



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

What we do and do not know about the leading killer of women and what we should do about it!

In the session **Chronic Debilitating Disease**

October 20, 2021

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

C. Noel Bairey Merz, MD, FACC, FAHA, FESC
Irwin and Sheila Allen Trust Chair in Women's Health Research
Director, Barbra Streisand Women's Heart Center
Director, Linda Joy Pollin Women's Heart Health Program
Director, Preventive Cardiac Center
Director, Erika J. Glazer Women's Heart Research Initiative
Smidt Heart Institute
Professor of Medicine, Cedars-Sinai Medical Center



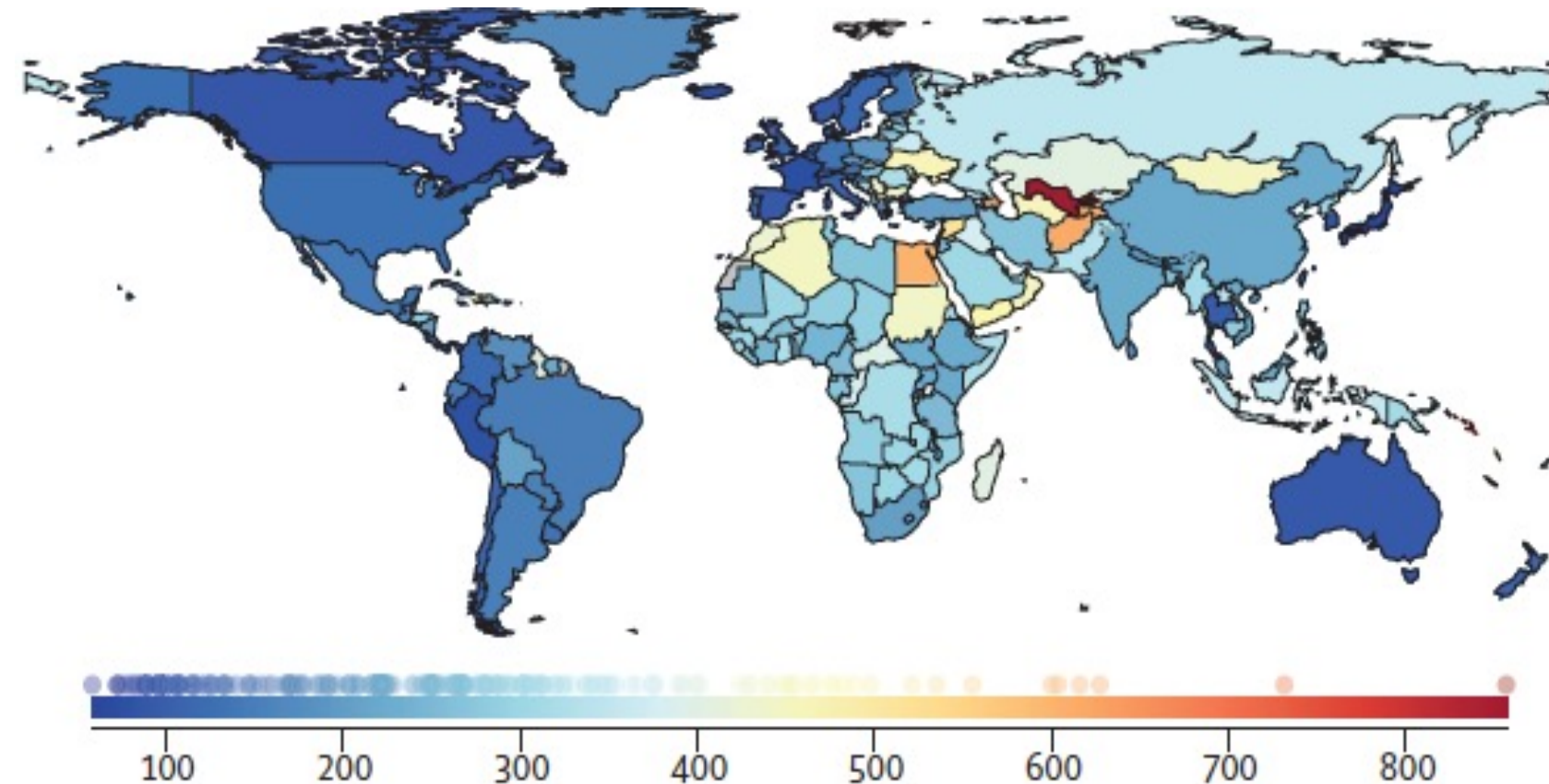
Advancing NIH Research on the Health of Women: A 2021 Conference

What we do and do not know about the leading killer of women and what we should do about it!

- 1. The leading killer of women**
- 2. What we do know**
- 3. What we do not know**
- 4. What we should do about it!**

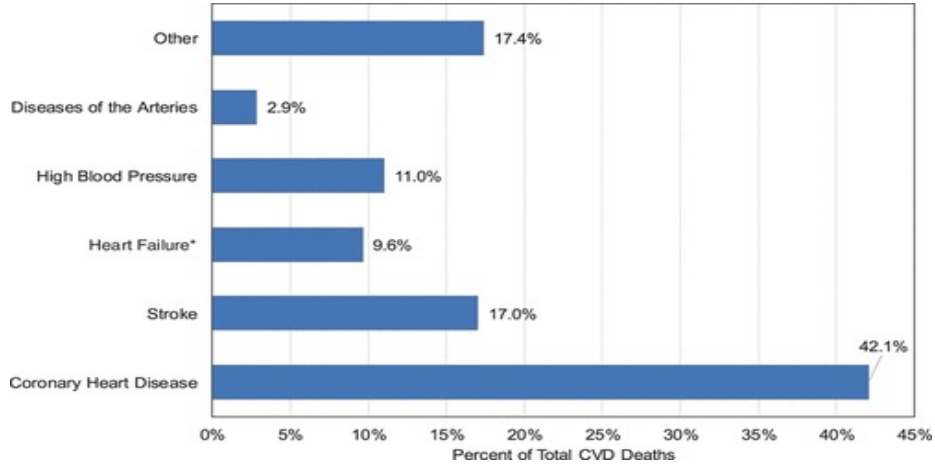
The Global Burden of CVD Mortality in Women – CVD is the leading killer of women

Age-standardized CVD mortality in women 2019 (deaths per 100,000)



- There were an estimated **6.06 million deaths** (95% UI 5.62 to 6.41 million deaths) from cardiovascular disease in women in **1990**, rising to **8.94 million** (95% UI 7.92 to 9.71 million) in **2019**

Trends in Cardiovascular Disease (CVD) Mortality Among Women & Men USA – 1979-2018



