

# **WOMEN AND CARDIOVASCULAR CONDITIONS: A MACRO AND MICRO LOOK**

**Janine Austin Clayton, M.D.**

**Gina S. Wei, MD, MPH**

**25 February 2021**



***“Medically Ready Force...Ready Medical Force”***

# Presenter(s)



## **Janine Austin Clayton, M.D.**

National Institutes of Health (NIH) Associate Director for Research on Women's Health  
Director, Office of Research on Women's Health (ORWH)  
National Institutes of Health

## **Gina S. Wei, MD, MPH**

Associate Director for Prevention and Population Sciences  
Division of Cardiovascular Sciences  
National Heart, Lung, and Blood Institute (NHLBI)



# Janine Austin Clayton, M.D.



- Dr. Clayton was appointed Associate Director for Research on Women's Health and Director of the Office of Research on Women's Health at the National Institutes of Health (NIH) in 2012. Dr. Clayton has strengthened NIH support for research on diseases, disorders, and conditions that affect women. She is the architect of the NIH policy requiring scientists to consider sex as a biological variable across the research spectrum, a part of NIH's initiative to enhance reproducibility, rigor, and transparency. As co-chair of the NIH Working Group on Women in Biomedical Careers with NIH Director Dr. Francis Collins, Dr. Clayton also leads NIH's efforts to advance women in science careers.
- Dr. Clayton was previously the Deputy Clinical Director of the National Eye Institute (NEI). A board-certified ophthalmologist, Dr. Clayton's research interests include autoimmune ocular diseases and the role of sex and gender in health and disease. Dr. Clayton has a particular interest in ocular surface disease and discovered a novel form of disease associated with premature ovarian insufficiency that affects young women, setting the stage for her commitment to rigorous, thoughtful exploration of the role of sex and gender in health and disease. She is the author of more than 120 scientific publications, journal articles, and book chapters. Her clinical research has ranged from randomized controlled trials of novel therapies for immune-mediated ocular diseases to studies on the development of digital imaging techniques for the anterior segment.

# Gina S. Wei, M.D., M.P.H.



- Dr. Wei is an Associate Director of the Division of Cardiovascular Sciences (DCVS) at the NHLBI, NIH. She also directs DCVS' Prevention and Population Sciences Program, which funds and provides leadership for population- and clinic-based research on the causes, prevention, and clinical care of heart, lung, blood, and sleep disorders. Notable studies in her Program include the Systolic Blood Pressure Intervention Trial (SPRINT), Women's Health Initiative (WHI), the Framingham Heart Study, and the Jackson Heart Study, to name a few. Also in the Program is the NHLBI's Data Access Committee leadership team.
- Beyond her Program, Dr. Wei has played leadership roles in several areas for the NHLBI, including population sciences, precision medicine, data science, and maternal health. She co-chairs NHLBI's efforts on Maternal Morbidity and Mortality and is NHLBI's representative to the NIH Coordinating Committee on Research on Women's Health. She is NHLBI's co-liaison to the US Preventive Services Task Force. She was a founding co-chair of NHLBI's Data Science Working Group and Data Science Leadership Team, the latter of which she remains an active member. Dr. Wei was part of the NIH-team that led the design and stood up the NIH All of Us Research Program (previously called the Precision Medicine Initiative-Cohort Program) and until spring of 2020 was the lead NHLBI representative to the All of Us trans-NIH Liaisons Coordinating Team.
- Dr. Wei holds an Adjunct Associate Professorship of Medicine at the Uniformed Services University of the Health Sciences. She received her MD and completed internal medicine residency at the George Washington University School of Medicine. After serving as chief medical resident, she completed a fellowship in general internal medicine in a joint program with the Walter Reed Army Medical Center and the D.C. Veterans Affairs Medical Center. She worked at the US Food and Drug Administration prior to joining the NHLBI.





NIH Office of Research on Women's Health

# WOMEN AND CARDIOVASCULAR CONDITIONS: A MACRO AND MICRO LOOK

**Janine Austin Clayton, M.D.**

NIH Associate Director for Research on Women's Health

Director, Office of Research on Women's Health

National Institutes of Health

February 25, 2021

Defense Health Agency Clinical Communities Speaker Series: Emerging Priorities in Women's Health



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[www.nih.gov/women](http://www.nih.gov/women)

#ResearchForWomen

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# Learning Objectives

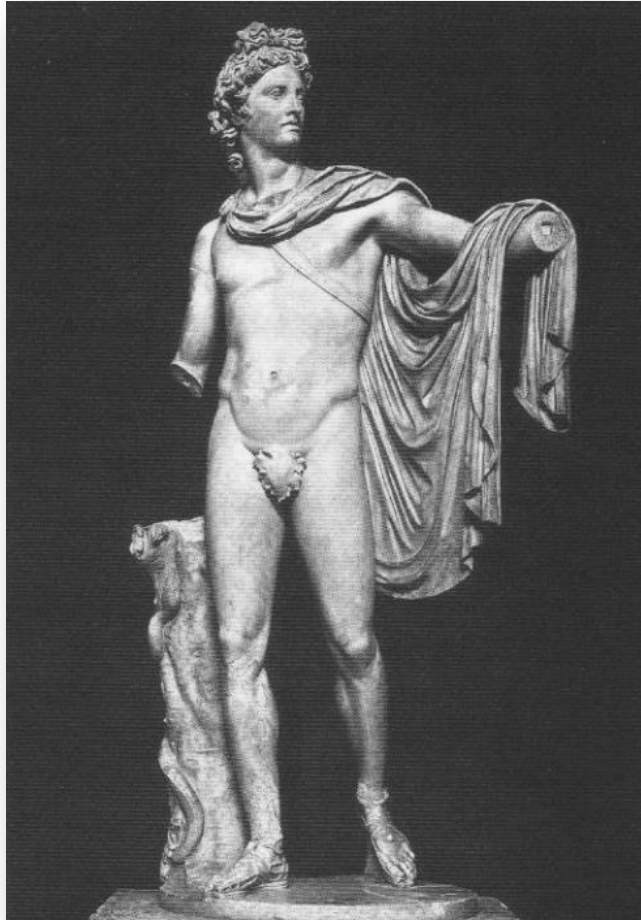


At the end of the presentation, the participants will be able to:

1. Review the origin of the NIH Office of Research on Women's Health and the principles and strategic priorities that guide women's health research across the NIH.
2. Describe how women are less likely to receive appropriate treatment for cardiovascular disease (CVD) because they manifest CVD differently than men do.
3. Discuss the rising rate of maternal mortality in the United States, its disproportionate impact on racial and ethnic minority groups, and CVD as a leading cause of maternal deaths.
4. Explain how COVID-19 can affect the cardiovascular system and how the coronavirus disproportionately affects women, people of color, and other vulnerable populations.
5. Identify opportunities throughout the life course of women for promoting cardiovascular health, including before, during and after reproductive years.
6. Select from a wide range of available resources including toolkits and guidelines to promote cardiovascular health in women.



# ORWH was established to close a knowledge gap



<https://www.gettyimages.com>

**Default human model** was 70-kg male

- Fundamental biology assumed to include only **shared** molecular, biochemical & physiologic characteristics
- Protectionism, paternalism, women's estrous cycle

Plus **preponderant use of males** in preclinical research

**Unisex Research** – like trying to hit a bull's eye in the dark

- You may hit the target, but not the bull's eye
- Degree of randomness too high for medicine

**Too little research** on diseases and conditions of women



# ORWH Mission



Enhance and expand women's health research



Include women and minority groups in clinical research

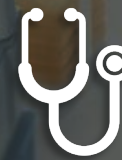


Promote career advancement for women in biomedical careers

# NIH Vision



Sex and gender integrated into biomedical research



Every woman receives evidence-based care



Women in science careers reach their full potential

# 2019-2023 Trans-NIH Strategic Plan for Women's Health Research



## Strategic Goals



**Advance rigorous research** that is relevant to the health of women



**Develop methods and leverage data sources** that consider sex and gender



**Enhance dissemination and implementation** of evidence to improve the health of women



**Promote training and careers** to advance science for the health of women



**Improve evaluation of research** that is relevant to the health of women



**Cardiovascular disease (CVD) is the most common cause of death among women, killing more women than all forms of cancer combined.**

### **WOMEN AND MEN MAY MANIFEST CVD DIFFERENTLY**

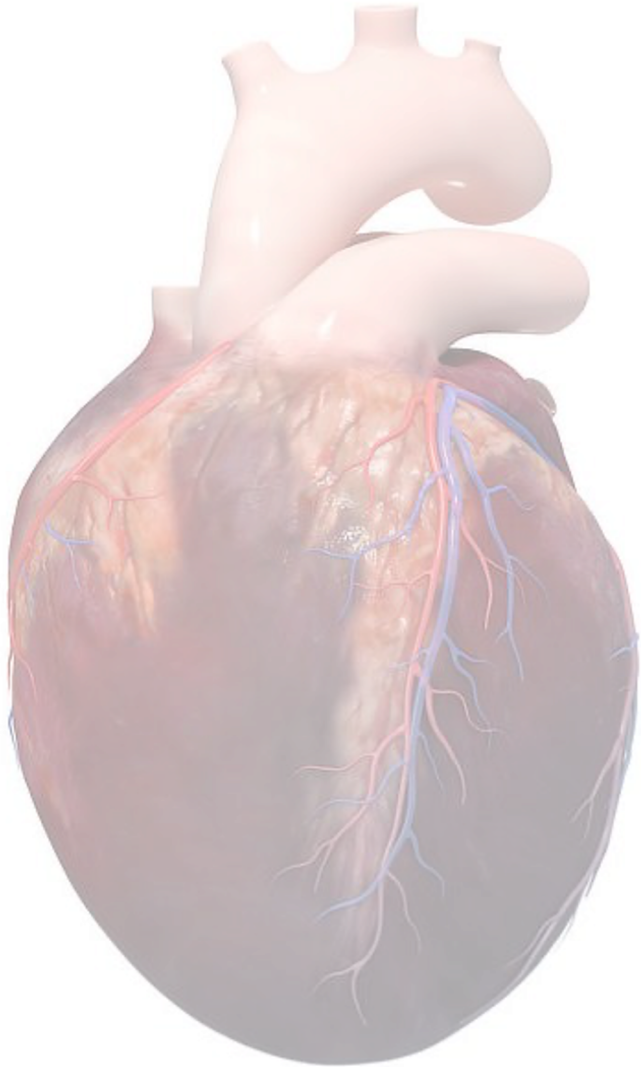
The misconception that women are at lower risk for CVD persists, caused in part by diagnostic and treatment approaches based on studies that did not include enough women—or that were not designed to look at outcomes for women and men separately.

Doctors who care for women may be less attentive to their CVD risk factors than they are with male patients, a recent study found. Women also sensed their concerns were not taken seriously.

