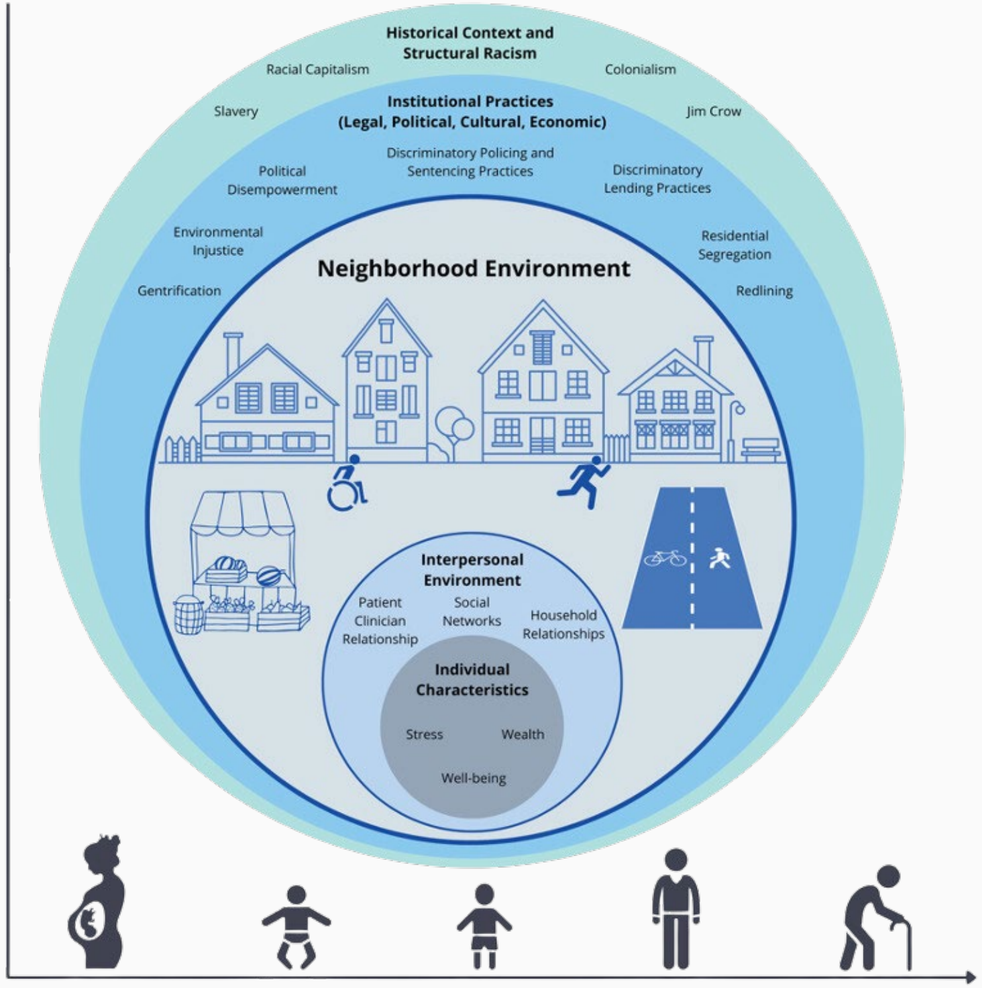
Kershaw KN et. al. *Circ Qual. Outcomes* 2023