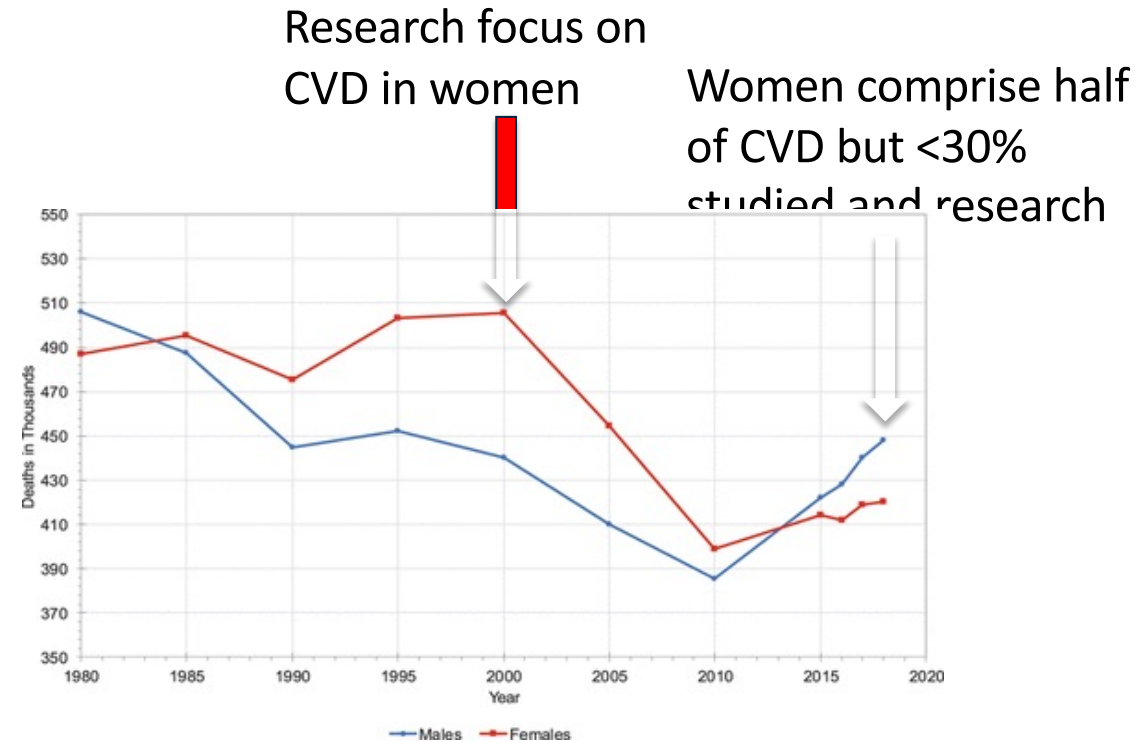
CVD Mortality Trends for Women & Men

Sex Differences in Presentation, Diagnostic Evaluation, & Management of Women with Ischemic Heart Disease

30% CVD Mortality Decline for Women

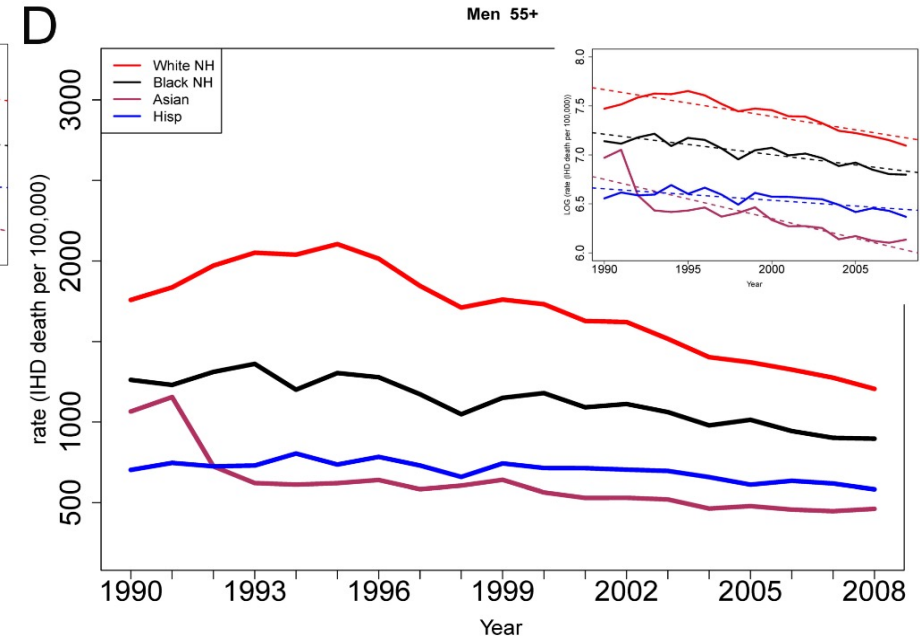
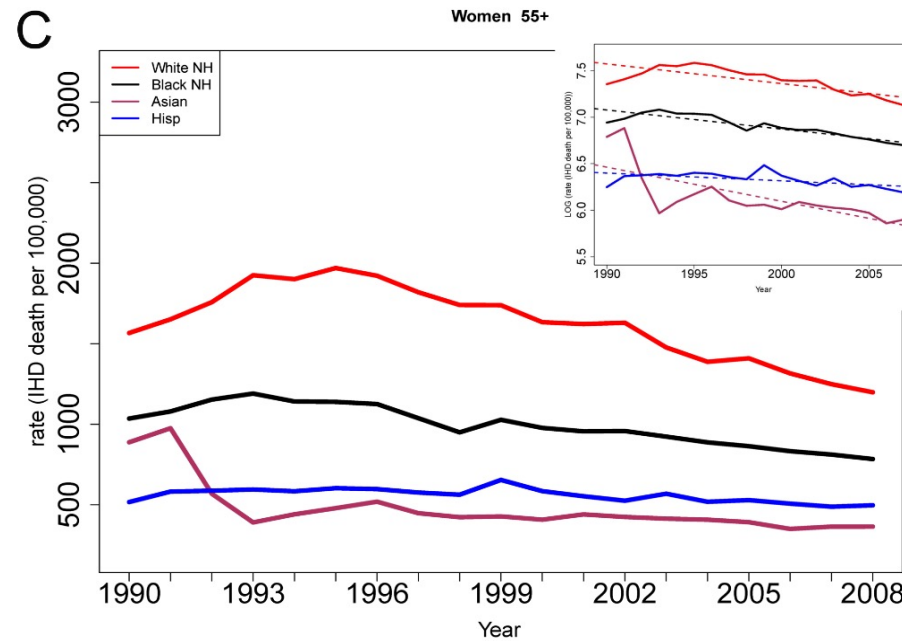
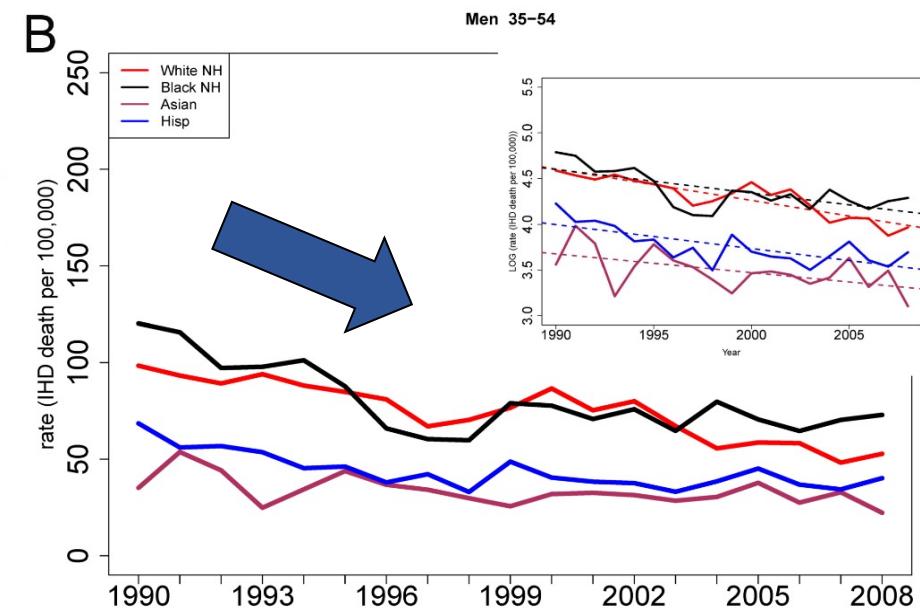
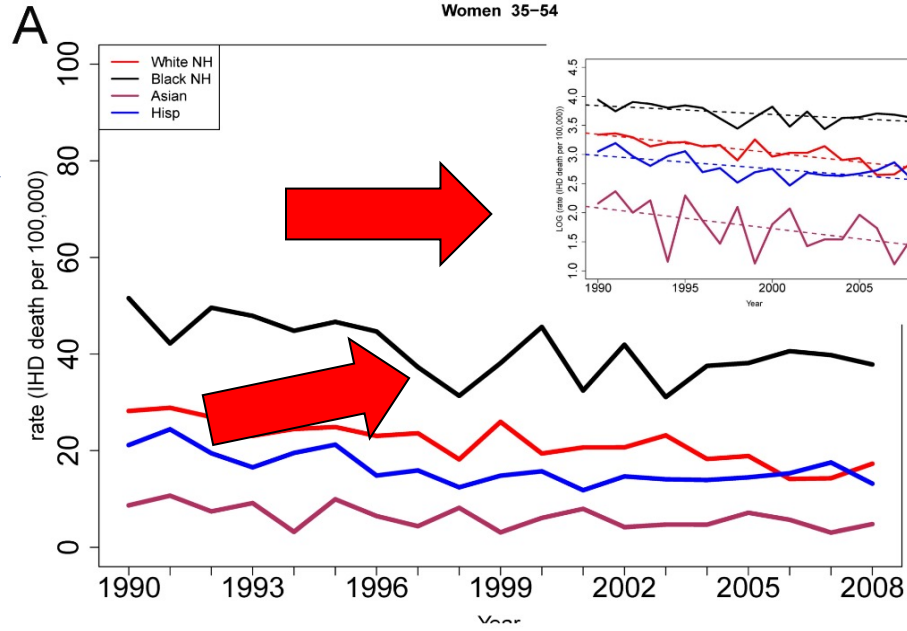
Increased Awareness, Focused Clinical Research, & Application of Guideline-Directed Care