(Okunrintemi et al, 2018)

# **HEART DISEASE AND WOMEN**

# Women are less likely to receive appropriate cardiovascular treatment



- Women with myocardial infarction receive less guideline-based diagnosis and less-invasive treatment than men
- Women with atrial fibrillation receive less anticoagulation treatment with warfarin—even so, they have a greater risk for stroke than men
- Women are less likely to receive CPR from EMTs at emergency



# THE U.S. IS THE MOST DANGEROUS PLACE IN THE DEVELOPED WORLD TO DELIVER A BABY.

*USA Today, 2018*



**National Institutes of Health**  
Office of Research on Women's Health

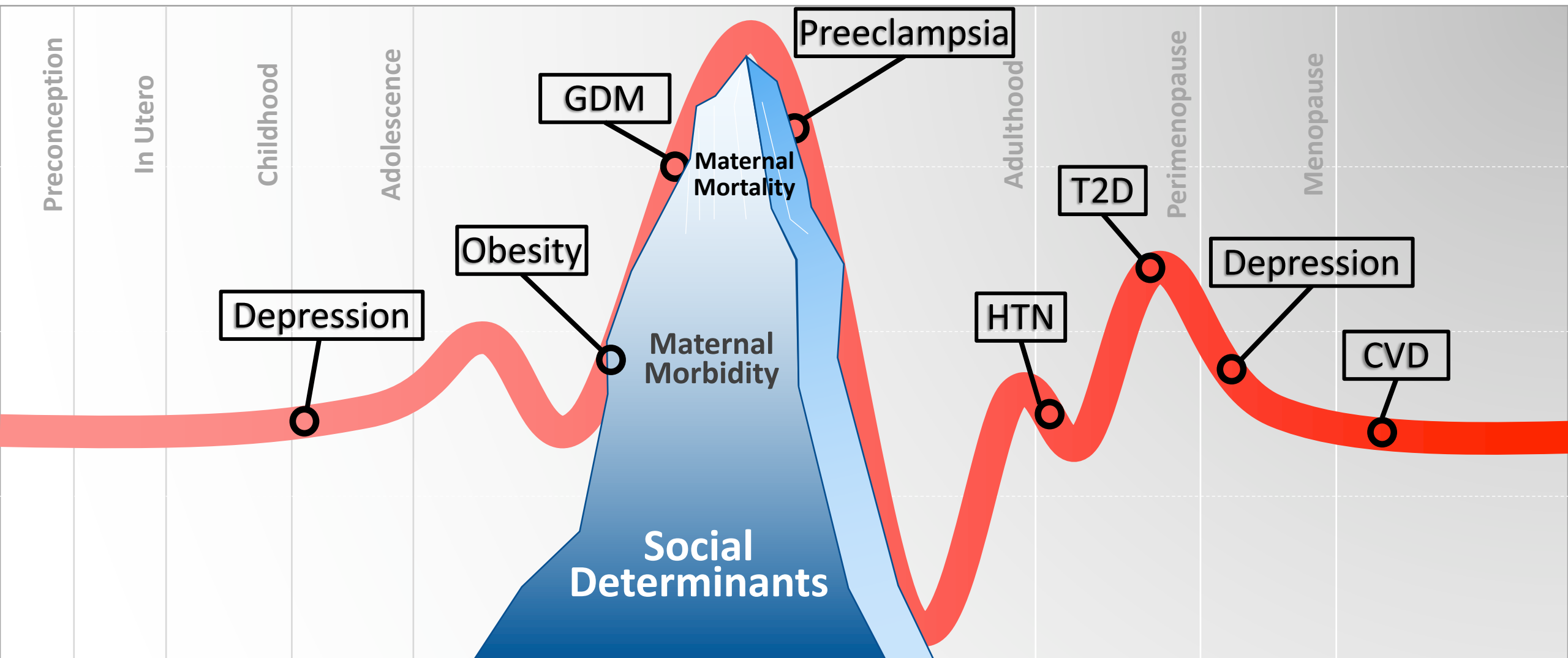




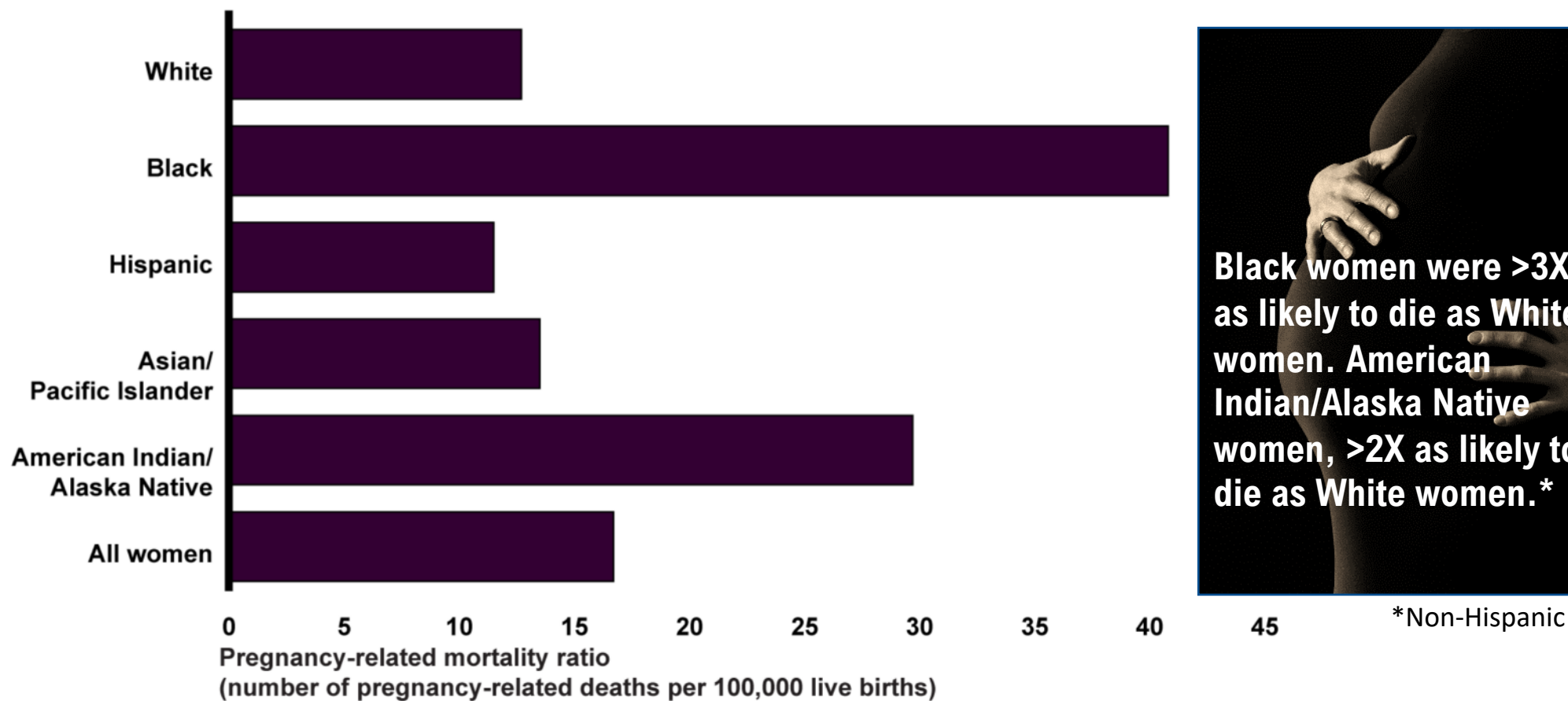
When combined,  
cardiovascular conditions  
were responsible for  
more than 33% of  
pregnancy-related  
deaths.



# Pregnancy is a stress test, and we are failing our mothers



**Figure: Pregnancy-Related Deaths per 100,000 Live Births by Racial/Ethnic Group, 2007-2016**



Source: Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report, September 2019. | GAO-20-248

# Association of Black Cardiologists issues maternal health roundtable report

- On June 13, 2020, the Black Maternal Heart Health Roundtable brought together diverse stakeholders and champions of maternal health equity
- Participants identified current barriers at the community, patient, and clinician level and ways to expand efforts to coordinate an effective approach to reducing these statistics in the highest risk populations
- First comprehensive statement on this important topic—this position paper will generate further research in disparities of care and promote the interest of others to pursue strategies to mitigate maternal mortality.

(Bond et al., 2021)

## Circulation: Cardiovascular Quality and Outcomes

### ORIGINAL ARTICLES

Tracking Cardiac Rehabilitation Participation and Completion Among Medicare Beneficiaries to Inform the Efforts of a National Initiative

Cardiac Rehabilitation Dose Around the World: Variation and Correlates

Utilization of Advanced Cardiovascular Therapies in the United States and Canada: An Observational Study of New York and Ontario Administrative Data

#### Editorial

The Continental (Health Care) Divide

Over-Testing for Suspected Pulmonary Embolism in American Emergency Departments: The Continuing Epidemic

Safety and Outcomes of Intravenous tPA in Acute Ischemic Stroke Patients With Prior Stroke Within 3 Months: Findings From Get With The Guidelines–Stroke

### DATA REPORT

Have the Major Cardiovascular Outcomes Trials Impacted Payer Approval Rates for PCSK9 Inhibitors?

### NOVEL STATISTICAL METHODS

Doubly Robust Estimation of Causal Effect: Upping the Odds of Getting the Right Answers

### PATIENT VIEWPOINT

My Stroke Journey: From Self-Advocacy to Patient Advocacy



[circoutcomes.ahajournals.org](http://circoutcomes.ahajournals.org)



NIH National Institutes of Health  
Office of Research on Women's Health

## Implementing a Maternal health and PRegnancy Outcomes Vision for Everyone

- NIH Maternal Mortality Task Force
- NICHD–OD–ORWH
- ~\$7 Million/FY20
- Focus areas: infection/immunity, mental health, CVD



### PRECONCEPTION CONTRIBUTORS TO SEVERE MATERNAL MORBIDITY IN BLACK AND WHITE WOMEN

*cardiometabolic, inflammatory and social stressors*

Photo by manu mangalassery from Pexels



### PRENATAL BLOOD PRESSURE PATTERNS TO PREDICT PREGNANCY-RELATED HYPERTENSION & LATER LIFE CVD RISK

Photo by Thirdman from Pexels



### EVALUATION OF CARDIAC RISK ASSESSMENT TOOL FOR PREGNANT & POSTPARTUM WOMEN

*updates automatically from medical records, wearable devices, & patient surveys*