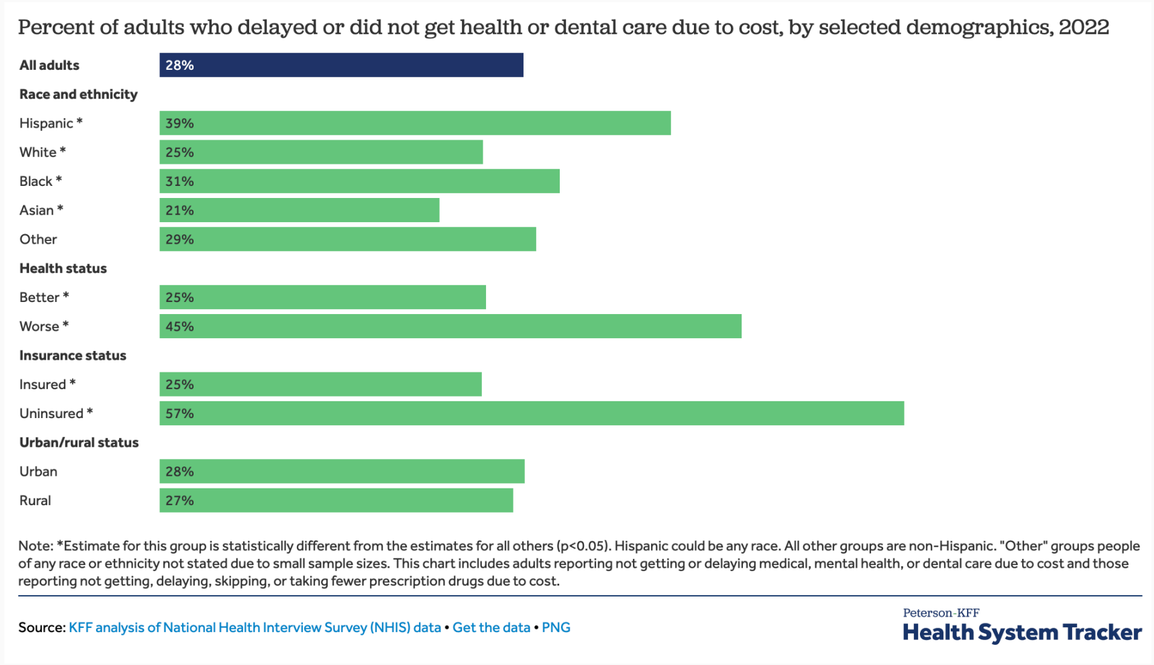
Multi-Level Drivers of Diagnostic Disparities