However, Declines for Women Are Less Particularly for Younger Women of Diverse Race & Ethnicity



Trends in CVD Mortality in Younger Women & Men USA 1990-2008

CVD mortality is stagnant for younger women and rising in young women of color while younger male mortality including men of color is decreasing



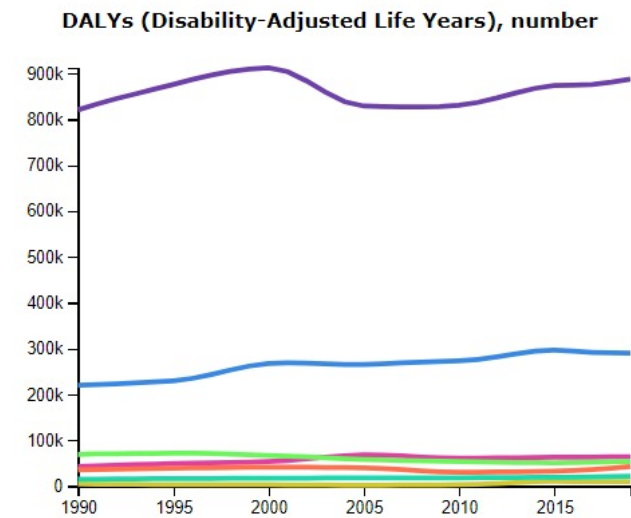
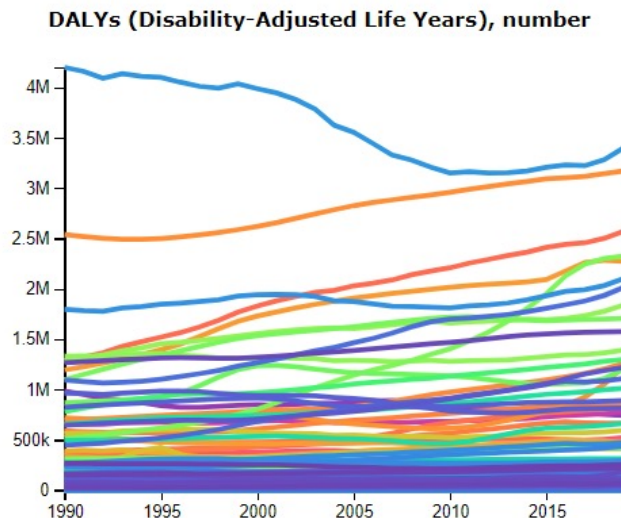
USA causes of Morbidity (female)



Ischemic heart disease is the leading cause of morbidity in women

All Causes	Number
Ischemic heart disease	3,396,660.99
Low back pain	3,168,583.64
Chronic obstructive pulmonary disease	2,568,947.62
Drug use disorders	2,323,237.88
Other musculoskeletal disorders	2,272,845.13
Stroke	2,098,900.22
Diabetes mellitus	2,010,853.68
Tracheal, bronchus, and lung cancer	1,838,401.23
Depressive disorders	1,704,524.23
Headache disorders	1,573,325.64

Female-Specific	Number
Gynecological diseases	887,253.85
Premenstrual syndrome	289,608.07
Uterine fibroids	64,009.99
Endometriosis	53,777.58
Polycystic ovarian syndrom	42,738.54
Genital prolapse	21,613.33
Female infertility	9,774.21





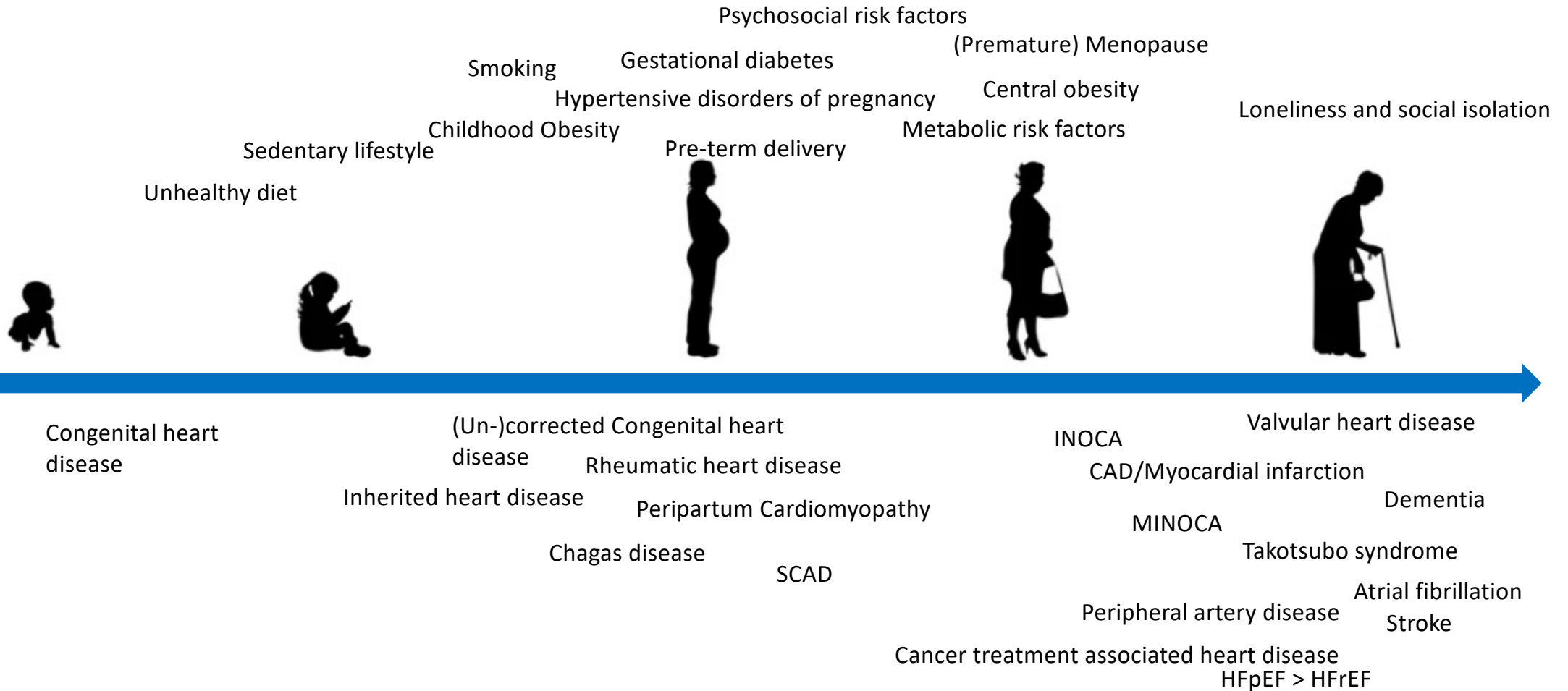
Advancing NIH Research on the Health of Women: A 2021 Conference

What we do and do not know about the leading killer of women and what we should do about it!