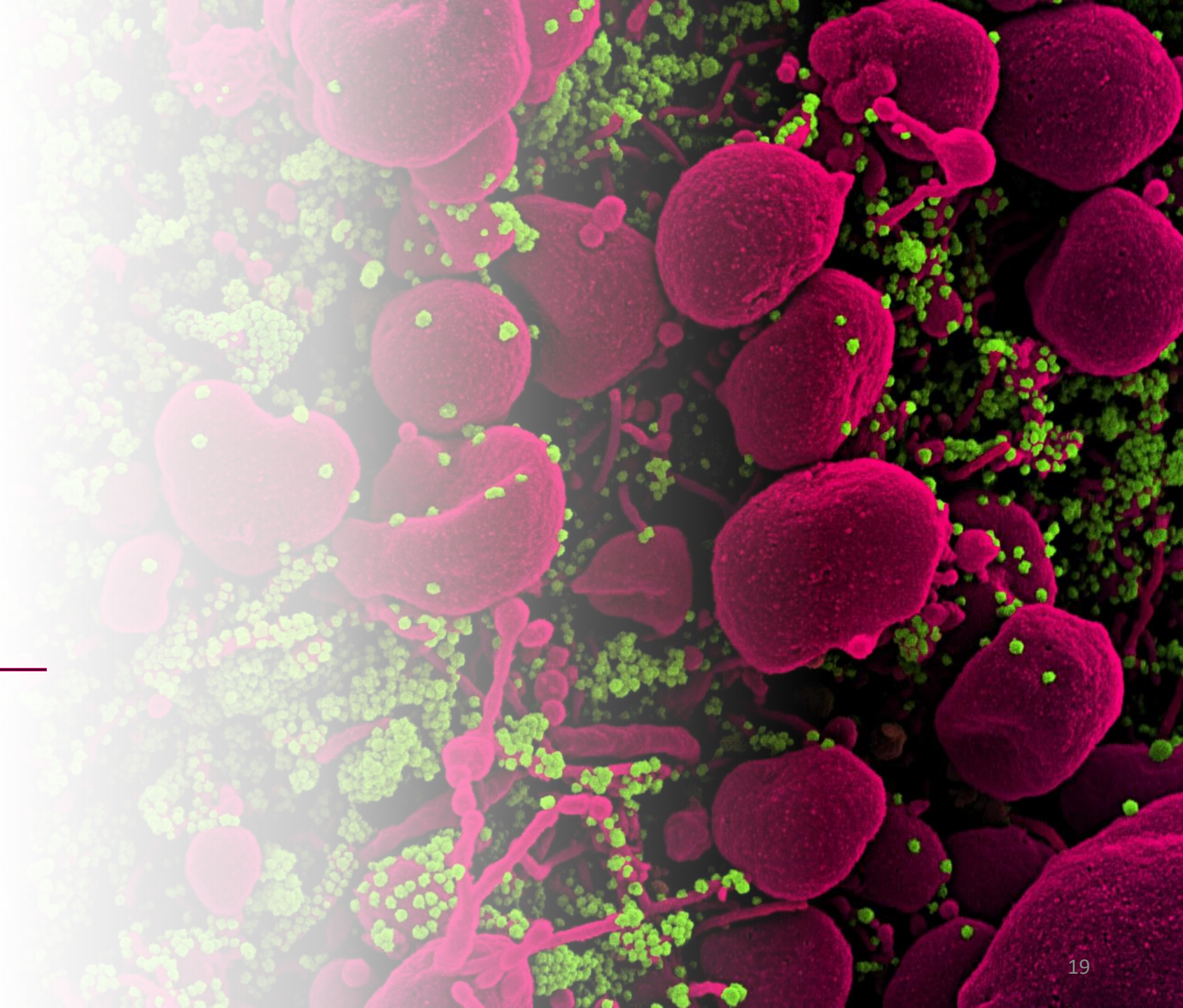
Photo by Ketut Subiyanto from Pexels





# COVID-19 & Women

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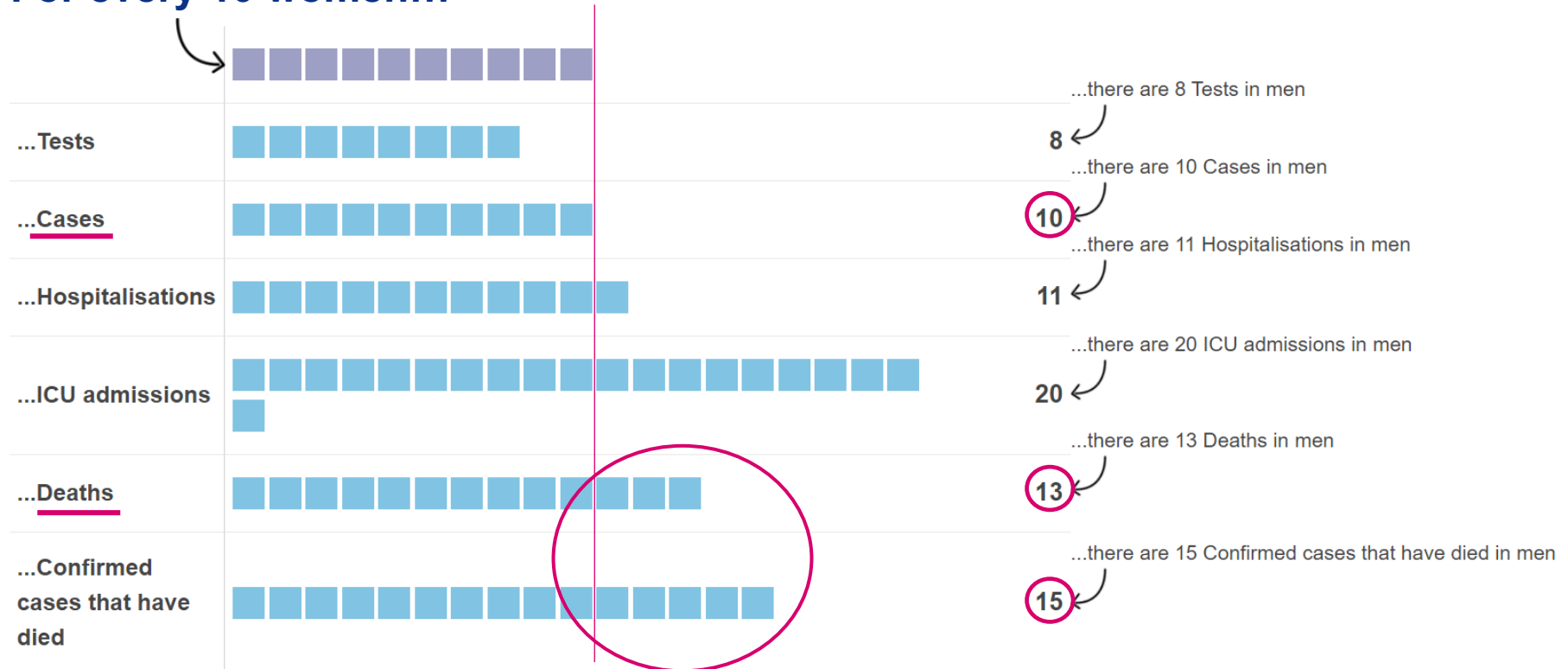


# COVID-19 creates sex and gender disparities, exacerbates others

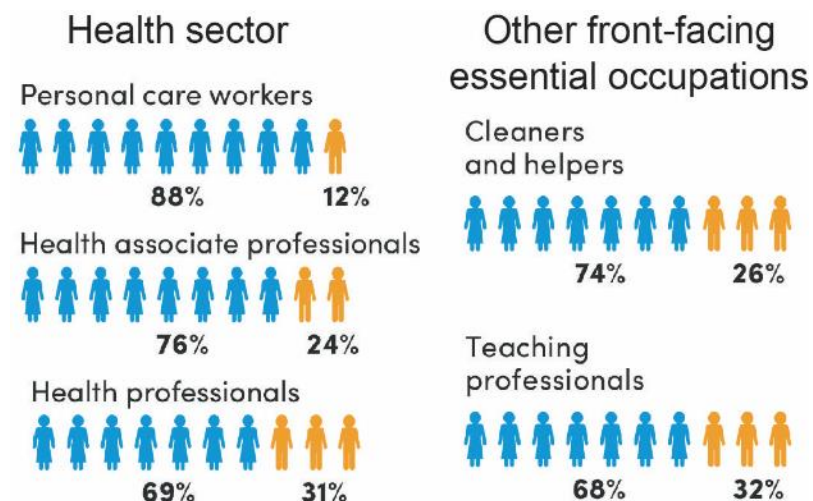
The Sex and Gender and COVI-19 Project

## At the global level, what does the data show?

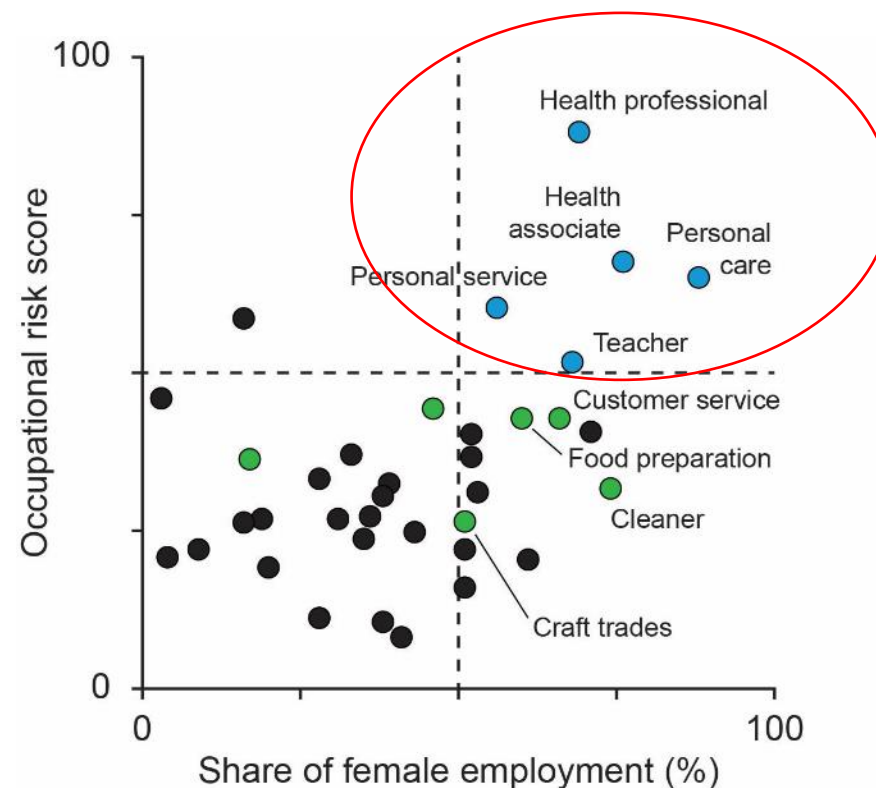
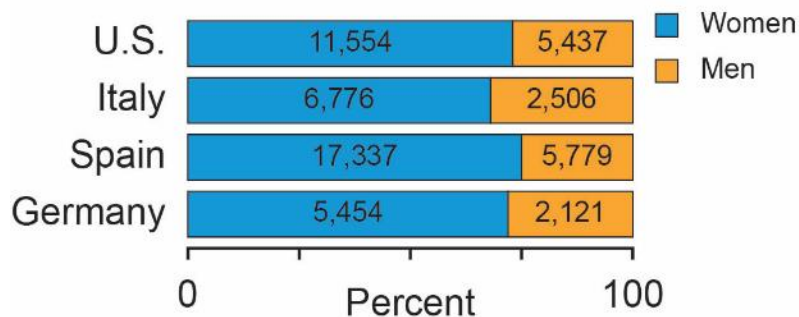
For every 10 women...



# Women are more vulnerable to infection from occupational risk



Confirmed COVID-19 cases among healthcare workers

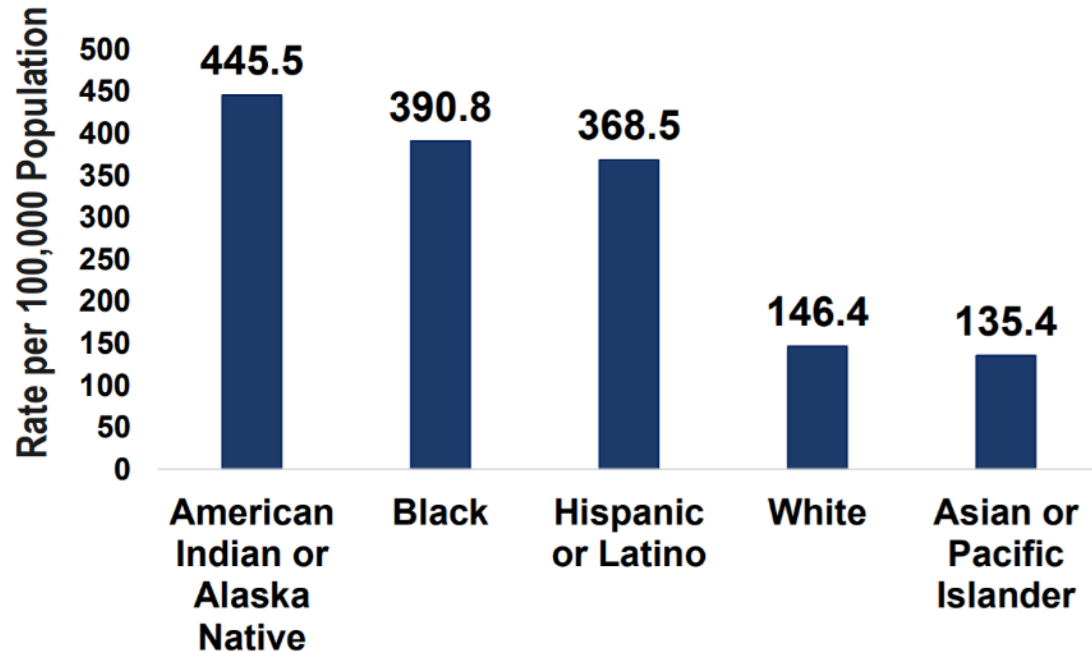


- Highly feminized occupation with high COVID-19 risk
- High risk of job loss



# The COVID-19 Pandemic in the U.S. Disproportionately Affects Communities of Color

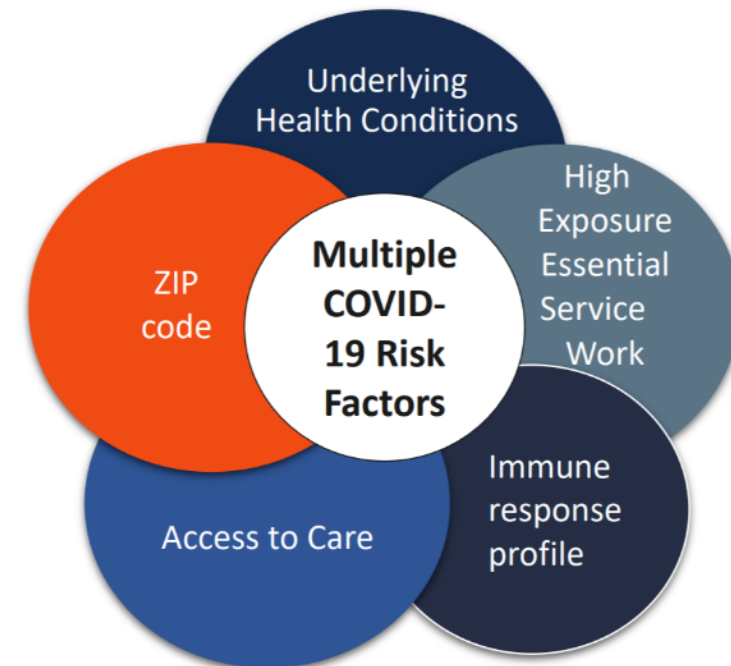
COVID-19-Associated Hospitalization Rates  
March 7–November 21



Among some racial and ethnic minority groups, evidence points to higher rates of hospitalization or death from COVID-19 than among non-Hispanic white persons.