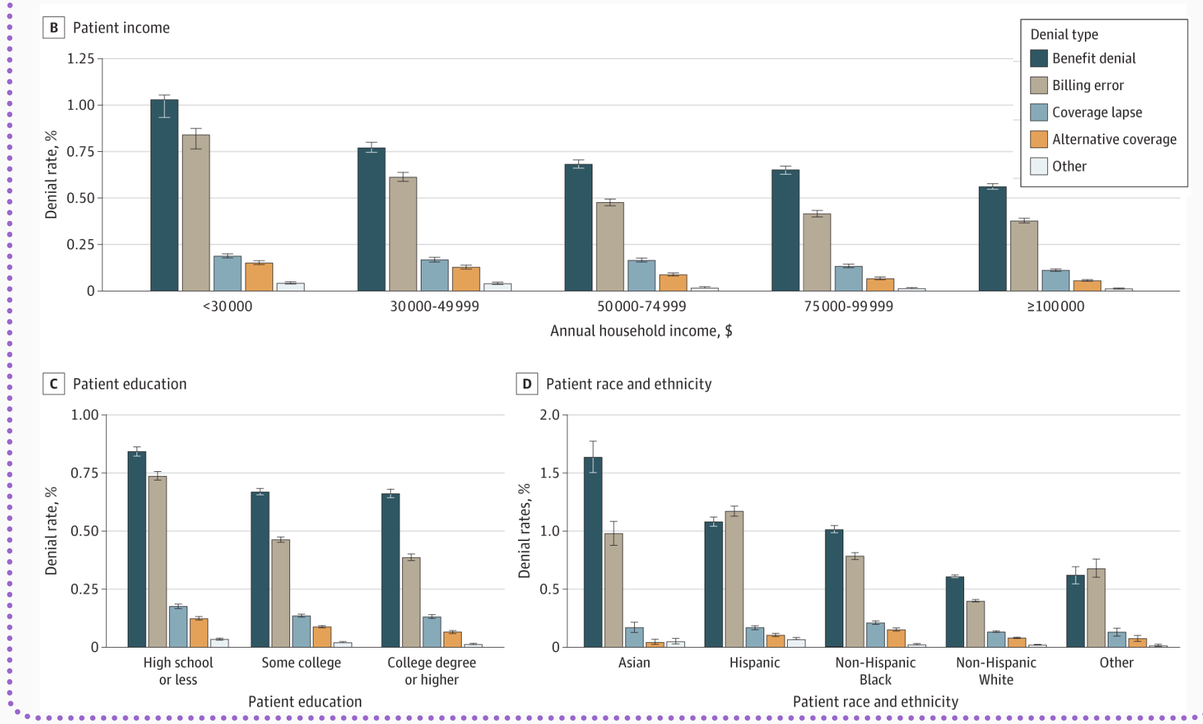


- Implicit bias among clinicians
- Barriers to timely and accurate diagnosis
- Awareness in symptom recognition
- Health care access for diagnostic testing, screening, and risk assessment

Kershaw KN et. al. *Circ Qual. Outcomes* 2023