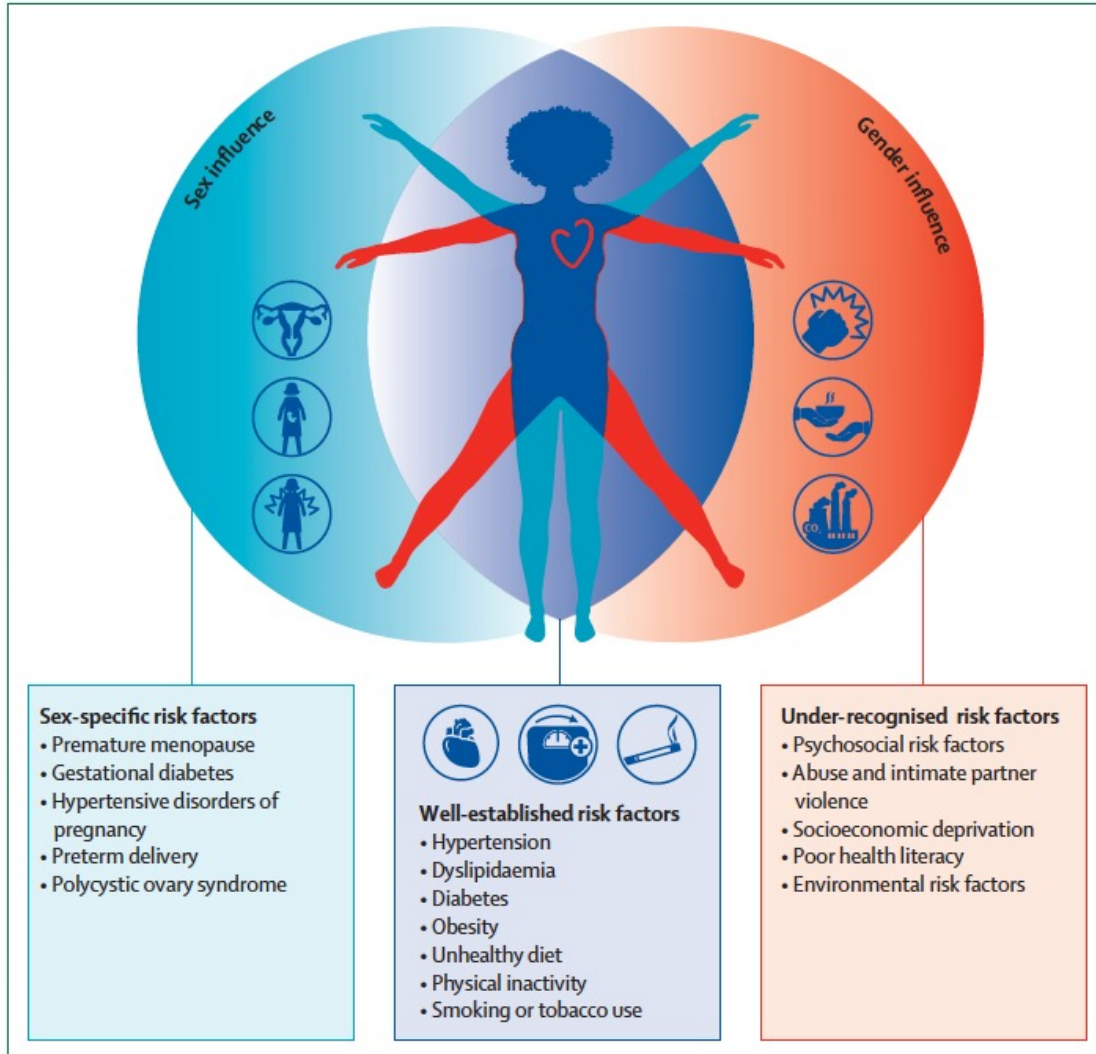
- 1. The leading killer of women**
- 2. What we do know**
- 3. What we do not know**
- 4. What we should do about it!**

Cardiovascular disease and their risk factors/modifiers over the lifecycle of a woman - opportunities to deliver comprehensive care and intervene

Socioeconomic risk factors



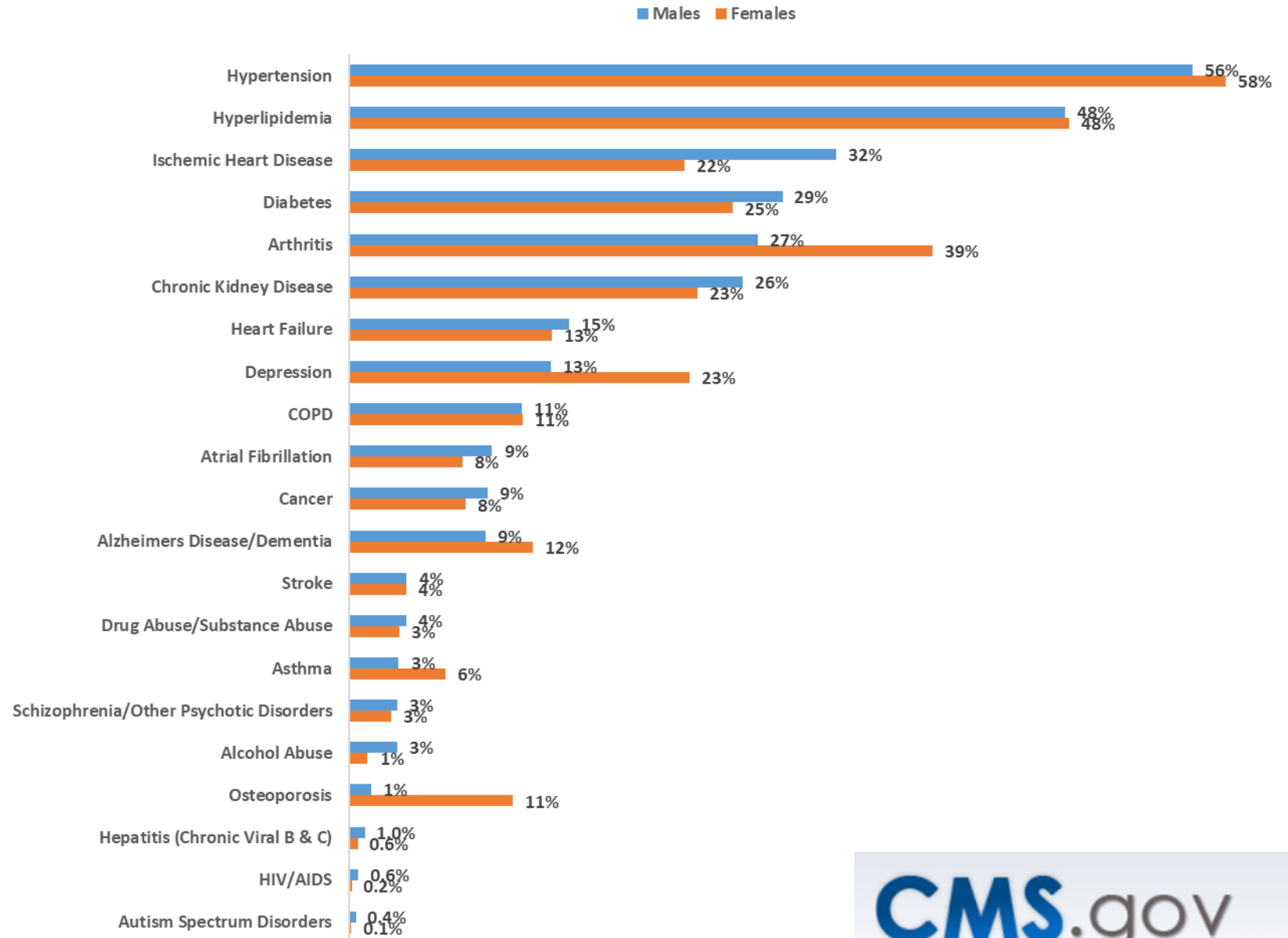
Risk factors for cardiovascular disease in women