Interplay of clinical characteristics and social determinants of health puts minority communities at high risk for COVID-19 complications

- Heart Disease
- Hypertension
- Diabetes
- Lung Disease



# NIH CEAL Program



**Establish Partnerships  
within the Community**



**Grow an Understanding  
and Trust in Science**



**Accelerate the Uptake  
of Beneficial Treatments**

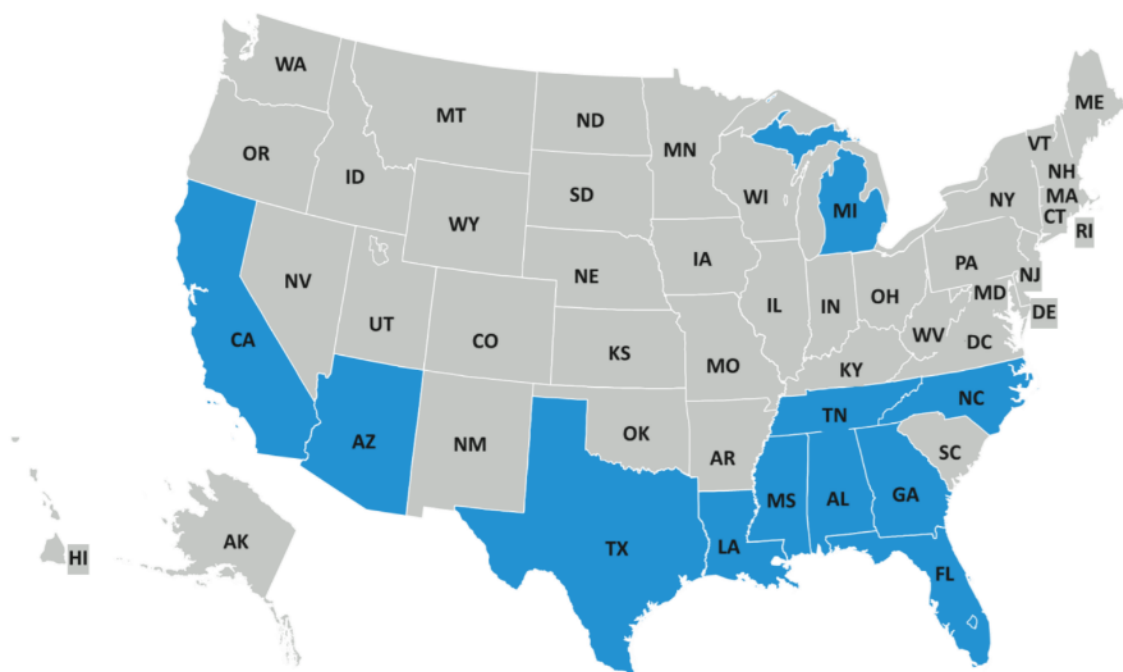


**Address Misinformation  
within Communities of  
Color**

**Trans-NIH initiative leading outreach, engagement and inclusive participation efforts in ethnic and racial minority communities disproportionately affected by the COVID-19 pandemic**

# Fostering, Strengthening and Linking: Unique Partnerships Within Communities

CEAL state team coalitions partner with national and local organizations committed to CEAL's mission



Academic Partners



Community-Based Organizations



Healthcare Centers & Providers



Faith-Based Organizations



State & Local Government Agencies

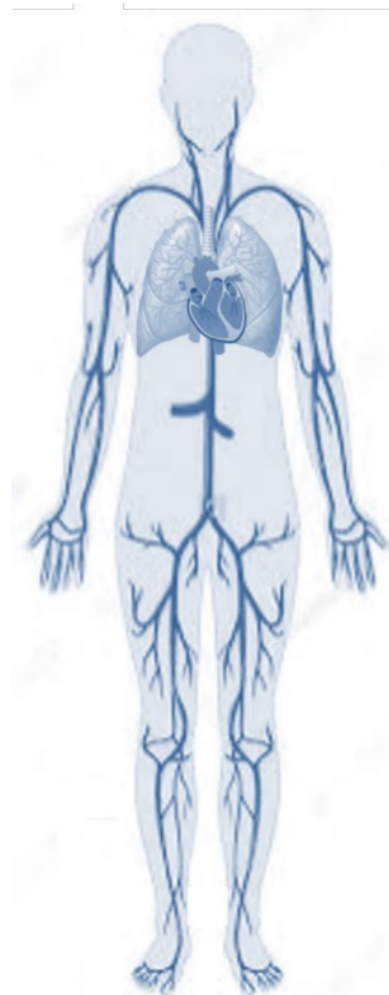


Pharmacy Networks

# COVID-19 Has Severe Effects on the Lung, Heart, Vascular and Blood Coagulation Systems

## What We Know About COVID-19-Associated Coagulopathy (CAC)

- **Blood clots in many** critically ill patients
- 71% of COVID-19 patients who died in China had **systemic coagulopathy**
- **Wide range** of affected patients
- Causing **pulmonary embolism, myocardial infarction, stroke, deep-vein thrombosis**
- Unclear if young people have > CAC rate
- **Increased levels of D-dimer\*** strongly associated with increased mortality
- Microvascular thrombosis (arterial/venous)
- Compromised oxygenation and **multi-organ failure**



**Currently no clear standard-of-care for anticoagulation in hospitalized COVID-19 patients**

Urgent need for clinical evidence to guide practice



Gary H. Gibbons, M.D.  
Director

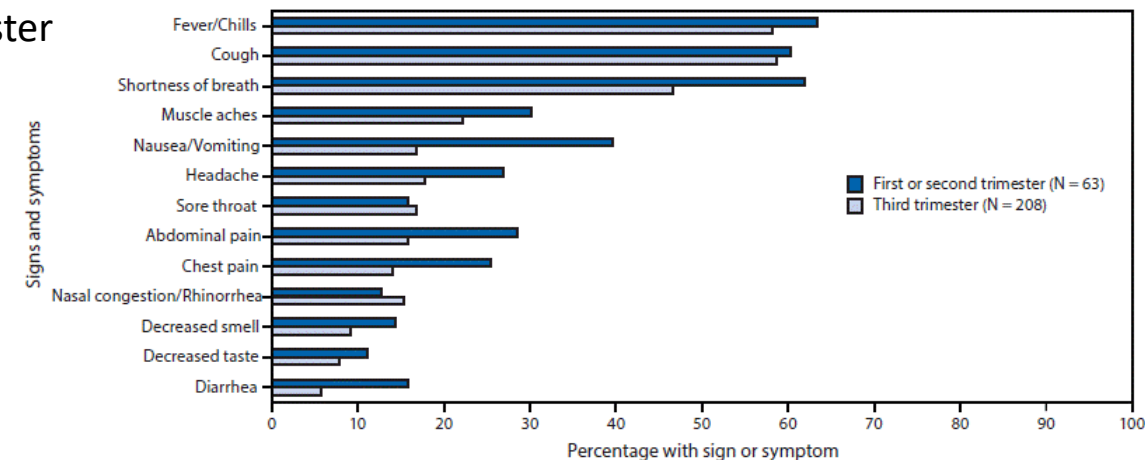
\*biomarker elevated in conditions associated with thrombosis

# Clinical characteristics of pregnant women with COVID-19

## CDC Morbidity and Mortality Weekly Report

Survey of hospitalized, pregnant women in 14 states (3/1 – 8/22)

- 26.5% (598/2255) of hospitalized women aged 15-49 with COVID-19 were pregnant.
- Among the COVID-19 positive and pregnant patients
  - 45.5% were symptomatic at admission
    - Most common: Fever chills, cough, shortness of breath
  - 42.5% Hispanic, 26.5% Black, 16.8% White, 12.5% Asian/Pacific Islander
  - 2.3% were in 1<sup>st</sup> trimester, 10.2% in 2<sup>nd</sup> trimester, 87.4% in 3<sup>rd</sup> trimester
    - 1<sup>st</sup>/2<sup>nd</sup> trimester: 56.8% admitted for COVID-19-related illness
    - 3<sup>rd</sup> trimester: 81.9% admitted for obstetric indications, including labor/delivery
- Among symptomatic COVID-19 patients who were pregnant (n = 272)
  - 16.2% admitted to ICU, 8.5% required mechanical ventilation
  - 0.7% mortality (2 deaths)



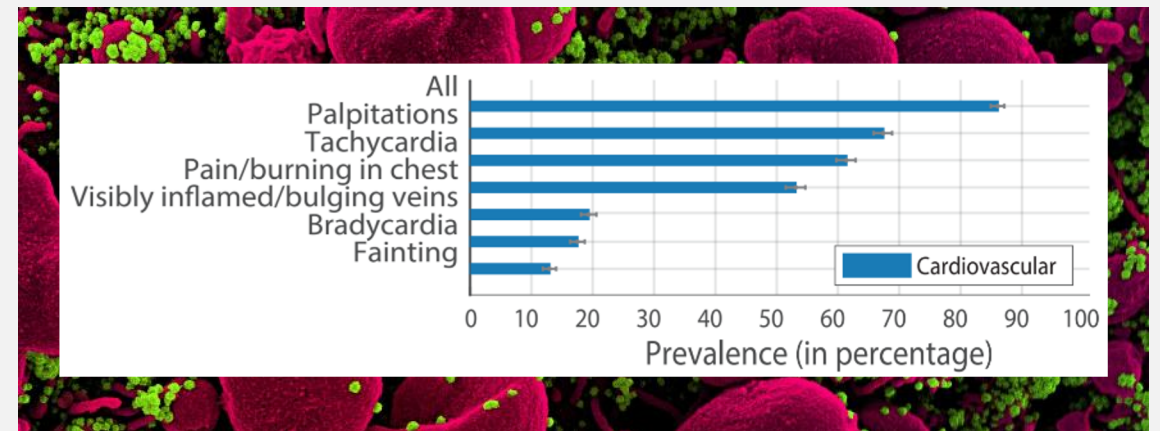


# Long COVID syndrome studies show prevalence, severity, sex effects

Long COVID syndrome is clinically known as *post-acute sequelae of COVID-19 (PASC)*

## Patient-Led Research for COVID-19

- >3,700 self-described “Long Haulers” – 78% women in 56 countries
- >200 symptoms over time, inc. those affecting:
  - **heart**, lungs, GI system, muscles, joints
  - neurological and neuropsychiatric
- **2,464 reported symptoms (avg of 14) lasting 6 months or longer**
  - **Most common:** fatigue, worsening of symptoms after physical or mental activity, shortness of breath, trouble sleeping, and “brain fog”
- 88% had cognitive dysfunction or memory loss; nearly half couldn’t work FT 6 months after developing PASC



# Long COVID syndrome studies show prevalence, severity, sex effects

## The Lancet

- Ambidirectional cohort study of COVID-19 patients hospitalized at Wuhan hospital (1/7/20 – 5/29/20)
  - Patients' median age was 57 and **48% were women**
- Most common comorbidities: hypertension (29%), diabetes (12%), and **CVD (7%)**
- Men are larger percentage of participants with higher severity: **64% for scale 5–6**
- >75% continued to report at least 1 symptom 6 months after onset – **Higher percentage were women**
- Most common symptoms:
  - Fatigue or muscle weakness (63%)
  - Sleep difficulties (26%)
  - Anxiety or depression (23%) – **more common in women**
- >50% had significant persistent lung abnormalities (more common in those who'd been more severely ill)
- Patients at scale 5–6 showed an Odds Ratio (OR) of 4.60 for diffusion impairment; OR 1.77 for anxiety or depression; OR 2.69 for fatigue or muscle weakness, compared with participants at scale 3
  - Women had an OR 2.22 for diffusion impairment, OR 1.80 for anxiety or depression, and OR 1.33 for fatigue or muscle weakness compared with men

THE LANCET

## Lancet article highlights sex/gender-related psychological effects

“We found that **being a woman** and severity of illness were risk factors for persistent psychological symptoms. **Female SARS survivors had higher stress levels and higher levels of depression and anxiety**. In a 3-month follow-up survey of 538 COVID-19 patients, Xiong and colleagues found that physical decline or fatigue, postactivity polypnoea, and alopecia were **more common in women** than in men. The underlying mechanism of the psychiatric consequences of COVID-19 is likely to be multifactorial and might include the direct effects of viral infection, the immunological response, corticosteroid therapy, ICU stay, social isolation, and stigma.”