Sarkar U and Bibbins-Domingo K. *JAMA* 2022

Delays and Denials in Health Care are Ubiquitous





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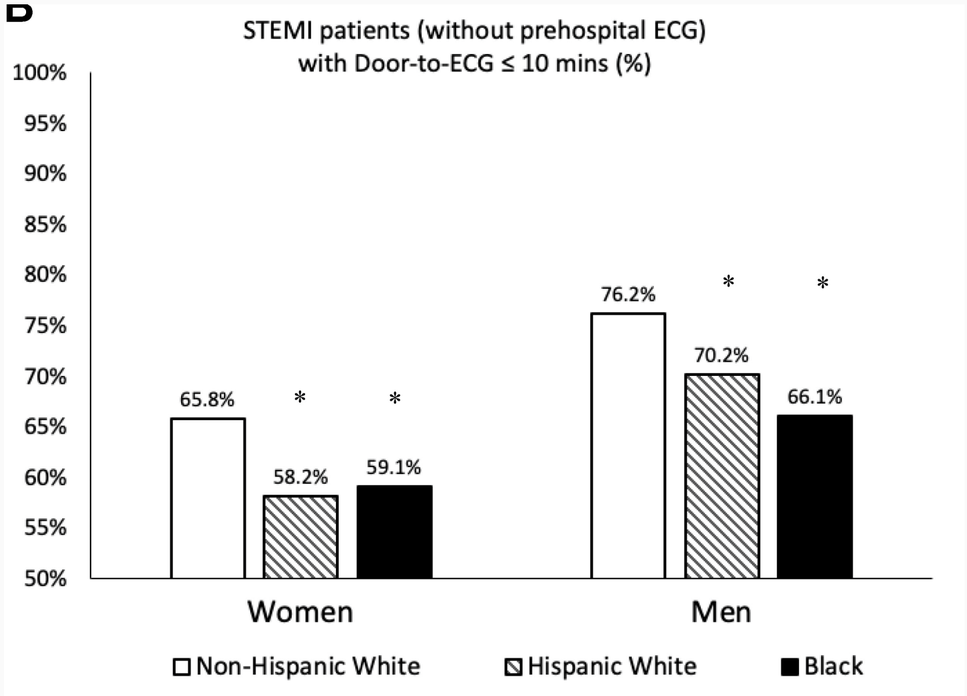
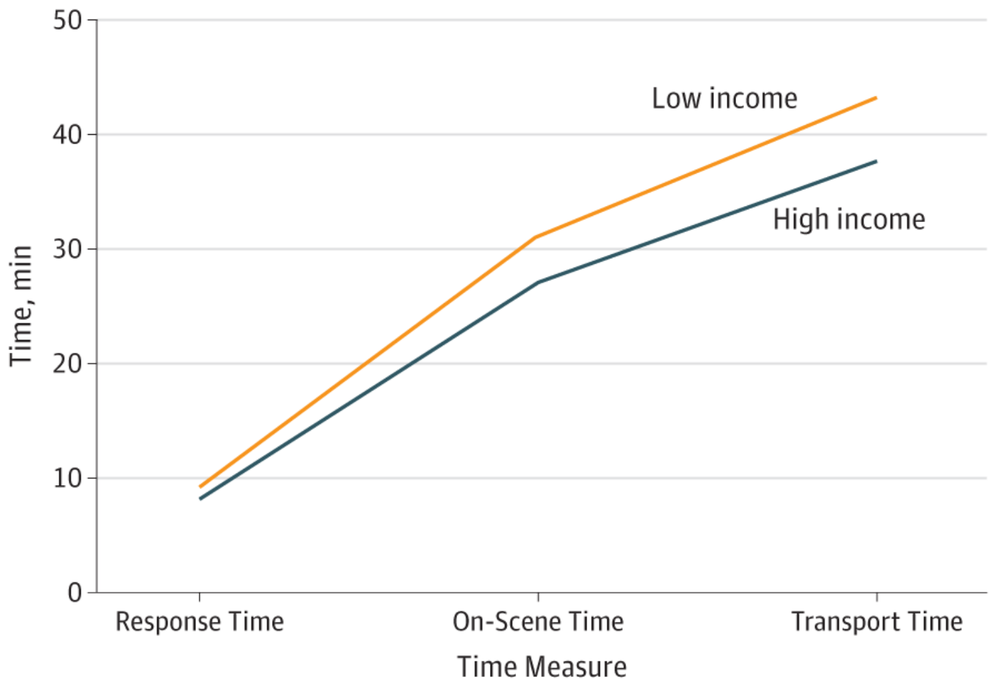
KFF Online Accessed 9/2024
Hoagland et. al. *JAMA Netw. Open* 2024