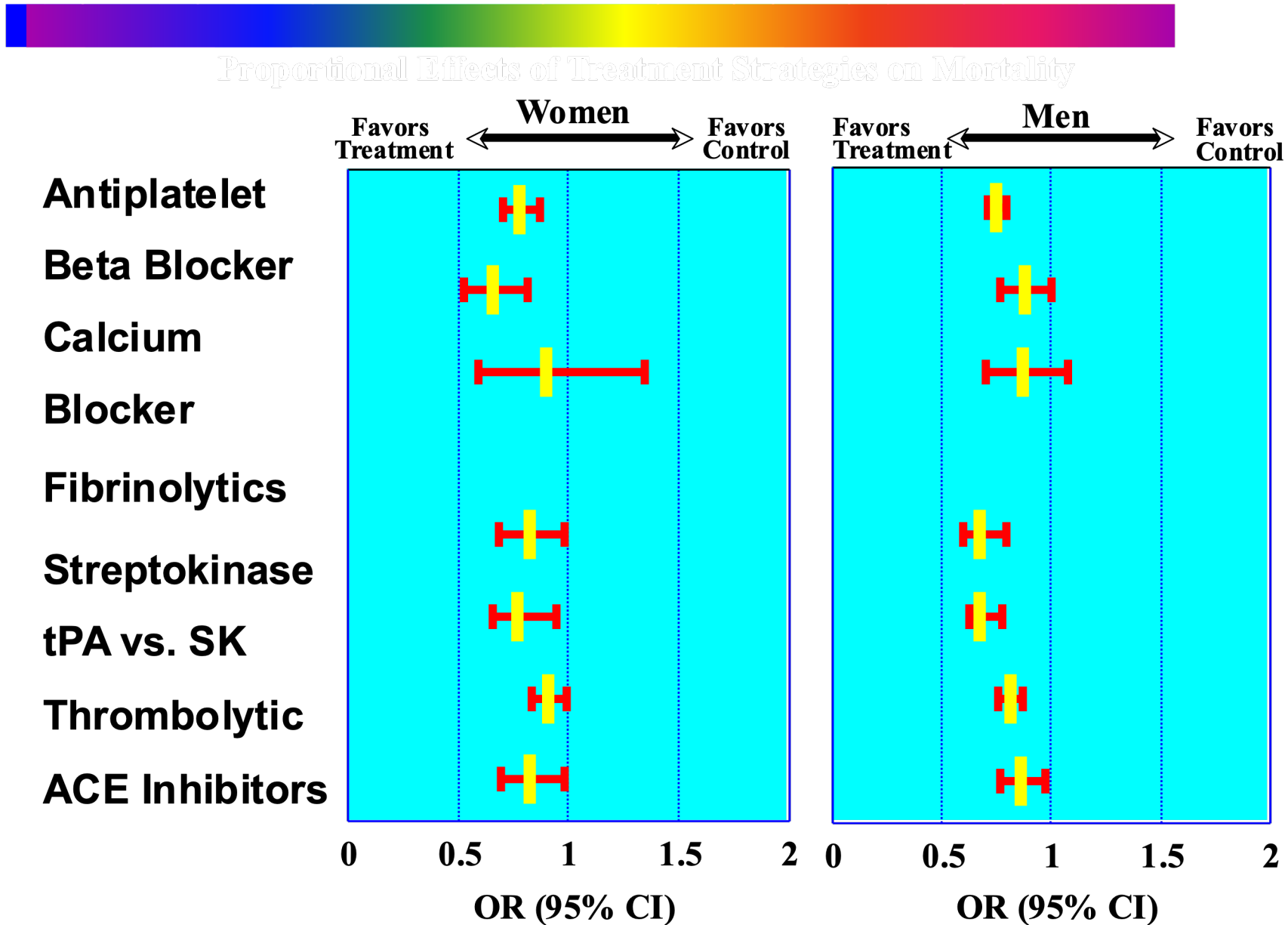
- Well-established: affect both sexes
- Mild differences between women and men
- Some risk factors are sex-specific - pregnancy
- Under-recognized
- Undertreated
- Can be exacerbated because of gender and interaction with a woman's social and physical environment

Women have more chronic conditions compared to men, including treatable CVD risk factors

Figure 3: Prevalence of Chronic Conditions among Fee-for-Service Beneficiaries by Sex: 2018



CVD Treatment: women and men have similar risk benefit





American women speak up about heart HEALTH

A Research Report Prepared by GfK for GMMB and The Women's Heart Alliance

November 2014

Contact:

Mark Keida, mark.keida@gfk.com
Emily Sprague, emily.sprague@gfk.com

Funded by the Women's Heart Alliance, a project of the Barbra Streisand Women's Heart Center and the Ronald Perelman Heart Foundation

CENTRAL ILLUSTRATION Knowledge, Attitudes and Beliefs Regarding Cardiovascular Disease in Women:
The Women's Heart Alliance

1
Cardiovascular disease (CVD) is the top cause of death in women in the U.S.
CVD kills more women than all cancers combined

400,000
women died from CVD
in 2016 (U.S.A.)

And yet ...



Only 45%
of women
know CVD
is #1 killer

A need to
raise awareness
of risk and
symptoms of
heart disease



26% of women find
CVD embarrassing,
assuming risk
is solely linked
to weight

A need to
de-stigmatize
the disease risk
by countering
stereotypes
with facts



Only 40%
of routine care
includes a
heart risk check

A need to
invest in women's CVD research
and physician education/training



Only 39%
of primary care
physicians (PCPs)
make CVD a
top priority



Only 22%
of PCPs and 42%
of cardiologists
feel well prepared
to assess CVD risk

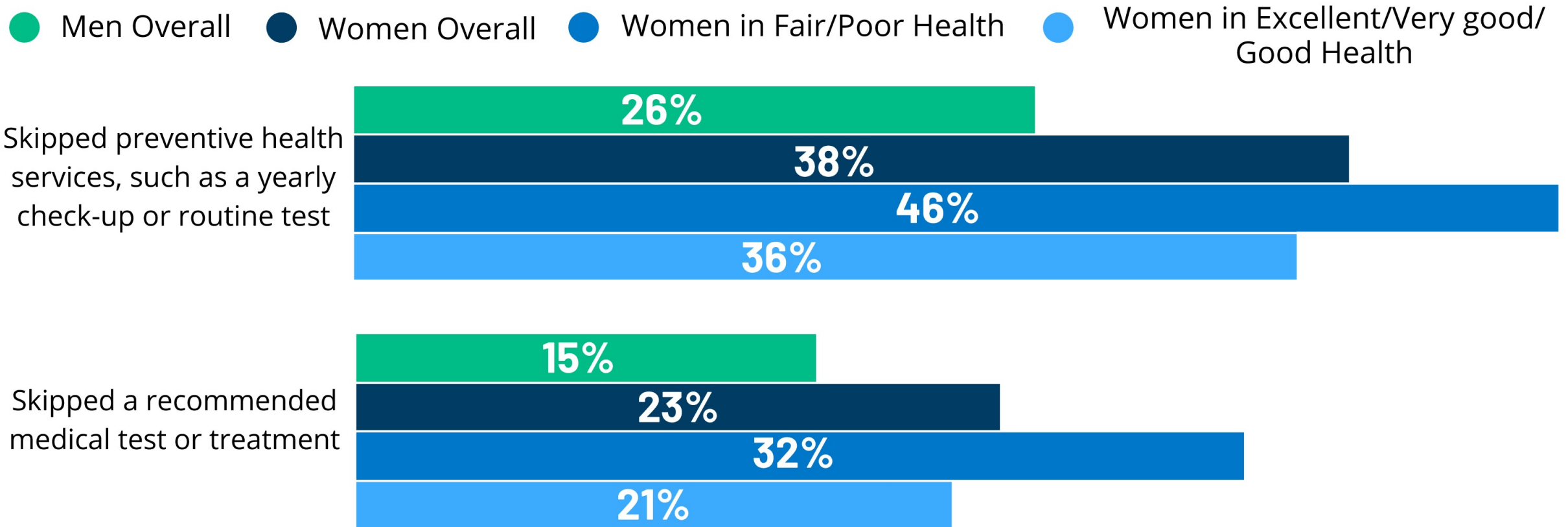
Bailey Merz, C.N. et al. J Am Coll Cardiol. 2017;■(■):■-■.