(Huang et al., 2021)





## 2019 *Women's Health Issues* article highlights need for sex & gender research

- Percentage of women veterans projected to grow from 10% (2019) to 15% (2035)
- Quality medical care stems from consideration of military-related health needs and influence of sex & gender on health
- **Examples.** Research that integrated influence of sex/gender found women are:
  - Affected by combat stress & exposure differently than men
  - Require different ergonomic designs for equipment
  - Experience pain and respond to drugs differently
  - Have different immune function
- Gender roles are also a factor: e.g., association with higher rates of cardiac disease
- Our understanding of sex/gender differences will not advance unless data for men and women are analyzed and reported

# ORWH's e-learning educates biomedical community on sex & gender

## ■ Bench to Bedside: Integrating Sex & Gender to Improve Human Health

Immunology | CVD | Pulmonary Disease | Neurology | Endocrinology | Mental Health

## ■ Sex as a Biological Variable Primer

- With support from  National Institute of General Medical Sciences

## ■ Introduction to the Scientific Basis of Sex- and Gender-Related Differences | Including facilitator's guide





# ORWH Resources and Future Events

- **New “Diverse Voices: COVID-19 and the Health of Women” series (1/27/21)**

*Sex and Gender Disparities in the COVID-19 Pandemic*  
<https://orwh.od.nih.gov/about/newsroom/events/sex-and-gender-disparities-covid-19-pandemic-webinar>

- **ORWH’s COVID-19 Webpage**

*Women, Science, and the Impact of COVID-19*  
<https://orwh.od.nih.gov/sex-gender/covid-19>

April 14, 2021

**Advisory Committee on Research on Women’s Health | Virtual**

May 11-12, 2021

**5<sup>th</sup> NIH Vivian W. Pinn Symposium | Virtual**

*Integrating Sex and Gender Into Biomedical Research as a Path for Better Science and Innovation*

June 24, 2021

**Diverse Voices: COVID-19 & the Health of Women | Virtual**

*Tonia Poteat, Ph.D., PA-C, M.P.H., and Lisa Bowleg, Ph.D., M.A., discuss the application of intersectionality to the COVID-19 pandemic.*

# WOMEN'S HEALTH *In Focus* AT NIH



**30<sup>TH</sup> ANNIVERSARY ISSUES**

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## The Pulse

**ORWH's monthly email | [bit.ly/ORWHpulse](https://bit.ly/ORWHpulse)**

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Office of Research on Women's Health

# Promoting Cardiovascular Health in Women

Gina S. Wei, MD, MPH

Associate Director for Prevention and Population Sciences  
Division of Cardiovascular Sciences  
National Heart, Lung, and Blood Institute

*Presentation for the Defense Health Agency*

February 21, 2021





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# Objectives

1. Importance of promoting cardiovascular health in women
2. Special considerations in pregnancy and beyond
3. Post-menopausal cardiovascular health

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1. Importance of promoting cardiovascular health in women
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## The Heart Truth®

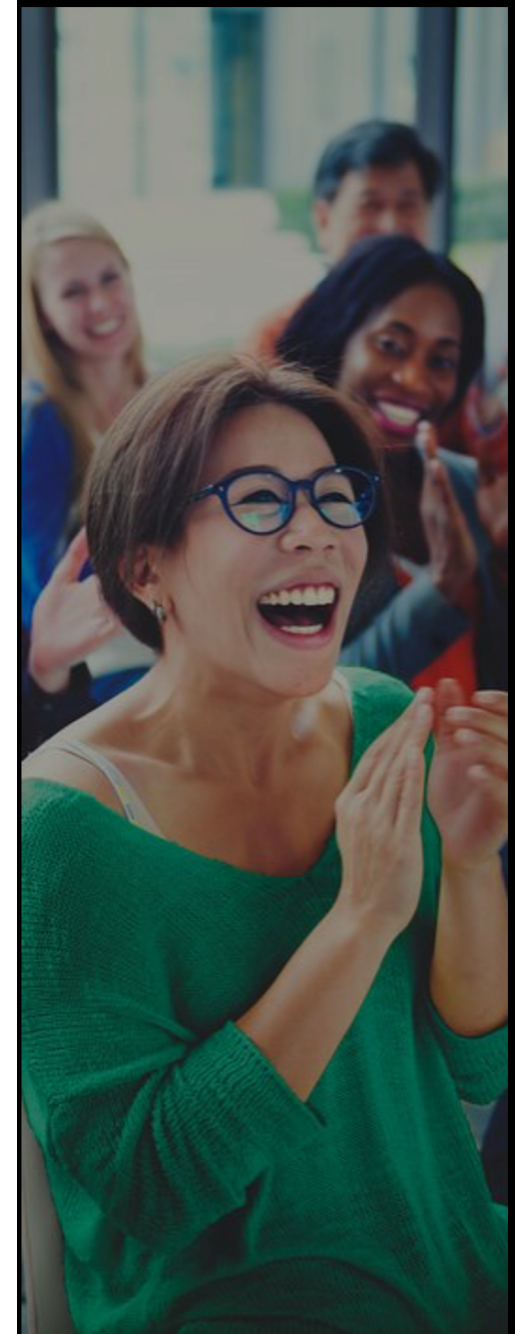
Heart disease is the leading cause of death in the United States. But you can do a lot to protect your heart.

• **Women**

- 1 in 5 women die of heart disease
- 45% of women are still unaware that heart disease is #1 killer of women
- Heart disease is more prevalent in African American women than White women
- 26% of women find heart disease embarrassing, assuming their risk is solely linked to weight (need to de-stigmatize the disease risk by countering with facts)
- Heart attacks are becoming more common in younger women



(NHLBI, n.d.; Merz, et al., 2017; Arora et al., 2019)





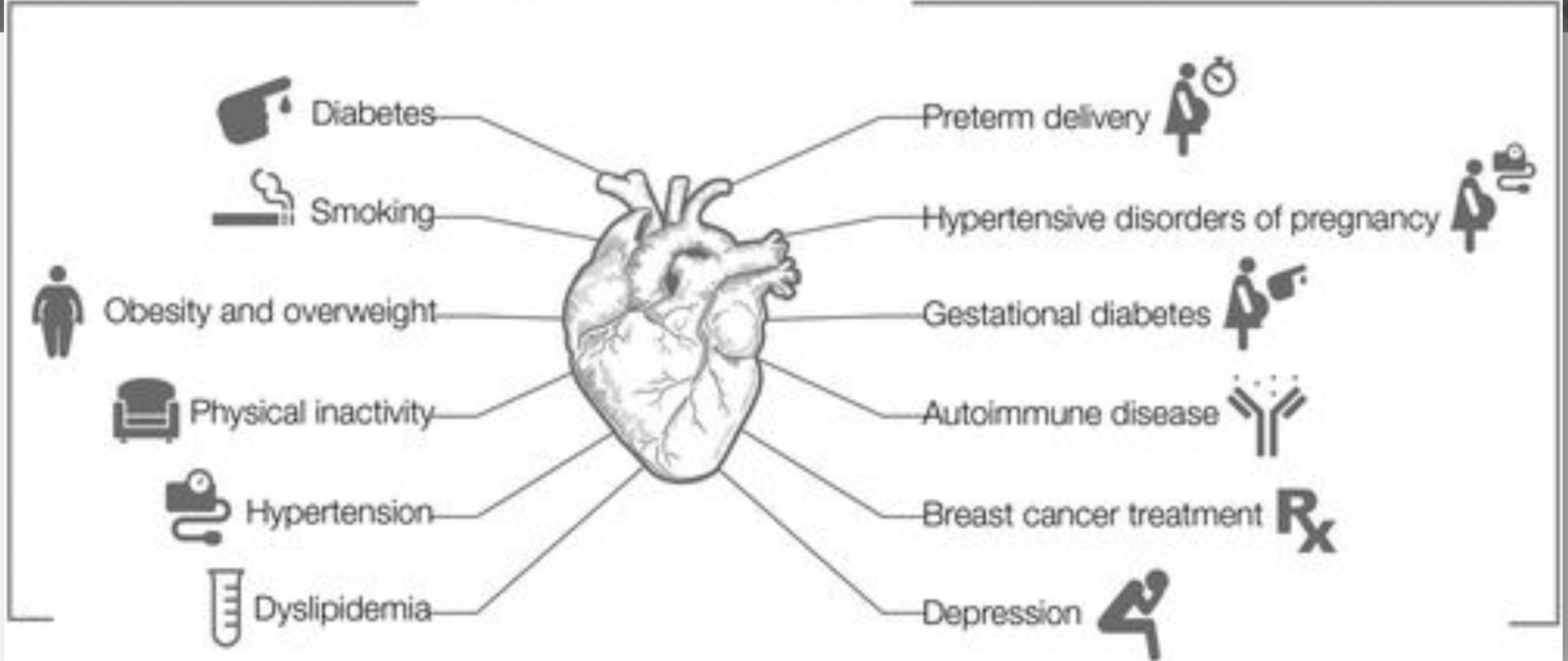
# The Heart Truth<sup>®</sup> Program Objectives

- **Increase awareness of the risk factors for heart disease.**
  - ex., *"I know that being overweight puts me at risk for heart disease."*
- **Increase awareness of the specific health goals to control risk factors .**
  - ex., *"I know I need to get my BMI between 18.5 and 24 to control my risk of heart disease."*
- **Increase at risk-populations self-efficacy to prevent heart disease and/or control its risk factors.**
  - ex., *"Because I have access to information and tools, I believe I am capable of taking steps to lose weight to control my risk of heart disease."*
- **Increase the number of Americans who intend to take action to prevent heart disease and/or control its risk factors.**
  - ex., *"I have a plan of action and will start today to take the steps needed to lose weight to control my risk of heart disease."*



## Traditional ASCVD Risk Factors

## Emerging, Nontraditional ASCVD Risk Factors



ASCVD = Atherosclerotic Cardiovascular Disease



(Garcia et al., 2016)

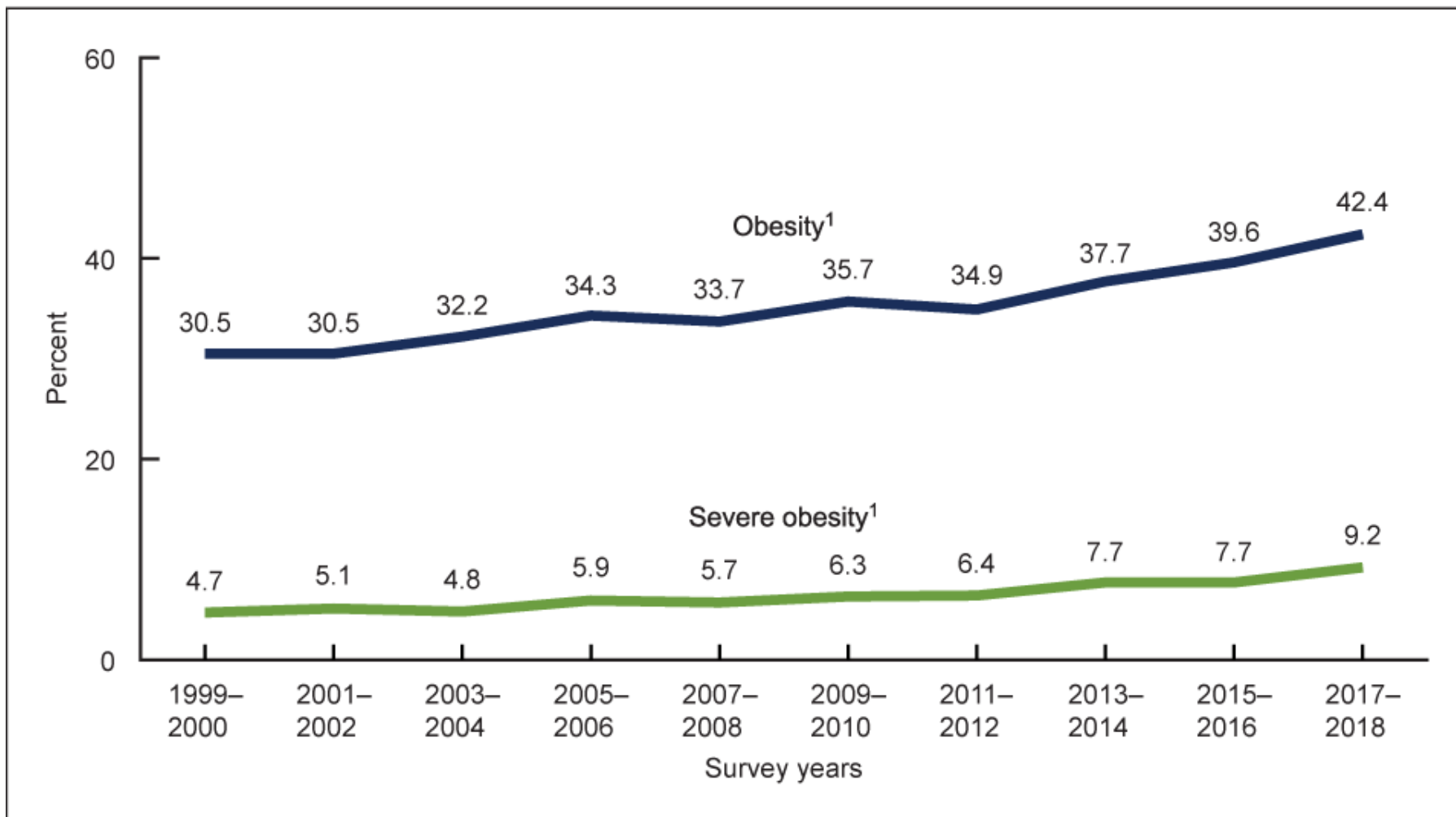


National Heart, Lung,  
and Blood Institute

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# Rising Rates of Obesity in U.S. Adults