Structural Barriers to Timely and Accurate Diagnosis

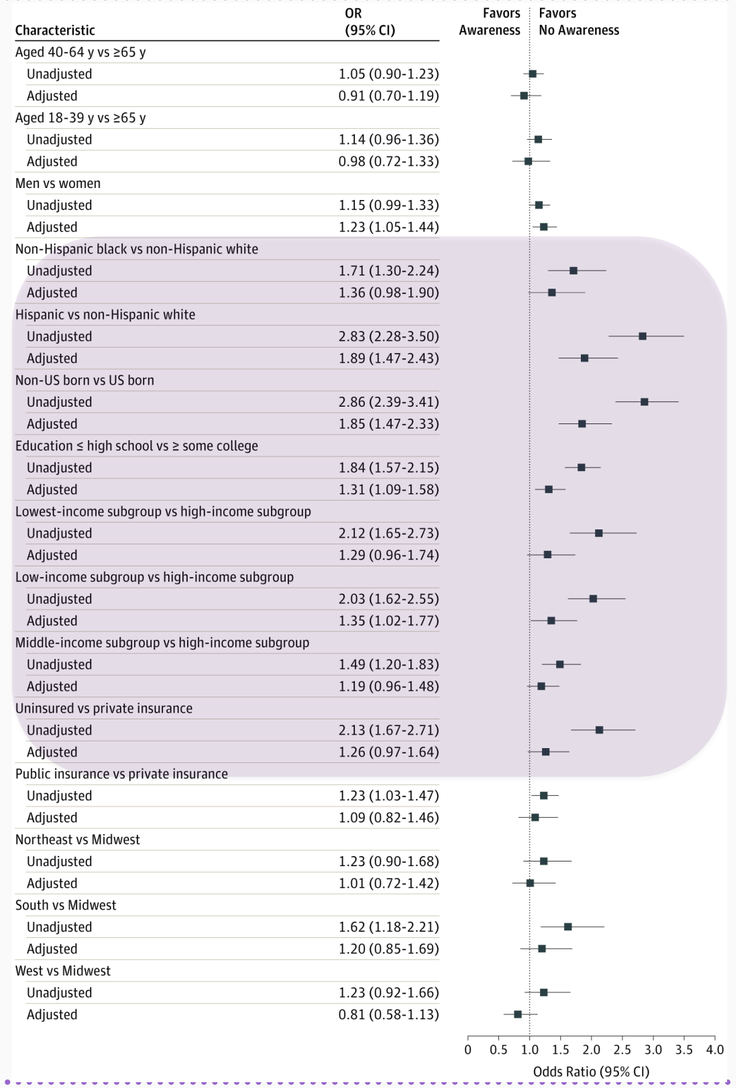


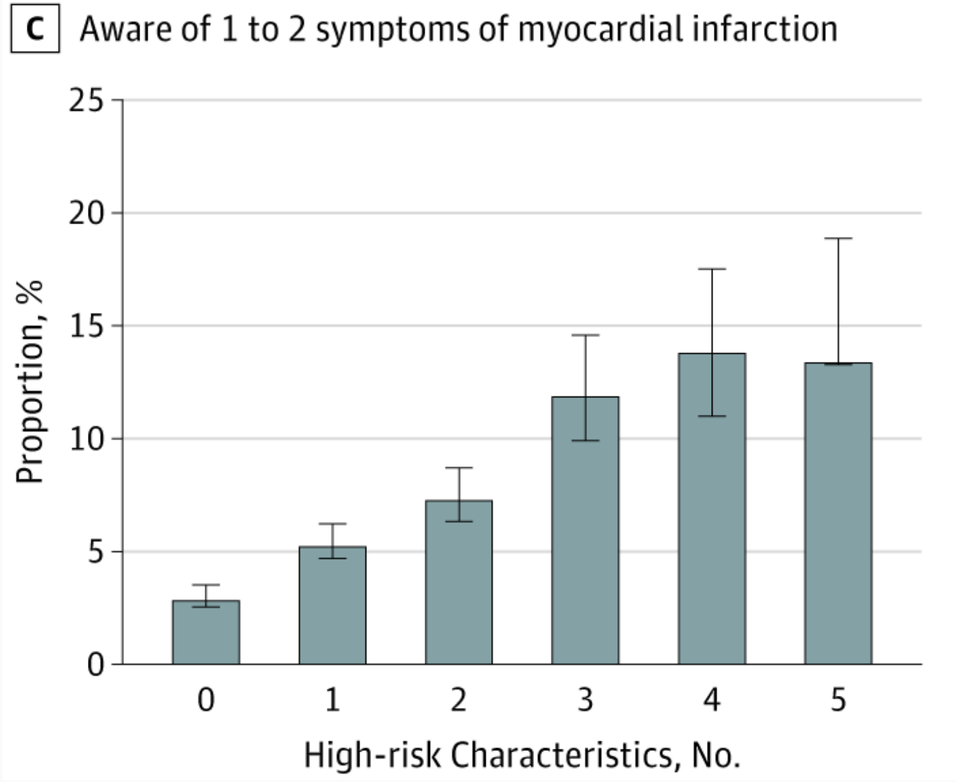


Osho A. et. al. *Circulation* 2023
Hsia R. et. al. *JAMA Netw.. Open* 2018

Disproportionate Delays due to Fragmented Patient Care

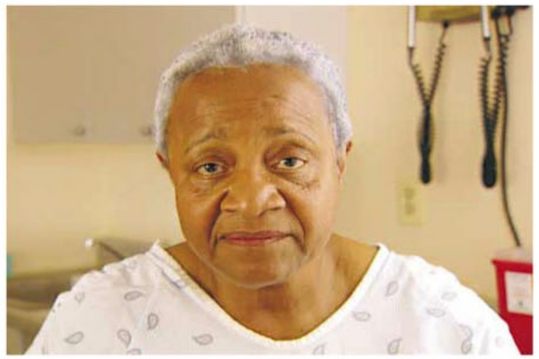
Significant Gaps in CVD Symptom Awareness





Mahajan S et. al. *JAMA Netw. Open* 2019

Implicit Bias in Acute Management of Chest Pain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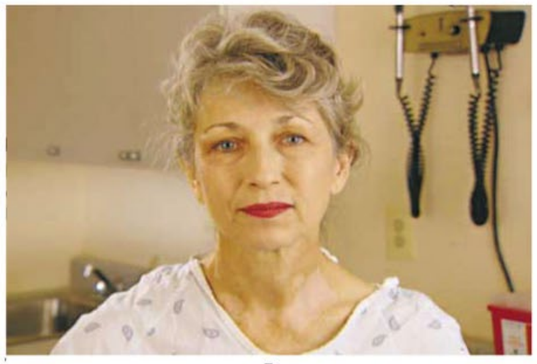
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TABLE 5. PREDICTORS OF REFERRAL FOR CARDIAC CATHETERIZATION.*