Knowledge, attitude and belief barriers for community woman and physicians from surveys conducted by the Women's Heart Alliance resulting in opportunities for community women and physician campaigns to improve women's heart health. CVD = cardiovascular disease; PCP = primary care physician.

- Low public awareness
- Fat shaming
- Low system awareness
- Low physician awareness
- Low physician education

A Larger Share of Women Have Gone Without Health Care Services During the Pandemic, Particularly Women in Fair or Poor Health

Since March 1, 2020, have you experienced any of the following because of the COVID-19 pandemic, or not?





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

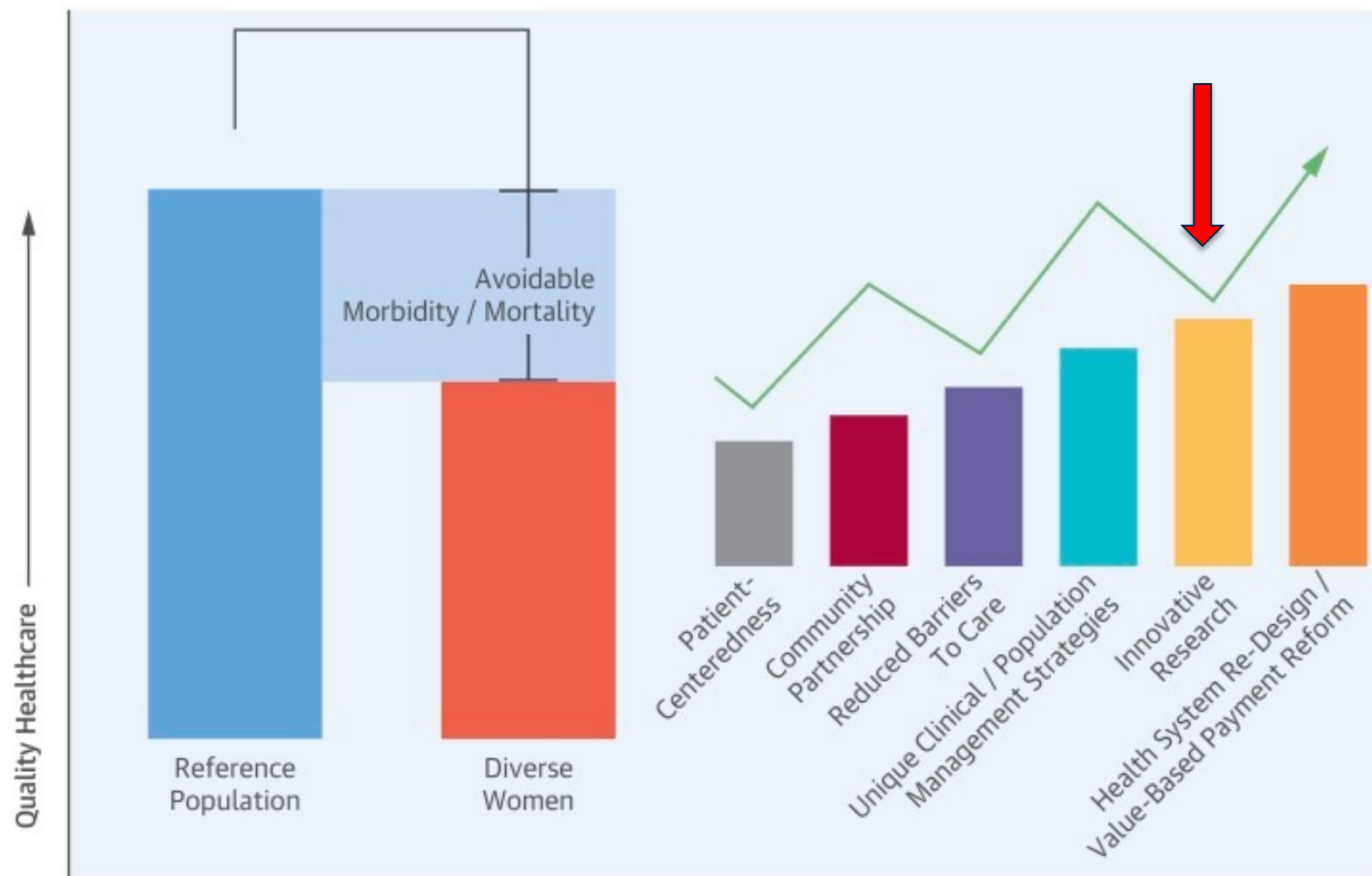
What we do and do not know about the leading killer of women and what we should do about it!

- 1. The leading killer of women**
- 2. What we do know**
- 3. What we do not know**
- 4. What we should do about it!**

What We Do Not Know:

- How to reduce avoidable morbidity/mortality and achieve equity in CVD and comorbidities in women? – **address knowledge gaps**

CENTRAL ILLUSTRATION: Achieving Equity in Quality of Care for Women

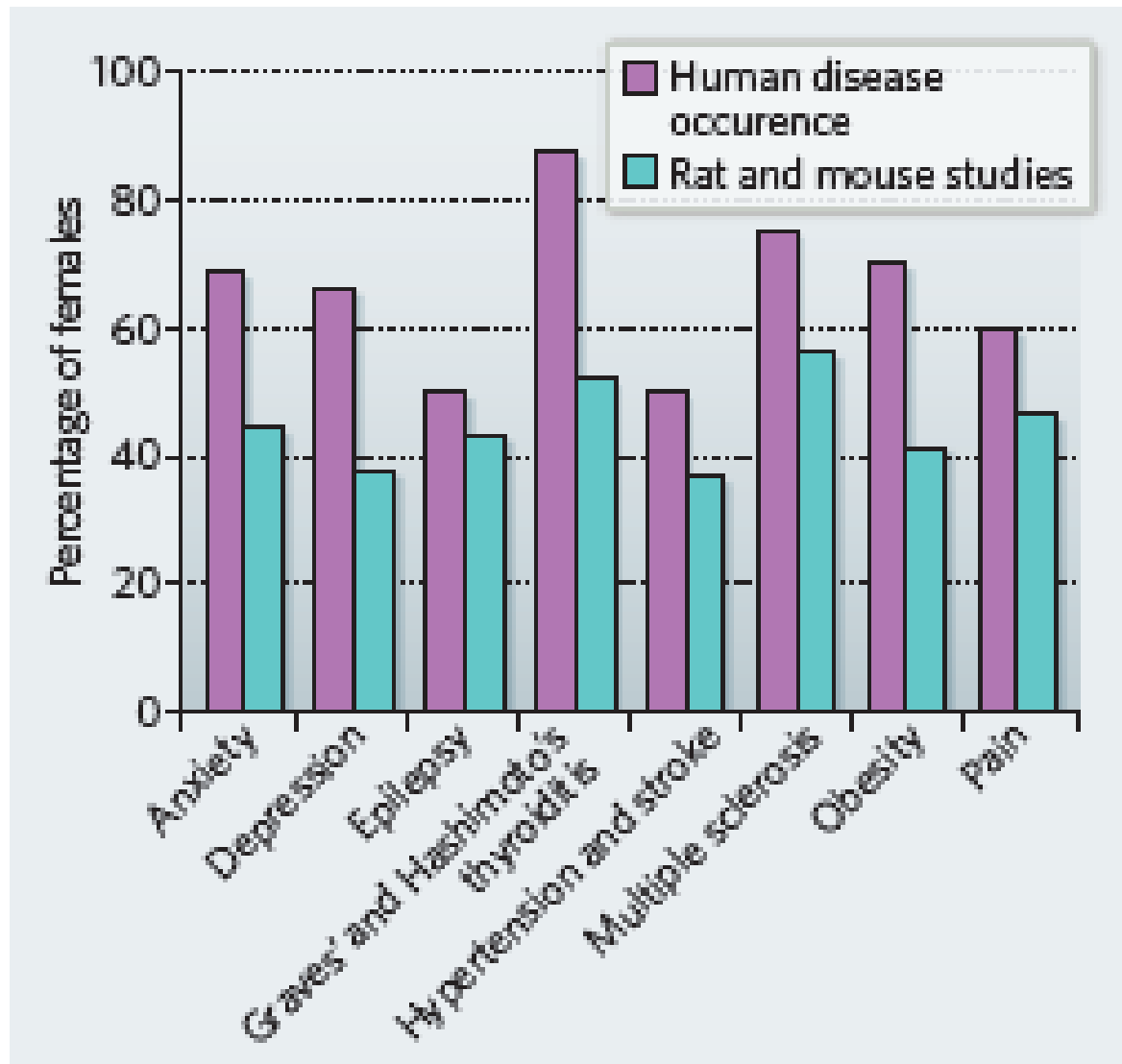


Shaw, L.J. et al. J Am Coll Cardiol. 2017;70(3):373-88.