Figure 4. Trends in age-adjusted obesity and severe obesity prevalence among adults aged 20 and over: United States, 1999–2000 through 2017–2018



(Additional Data not shown)

- The overall prevalence of **obesity** was similar among men and women
- But the prevalence of **severe obesity** was **higher among women**

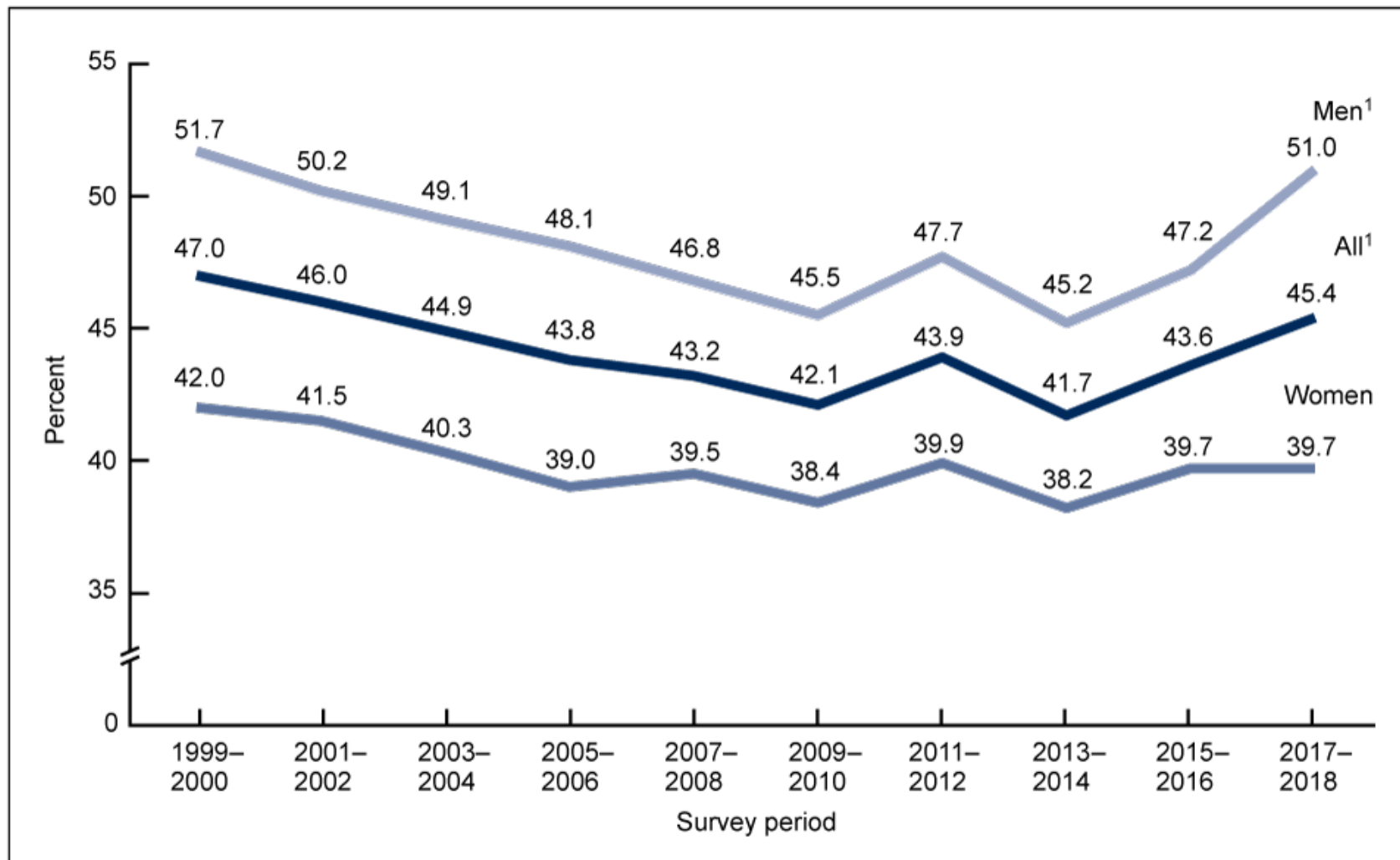
<sup>1</sup>Significant linear trend.

NOTES: Estimates were age adjusted by the direct method to the 2000 U.S. Census population using the age groups 20–39, 40–59, and 60 and over. Access data table for Figure 4 at: [https://www.cdc.gov/nchs/data/databriefs/db360\\_tables-508.pdf#4](https://www.cdc.gov/nchs/data/databriefs/db360_tables-508.pdf#4).

SOURCE: NCHS, National Health and Nutrition Examination Survey, 1999–2018.

# High Rates of Hypertension in U.S.

Figure 4. Age-adjusted trend in hypertension prevalence among adults aged 18 and over, by sex: United States, 1999–2018



Although, unlike men, age-adjusted **hypertension prevalence** for **women** did not significantly change from 1999–2000, the prevalence is still high, at **39.7%**.

<sup>1</sup>Significant quadratic trend from 1999 through 2018.

NOTES: Hypertension is defined as systolic blood pressure greater than or equal to 130 mmHg or diastolic blood pressure greater than or equal to 80 mmHg, or currently taking medication to lower blood pressure. All estimates are age adjusted by the direct method to the U.S. Census 2000 population using age groups 18–39, 40–59, and 60 and over. Access data table for Figure 4 at: <https://www.cdc.gov/nchs/data/databriefs/db364-tables-508.pdf#4>.

SOURCE: NCHS, National Health and Nutrition Examination Survey, 1999–2018.



National Heart, Lung,  
and Blood Institute



# American Heart Association (AHA) Life's Simple 7 – Online Tools Available



My Heart Score



1. Manage Blood Pressure
2. Control Cholesterol
3. Reduce Blood Sugar
4. Eat Better
5. Lose Weight
6. Get Active
7. Stop Smoking

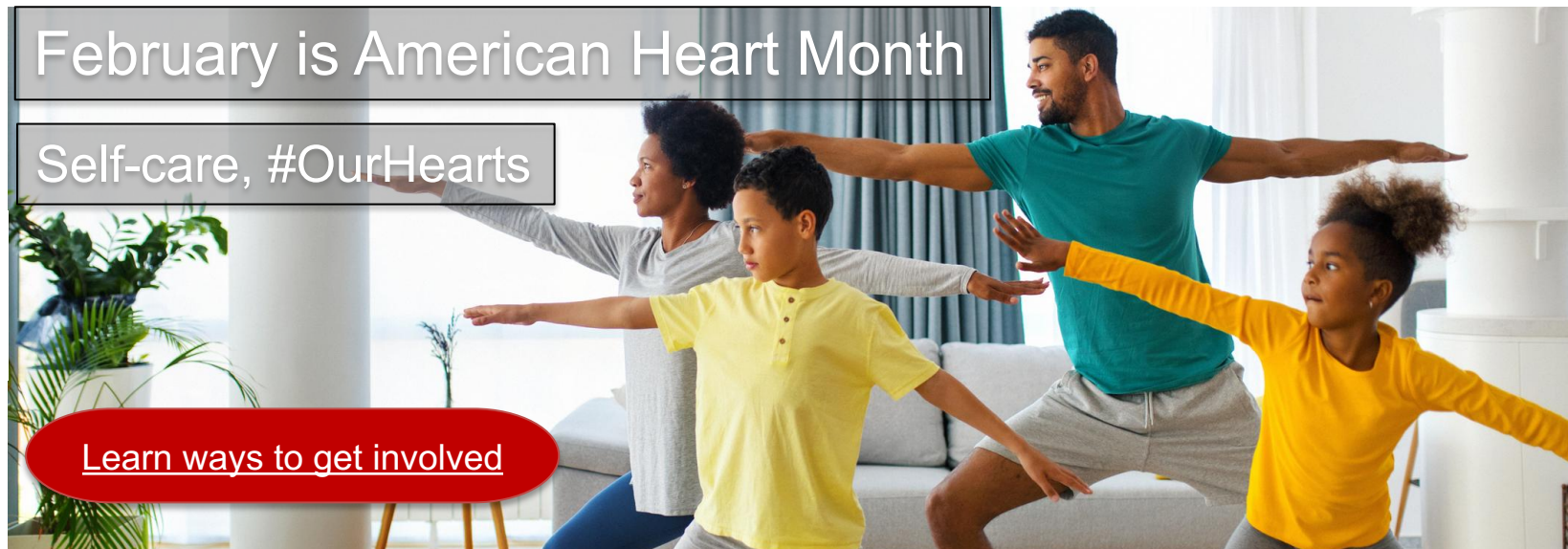


# NHLBI Educational Programs and Toolkits to Promote Heart Healthy Living

February is American Heart Month

Self-care, #OurHearts

[Learn ways to get involved](#)



The Heart Truth®

Protect your heart from the  
leading cause of death in U.S.

[Learn ways to get involved](#)



# New U.S. Preventive Services Task Force (USPSTF) Guidelines

## Healthy Diet and Physical Activity for Cardiovascular Disease Prevention in Adults With Cardiovascular Risk Factors: Behavioral Counseling Interventions ([link](#))

November 24, 2020



Population	Recommendation	<a href="#">Grade</a>
Adults with cardiovascular disease risk factors	The USPSTF recommends offering or referring adults with cardiovascular disease risk factors to behavioral counseling interventions to promote a healthy diet and physical activity.	<b>B</b>



## Interventions for Tobacco Smoking Cessation in Adults, Including Pregnant Persons ([link](#))

January 19, 2021



Population	Recommendation	<a href="#">Grade</a>
Nonpregnant adults	The USPSTF recommends that clinicians ask all adults about tobacco use, advise them to stop using tobacco, and provide behavioral interventions and FDA-approved pharmacotherapy for cessation to nonpregnant adults who use tobacco.	<b>A</b>
Pregnant persons	The USPSTF recommends that clinicians ask all pregnant persons about tobacco use, advise them to stop using tobacco, and provide behavioral interventions for cessation to pregnant persons who use tobacco.	<b>A</b>
Pregnant persons	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of pharmacotherapy interventions for tobacco cessation in pregnant persons.	<b>I</b>
All adults	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of electronic cigarettes (e-cigarettes) for tobacco cessation in adults, including pregnant persons...	<b>I</b>





## Million Hearts® 2022

- A national initiative co-led by the CDC and CMS to prevent 1 million heart attacks and strokes within 5 years
- Focuses on implementing a small set of evidence-based priorities and targets that can improve cardiovascular health for all

A screenshot of the Million Hearts website. The header is dark red with the Million Hearts logo and a search bar. Below the header is a navigation bar with links: Home, Tools &amp; Protocols, Data &amp; Reports, Partners &amp; Progress, and Learn &amp; Prevent. The main content area features a large image of an "EMERGENCY" sign on a building at night. To the right of the image is a text box stating: "During the early months of the COVID-19 pandemic, emergency department visits increased by 20%. Use these tools to get people into the emergency department on time." with a "Learn more" button. Below this is a section with an information icon and text: "Share resources for the 2020-2021 flu season. See CDC's Information for Health Professionals page for flu guidance and tools." The "Million Hearts® 2022" section follows, with a brief description of the initiative. Below this are three columns: "Priority Topics" (COVID-19, Cholesterol Management, Tobacco Use), "Clinical Tools" (Hypertension Control Change Package, Second Edition; Tobacco Cessation Change Package; Cardiac Rehabilitation Change Package), and "Featured Resources" (a purple box with the U.S. Public Health Service seal and the text "Do This! Read The Surgeon General's Call to Action to").