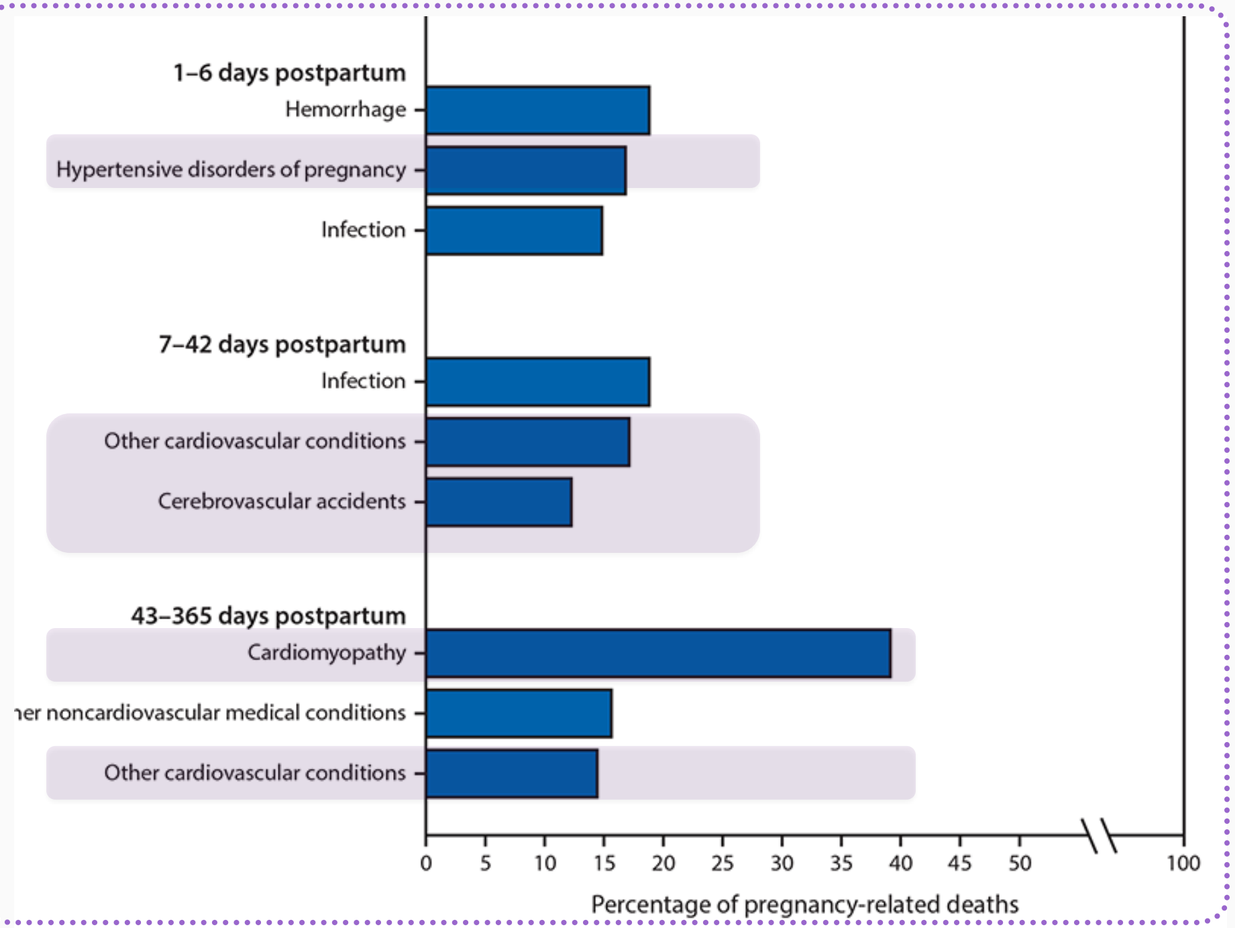
MODEL AND VARIABLE	ODDS RATIO (95% CI)†	P VALUE
Race and sex as separate factors		
Sex		
Male	1.0	
Female	0.6 (0.4–0.9)	0.02
Race		
White	1.0	
Black	0.6 (0.4–0.9)	0.02
Interaction of race and sex		
White male	1.0	
Black male	1.0 (0.5–2.1)	0.99
White female	1.0 (0.5–2.1)	>0.99
Black female	0.4 (0.2–0.7)	0.004