WE HAVE STUDIES OF FRUIT FLIES, MICE,
HAMSTERS, FROGS, MONKEYS AND MEN
WITH THIS CONDITION - BUT MEDICAL
RESEARCH USING WOMEN AS SUBJECTS
JUST NEVER OCCURRED TO ANYBODY.

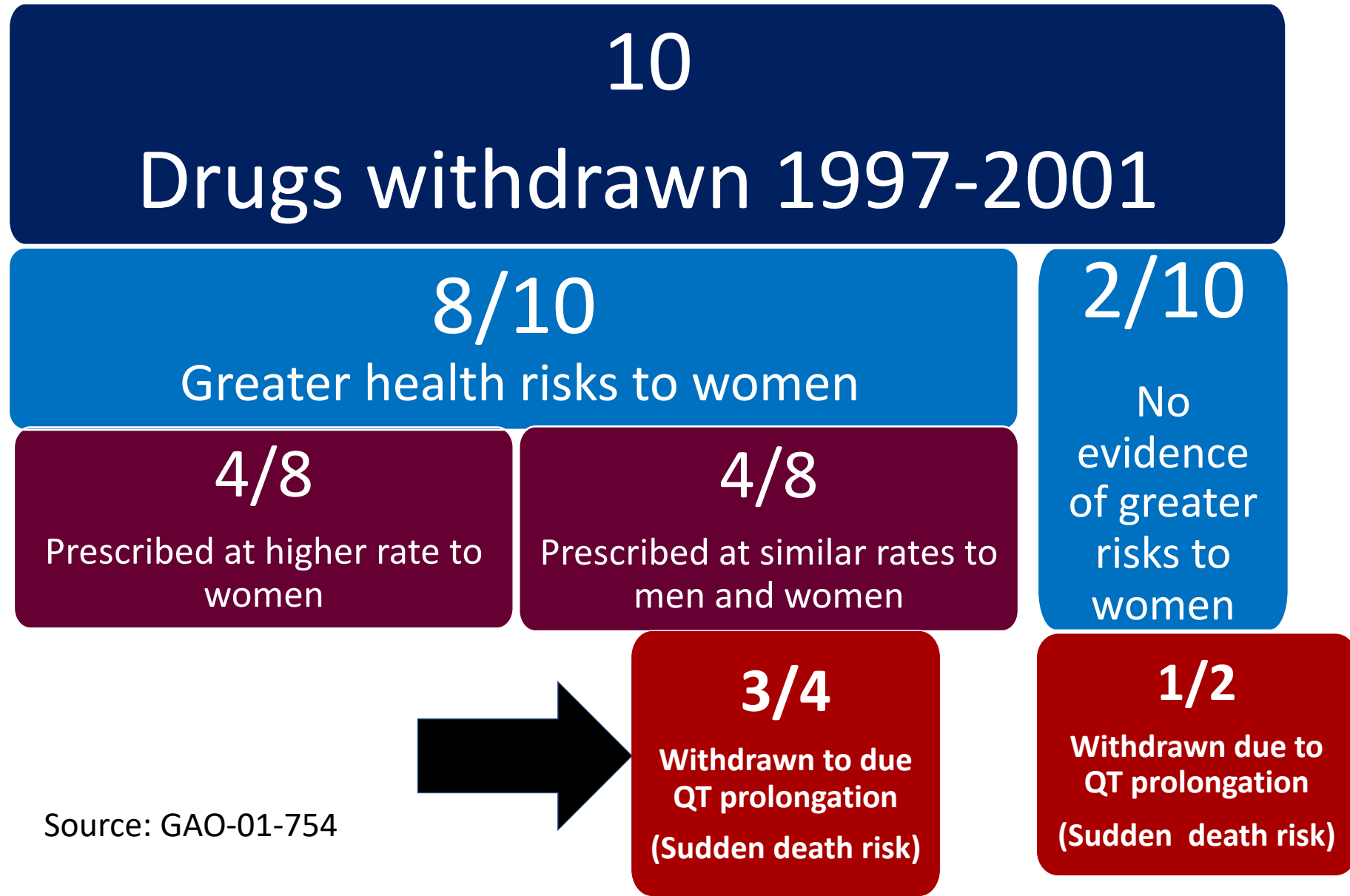


What we do not know: Male animals used to study female disease



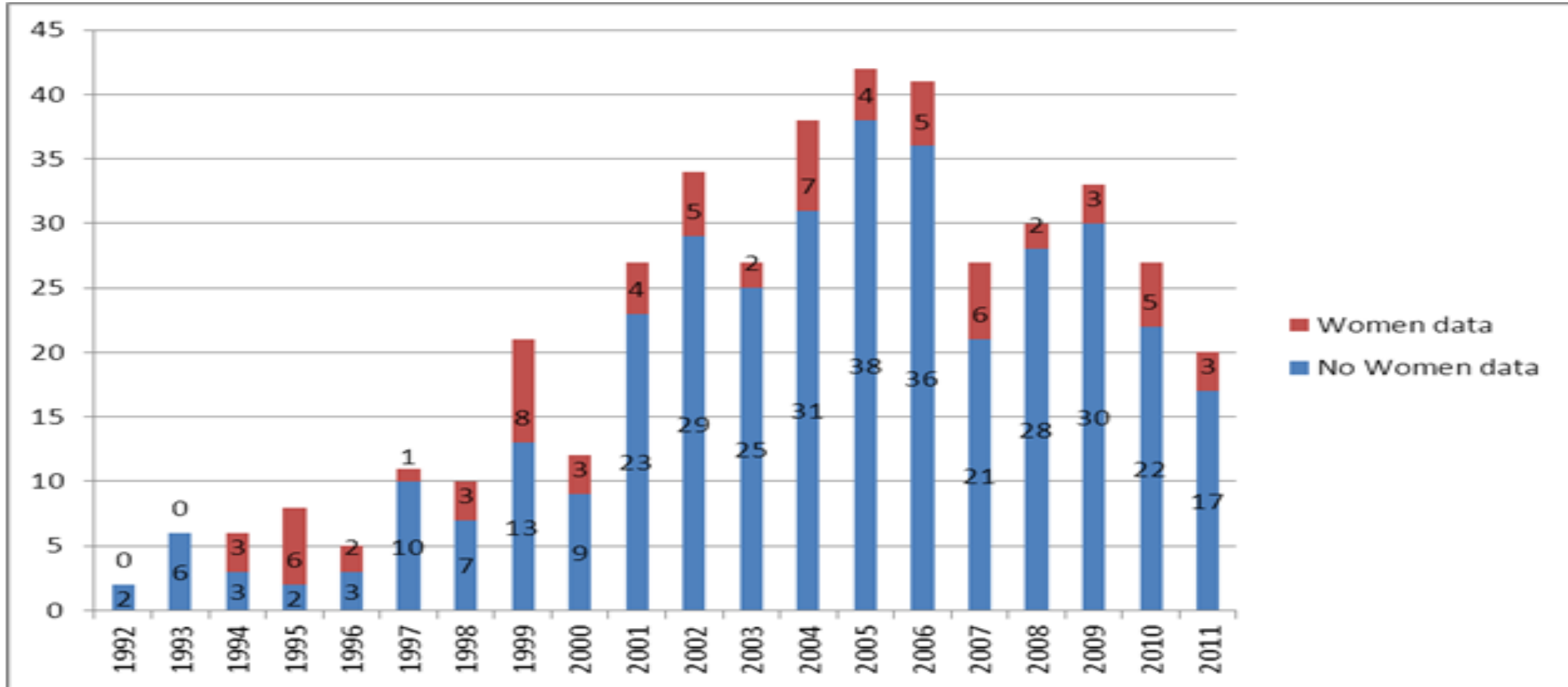
Gender gap. The percentage of women in the total population presenting with a disease (purple; see ref. 1) outstrips the percentage of females in rat and mouse models of that disease (green; data from Web of Science). Only studies with 'female' or 'male' as keywords were captured, so the chart underestimates male bias relative to a survey of individual articles by field.