<https://millionhearts.hhs.gov/index.html>



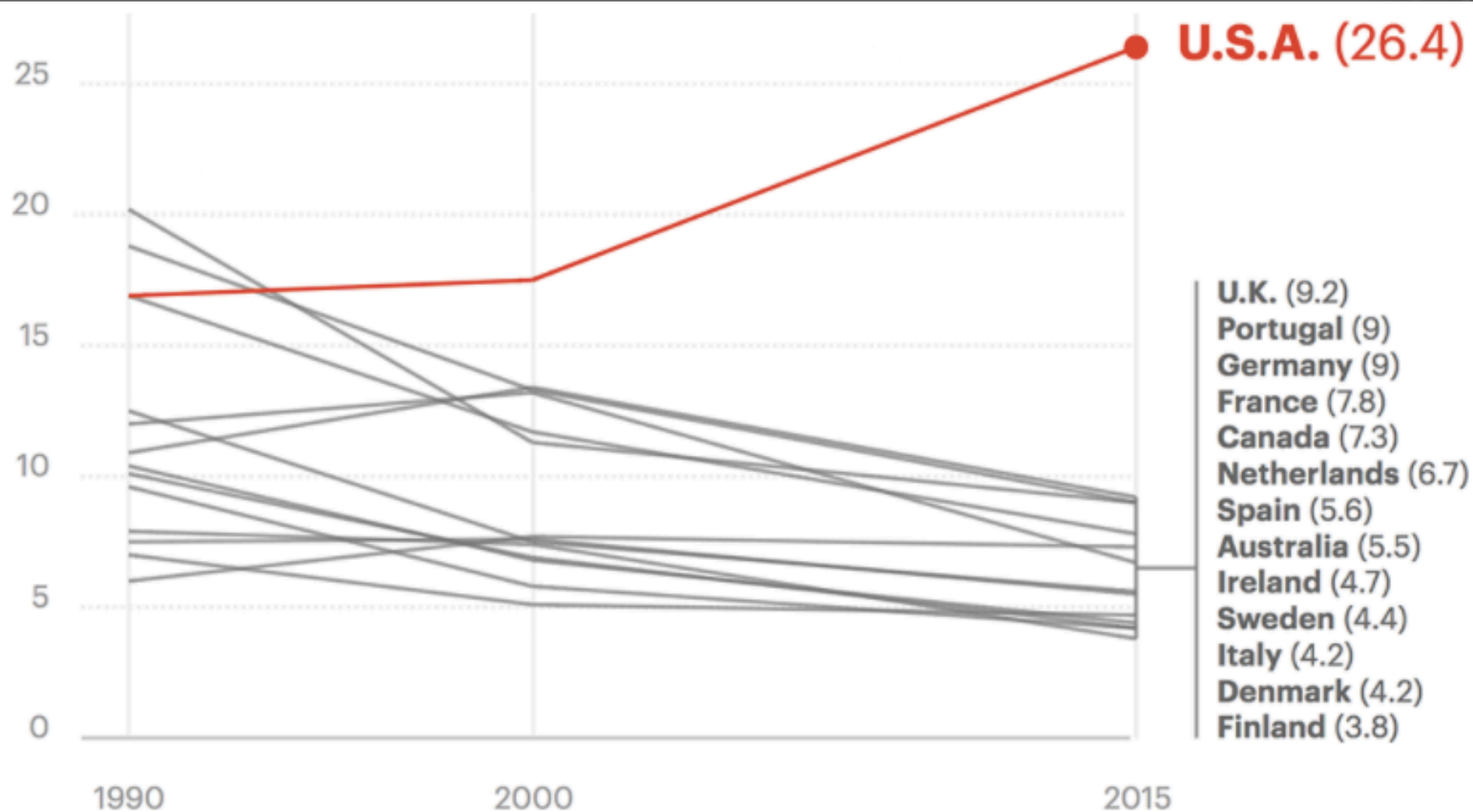
# Outline

1. Importance of promoting cardiovascular health in women
- 2. Special considerations in pregnancy and beyond**
3. Post-menopausal cardiovascular health



<https://www.nhlbi.nih.gov/>

# Global Trends in Maternal Mortality, 1990-2015



Deaths per 100,000 live births in the United States Compared with Other High-Income Countries, 1990-2015

*Vital Signs:* Pregnancy-Related Deaths, United States, 2011–2015, and Strategies for Prevention, 13 States, 2013–2017

- ~ 700 women die annually from pregnancy-related complications
- Cardiovascular conditions responsible for >33% of these deaths
- Leading causes of death varied by timing relative to the end of pregnancy
- Black and American Indian/Alaska Native women had 3.3- and 2.5-times higher mortality rates, respectively, than white women
- ~ 3 in 5 pregnancy-related deaths were preventable – contributing factors: *community, health facility, patient, provider, and system levels*

# U.S. Department of Health and Human Services Action Plan and the Surgeon General's Call to Action for Maternal Health

**4 KEY GOALS** emphasize a life course perspective to improve maternal and infant health outcomes.



## **POSTPARTUM**

maintain ongoing touch points for women with medical and social service providers to ensure warning signs are identified and addressed, and by providing accessible information on parenting skills, self-esteem building and stress management, as well as other family supports



### **GOAL 1**

Healthy Outcomes for All Women of Reproductive Age



### **GOAL 2**

Healthy Pregnancies and Births



### **GOAL 3**

Healthy Futures



### **GOAL 4**

Improve Data and Bolster Research



## **DURING PREGNANCY**

continue prevention efforts into pregnancy to prevent or mitigate the development of complications



## **PRE-PREGNANCY**

perform recommended screenings and treat all young girls, adolescents, and women for a variety of health risk factors

**3 TARGETS** to improve maternal health outcomes



Reduce maternal mortality rate by 50% in 5 years.



Reduce low-risk cesarean delivery rate by 25% in 5 years.



Achieve blood pressure control in 80% of women of reproductive age with hypertension in 5 years.



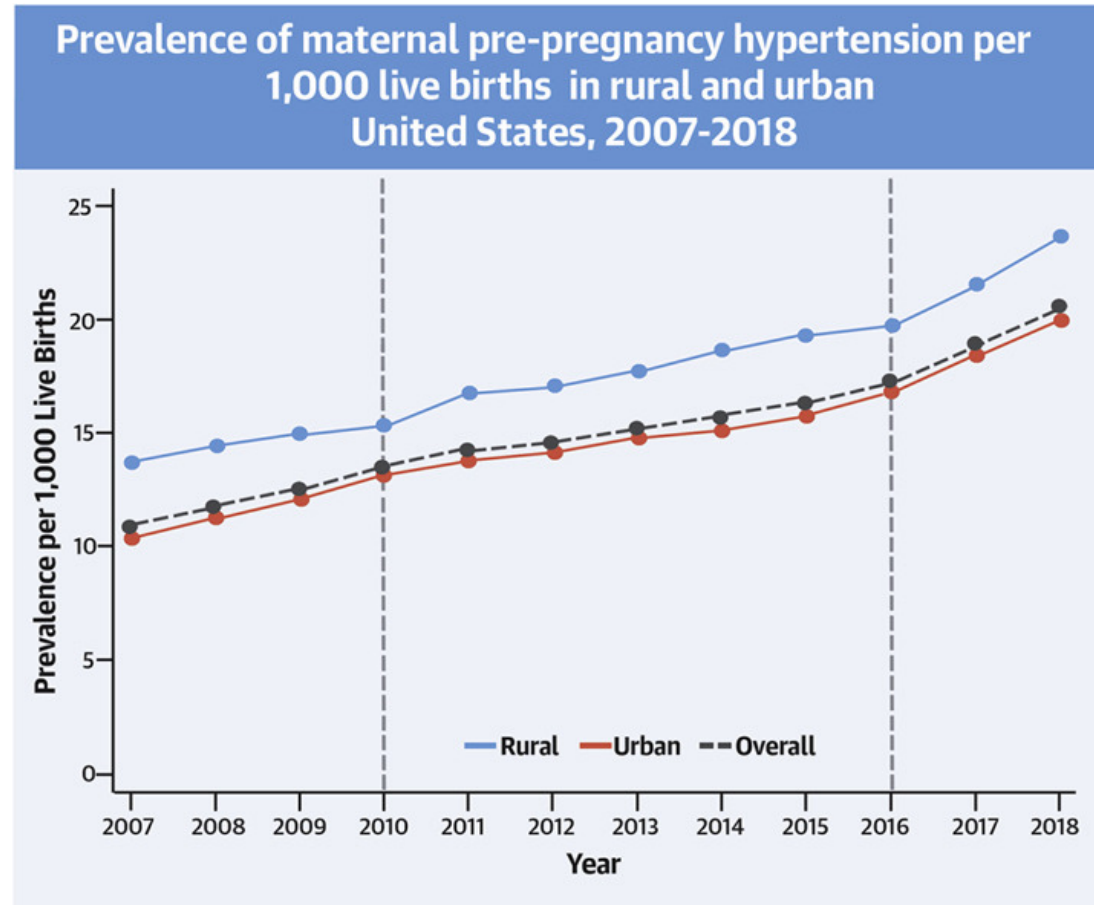
<https://www.womenshealth.gov>



**NIH** National Institutes of Health  
Office of Research on Women's Health



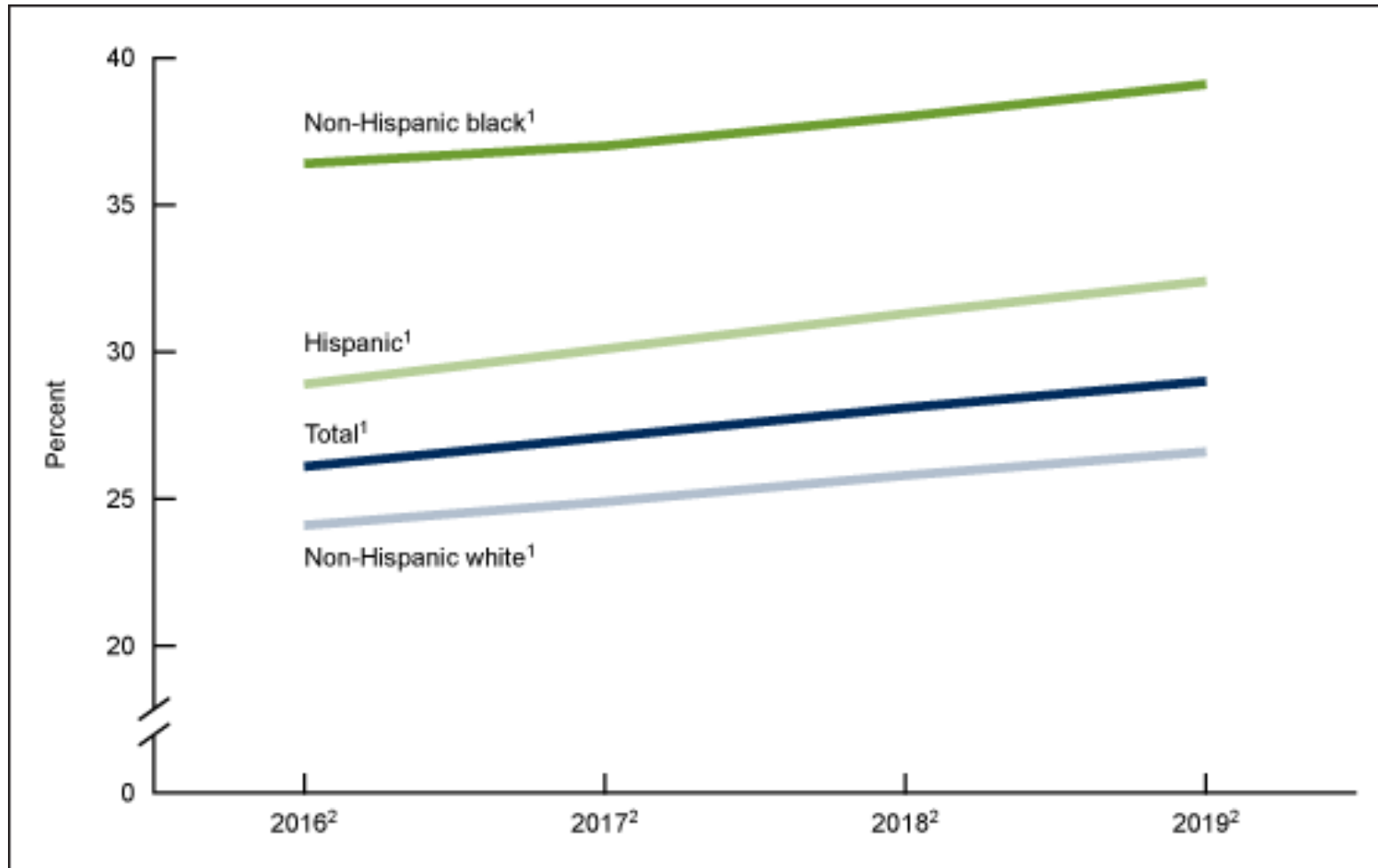
# An Opportunity for Upstream Prevention – Prepregnancy Hypertension