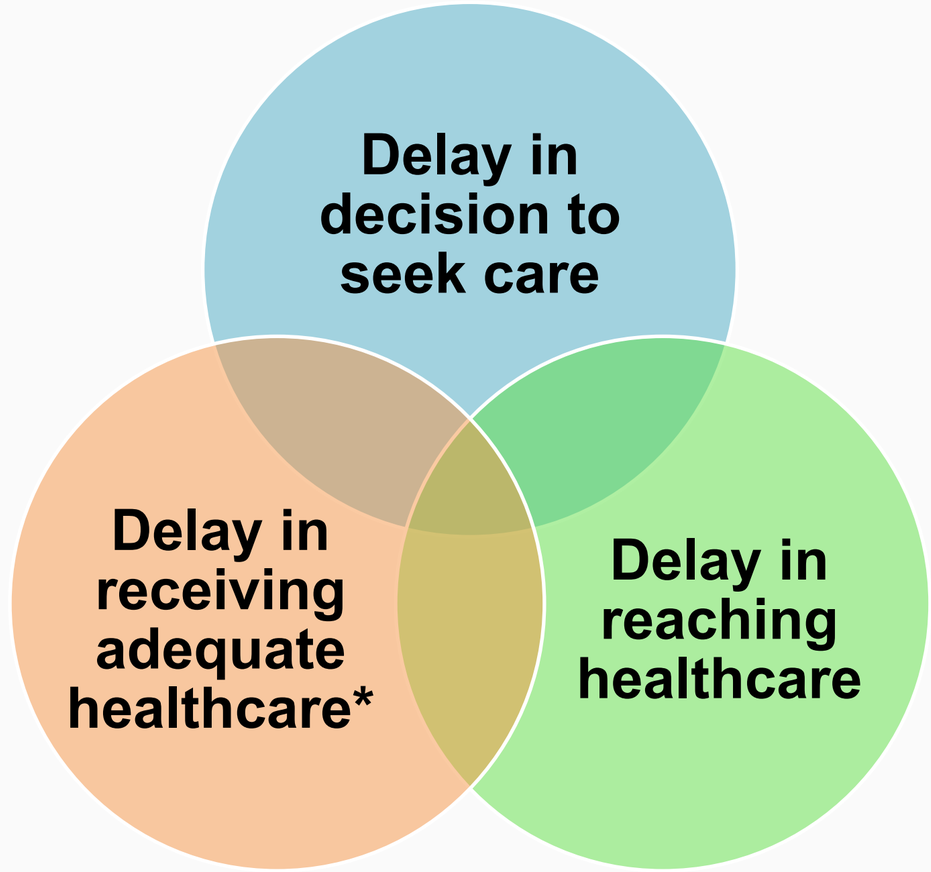
*Both models included all experimental factors as covariates, as well as the probability of coronary artery disease as estimated after the results of the stress tests were known. The first analysis included only the main effects. The second analysis explored a race–sex interaction.

†CI denotes confidence interval.

Powell-Wiley et. al. *Circulation* 2021

Diagnostic Inequities Contribute to CVD in MMM





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Peterson E et. al. *MMWR* 2019

Multi-Level Opportunities for Diagnostic Equity

Implicit bias training among clinicians and development of diverse workforce

Assess and address SDOH

Increased public awareness of CVD risk

Increased access to patient-centered, holistic preventive care

Ndumele CN et. al. *Circulation* 2023

Key Takeaways for Diagnostic Equity in CVD

1. Burden of cardiovascular disease is **substantial** and **increasing** with **significant disparities**, due to individual, interpersonal and structural drivers
2. Structural barriers to optimal **diagnostic testing, screening, and risk assessment** for CVD exist across the life course, particularly postpartum
3. **Clinician bias** (implicit and explicit) contributes to delays in diagnosis and misdiagnosis for minoritized populations
4. Future directions should include improved **access** to preventive care, increase **public awareness** of CVD as LCOD, systematic **assessment** and management of SDOH, and **bias training** for clinicians and health system administrators


Thank you!
Questions?
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