- Rates of **prepregnancy** hypertension nearly doubled (10.9 to 20.5) from 2007-2018
- Rural gap persisted

Note: does not capture undiagnosed hypertension, so actual rates would be higher

# Another Opportunity for Upstream Prevention – Prepregnancy Obesity



**Prepregnancy obesity** in the U.S. rose overall and for Black, Hispanic, and White Women from 2016 through 2019

# Optimizing Cardiovascular (CV) Health in Early Pregnancy – A Recent Publication

- A prospective Dutch population-based study showed **better CV health** in early pregnancy associated with better CV health (**smaller carotid intimal thickness**) 10 years later
- **CV health** in pregnancy based on **5 metrics**: blood pressure, total-cholesterol, glucose, smoking, and body mass index



(Benschop et al., 2019)



# Prenatal Care Guidelines that Impact Maternal Cardiovascular Health

## Preeclampsia: Screening ([link](#))

April 25, 2017

Population	Recommendation	<a href="#">Grade</a>
Pregnant woman	The USPSTF recommends screening for preeclampsia in pregnant women with blood pressure measurements throughout pregnancy.	<b>B</b>



## Gestational Diabetes Mellitus, Screening ([link](#))

January 14, 2014

Population	Recommendation	<a href="#">Grade</a>
Asymptomatic Pregnant Women, After 24 Weeks of Gestation	The USPSTF recommends screening for gestational diabetes mellitus (GDM) in asymptomatic pregnant women after 24 weeks of gestation.	<b>B</b>

## Low-Dose Aspirin Use for the Prevention of Morbidity and Mortality From Preeclampsia: Preventive Medication ([link](#))

September 09, 2014

Population	Recommendation	<a href="#">Grade</a>
Pregnant Women Who Are At High Risk for Preeclampsia	The USPSTF recommends the use of low-dose aspirin (81 mg/d) as preventive medication after 12 weeks of gestation in women who are at high risk for preeclampsia.	<b>B</b>



## AHA SCIENTIFIC STATEMENT

# Cardiovascular Considerations in Caring for Pregnant Patients: A Scientific Statement From the American Heart Association

- Cardio-obstetrics team before pregnancy, during pregnancy, and postpartum
- Prepregnancy Counseling
- Medical Conditions During Pregnancy
  - Hypertensive Disorders in Pregnancy
  - Ischemic Heart Disease in Pregnancy
  - Cardiomyopathies in Pregnancy
  - Arrhythmias in Pregnancy
  - Valvular Heart Disease in Pregnancy
  - Aortic Disease and Pregnancy
  - Deep Venous Thrombosis and Pulmonary Embolism in Pregnancy
  - Cerebrovascular Disease in Pregnancy
- Postpartum Follow-Up



# Adverse Pregnancy Outcomes and Higher Risks for Future CVD



**Heart  
Health Study**

Funded by the National Institutes of Health

*is a prospective observational cohort which started in 2013 that has followed 4,508 women after their first pregnancy.*

Finding ([JAHA Sept 30, 2019](#)): Women with **hypertensive disorders of pregnancy**, **preeclampsia**, or had a **preterm birth** had a higher risk of subsequent **incident hypertension after 2-7 years of follow up** (mean 3.2 years),



**The Women's Health Initiative** is a large cohort study of postmenopausal women who were enrolled between 1993 and 1998 and continue to be followed up prospectively.

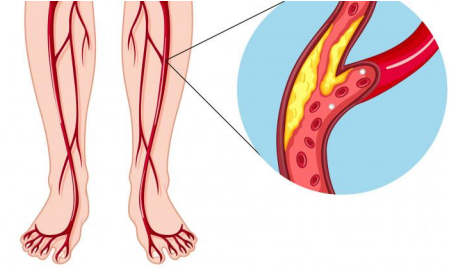
Finding ([JAMA Cardiology Sept 16, 2020](#)): women with **hypertensive disorders of pregnancy** and **low birth weight** had greater risk for **atherosclerotic cardiovascular disease** in menopause even after accounting for standard risk factors and other adverse pregnancy outcomes



National Heart, Lung,  
and Blood Institute

# Adverse Pregnancy Outcomes and Higher Risks for Future CVD

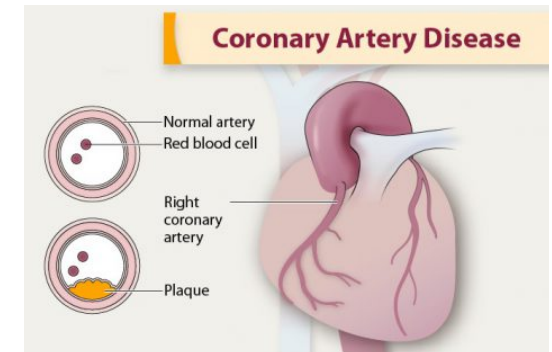
- Preeclampsia and acute adverse peripheral arterial events (*ATVB. 2021;41:526–533*)



- Preeclampsia and heart failure (*Hypertension. 2020;76:00-00*)



- Pre-term delivery and ischemic heart disease (*JACC 2020;76:57–67*)



# Importance of Asking About Pregnancy History

**2019 ACC/AHA Guideline** on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

## ■ *Top 10 Take-Home Messages for Primary Prevention of CVD*

- # 3. “Adults who are 40 to 75 years of age and are being evaluated for cardiovascular disease prevention should undergo **10-year** atherosclerotic cardiovascular disease (ASCVD) **risk estimation and** have a clinician–patient risk discussion **before starting** on pharmacological therapy, such as **antihypertensive therapy, a statin, or aspirin**. In addition, assessing for other **risk-enhancing factors** can help guide decisions about preventive interventions in select individuals, as can coronary artery calcium scanning.”

**Risk-Enhancing Factors** include: Family history of premature ASCVD...., History of premature menopause (before age 40 y) and history of **pregnancy-associated conditions** that increase later ASCVD risk, such as *preeclampsia*

# Objectives

1. Importance of promoting cardiovascular health in women
2. Special considerations in pregnancy and beyond
- 3. Post-menopausal cardiovascular health**



<https://www.facebook.com/NHLBI/posts/nhlbis-womens-health-initiative-who-is-one-of-the-largest-womens-health-projects/10158553313458833/>

# Menopause and Heart Disease

- Menopause does *\*not\** cause CV disease
- However, in middle age women do tend to develop more risk factors for heart disease
  - In part due to increasing body weight
  - In part because their bodies' production of estrogen drops
- An age-related increase in heart attacks among women is seen about 10 years after the average age of menopause



**Heart Attack Wallet Card**  
Know the warning signs



National Heart, Lung,  
and Blood Institute



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
National Institutes of Health  
National Heart, Lung, and Blood Institute  
NIH Publication No. 20-HL-8139 | November 2020



January 30, 2020

CLINICAL PRACTICE

Caren G. Solomon, M.D., M.P.H., Editor

## Hormone Therapy for Postmenopausal Women

JoAnn V. Pinkerton, M.D.

*This Journal feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the author's clinical recommendations.*

A healthy 53-year-old nonobese, menopausal woman presents with an 8-month history of menopausal symptoms, noting worsening hot flashes, soaking night sweats, and sleep disruption with fatigue that is affecting her work. Her mother had breast cancer at 75 years of age. Results of a recent mammogram were negative. The patient has heard that hormone therapy may be harmful but worries about functioning at work. How would you advise this patient?

### Author Conclusion and Recommendations

- Discussion should address
  - Benefits and risks of hormone and nonhormone therapies
  - Uncertainties regarding the effects of longer-term hormone use
- Appropriate recommendation
  - low-dose oral therapy with **estradiol or transdermal patch**, combined with micronized **progesterone or a synthetic progestin**.
  - If she prefers not to use or has contraindications to hormone therapy, **SSRI** could be started

# Some Key Clinical Points (Pinkerton JV, NEJM 2020)

- **Primary or secondary prevention of coronary heart disease or dementia:**  
Hormone therapy \*not\* recommended
- **Early menopause:** If no contraindications, hormone therapy recommended until at least the average age of natural menopause
- **Hot flashes and night sweats:** hormone therapy can be recommended for symptom relief in women <60 age or within 10 years after onset of menopause
- **Genitourinary symptoms only:** local vaginal hormone therapies recommended

# Summary

## 1. Importance of promoting cardiovascular health in women

- Rising rates of obesity; hypertension rates unchanged but still high
- Programs and toolkits to empower your patients to promote CV health
  - Resources: NHLBI, American Heart Association, CDC
- New USPSTF guidelines
  - Behavioral counseling interventions to promote healthy diet and physical activity in those with cardiovascular risk factors
  - Intervention for smoking cessation in adults, including pregnant women



# Summary

## 2. Special considerations in pregnancy and beyond

- Rising rates of US maternal mortality; disproportionately affecting Black and American Indian/Alaska Native women
- Opportunities for weight and BP management prepregnancy
- USPSTF Guidelines:
  - screening for gestational diabetes and preeclampsia;
  - low-dose aspirin for preeclampsia prevention
- AHA Scientific Statement for management of CVD during pregnancy
- Adverse pregnancy outcomes and future CVD risks



# Summary

## 3. Post-menopausal cardiovascular health

- In natural menopause, CVD prevention should \*not\* include estrogen
- Estrogen therapy considered for:
  - Early menopause
  - Symptomatic relief of hot flashes in <60 age or within 10 years of menopause
- Promotion of CV health – heart disease is still the #1 killer of women in U.S.



<https://www.facebook.com/NHLBI/posts/nhlbis-womens-health-initiative-who-is-one-of-the-largest-womens-health-projects/10158553313458833/>





National Heart, Lung,  
and Blood Institute

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# Questions?

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To receive CE/CME credit, you must register by 0745 ET on 26 February 2021 to qualify for the receipt of CE/CME credit or certificate of attendance. You must complete the program posttest and evaluation before collecting your certificate. The posttest and evaluation will be available through 11 March 2021 at 2359 ET. Please complete the following steps to obtain CE/CME credit:

1. Go to URL <https://www.dhaj7-cepo.com/content/feb-2021-ccss-emerging-priorities-womens-health>
2. Click on the REGISTER/TAKE COURSE tab
  - a. If you have previously used the CEPO CMS, click login.
  - b. If you have not previously used the CEPO CMS, click register to create a new account.
3. Click "ENROLL."
4. Follow the onscreen prompts to complete the following for each session you wish to claim CE/CME Credit:
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  - c. Complete the Evaluation
  - d. Take the Posttest
  - e. Download your Certificate(s)
  - f. Complete the Commitment to Change survey (optional)
5. After completing the posttest at 80% or above, your certificate will be available for print or download.
6. You can return to the site at any time in the future to print your certificate and transcripts at <https://www.dhaj7-cepo.com/>
7. If you require further support, please contact us at [dha.ncr.i7.mbx.cepo-cms-support@mail.mil](mailto:dha.ncr.i7.mbx.cepo-cms-support@mail.mil)