Consequences: FDA Drug Withdrawals 2001 FDA GAO



Source: GAO-01-754

What we do not know: Minority number of articles report data on women by year



17 percent of the articles comparing treatment strategies for CAD reported sex-specific outcomes



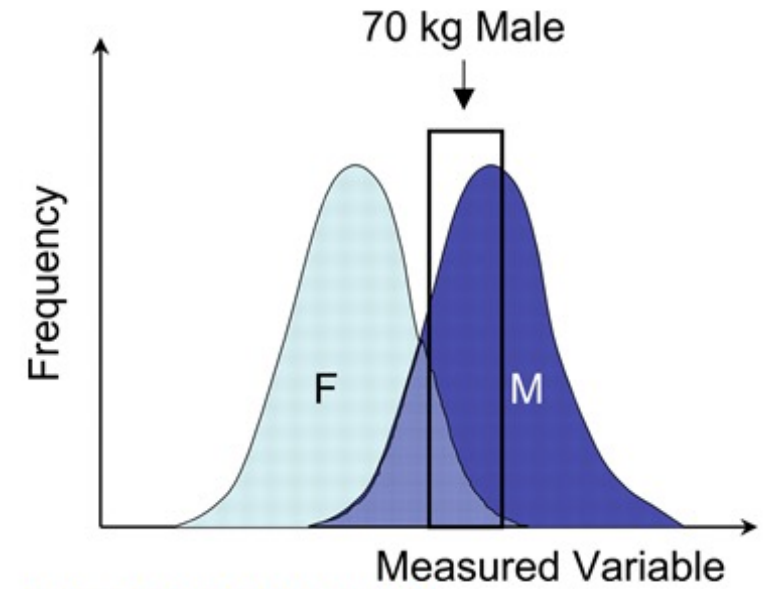
Consequences: Sex Differences in Cardiovascular Disease Biomarkers

Soetkamp D, et al Expert Review of Proteomics, 2017(14)11

Despite their current widespread use, cardiac troponin assays lack sex specific reference value reporting, even for widely used commercial assays that indicate 99th percentile cutoffs or ranges 1.2-2.4 fold higher in males than females²². The same is true for CPK-MB¹⁶

Overall, these data suggest that at-risk women can be missed using the standard male sex-specific threshold, and that those women that meet standard AMI troponin criteria have suffered a greater degree of myocardial damage²⁶

Sampling a subset of a population may represent only a portion of the population.



Virginia H. Huxley Advan In Physiol Edu 2007;31:17-22

Advances in Physiology Education

©2007 by American Physiological Society

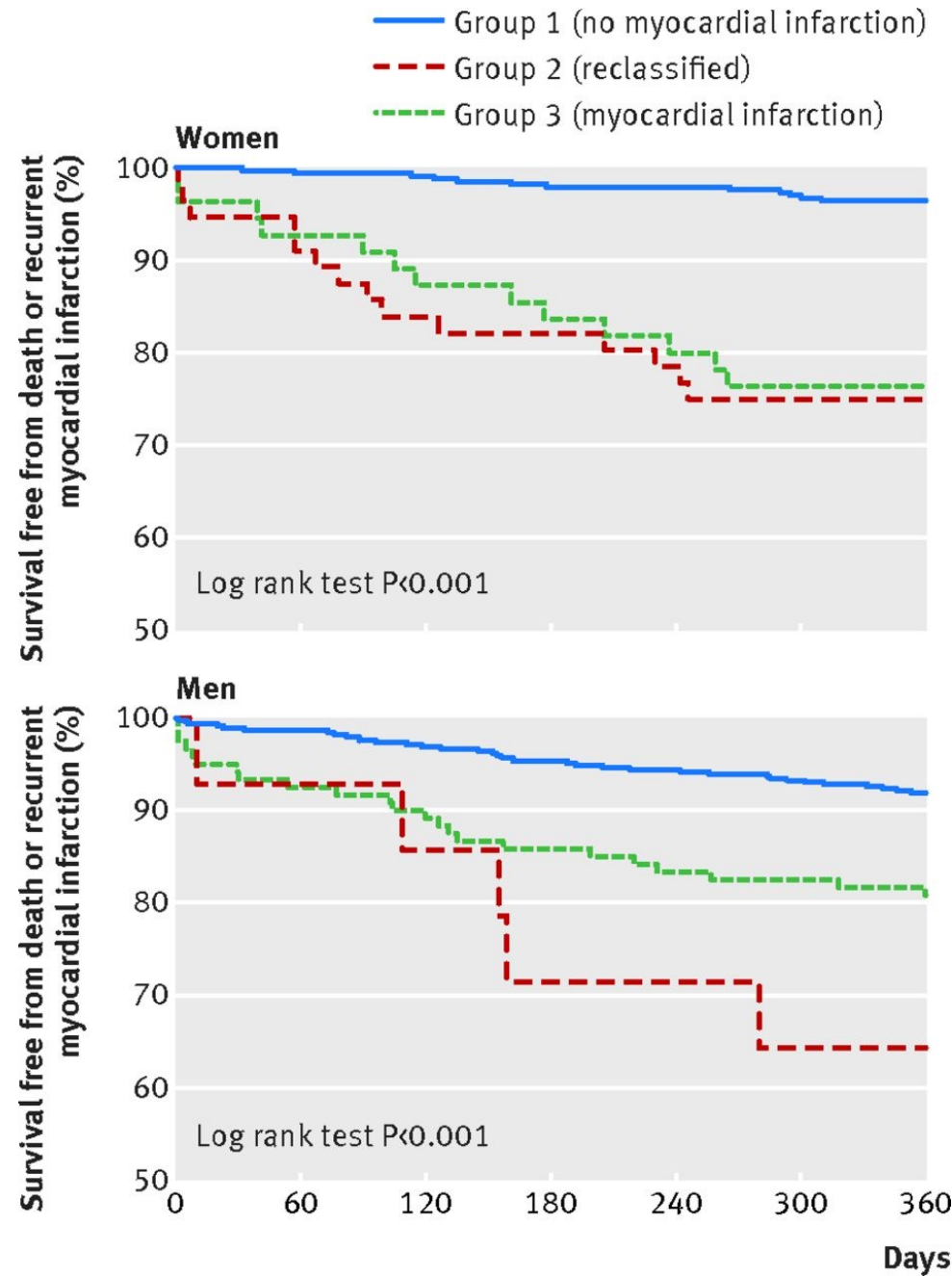
²Apple FS, Ler R, Murakami MM. Determination of 19 cardiac troponin I and T assay 99th percentile values from a common presumably healthy population. Clin Chem. 2012;58(11):1574-1581.

¹⁶ Apple FS, Quist HE, Doyle PJ, Otto AP, Murakami MM. Plasma 99th percentile reference limits for cardiac troponin and creatine kinase MB mass for use with European Society of Cardiology/American College of Cardiology consensus recommendations. Clin Chem. 2003;49(8):1331-1336.

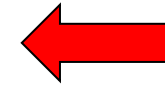
²⁶ Slagman A, Searle J, Vollert JO, et al. Sex differences of troponin test performance in chest pain patients. Int J Cardiol. 2015;187:246-251.

Undiagnosed MIs are untreated MIs - 25-35% 1 yr death/MI rate

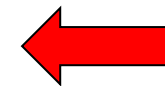
Fig 4 Survival free from death or recurrent myocardial infarction in women and men with suspected acute coronary syndrome.



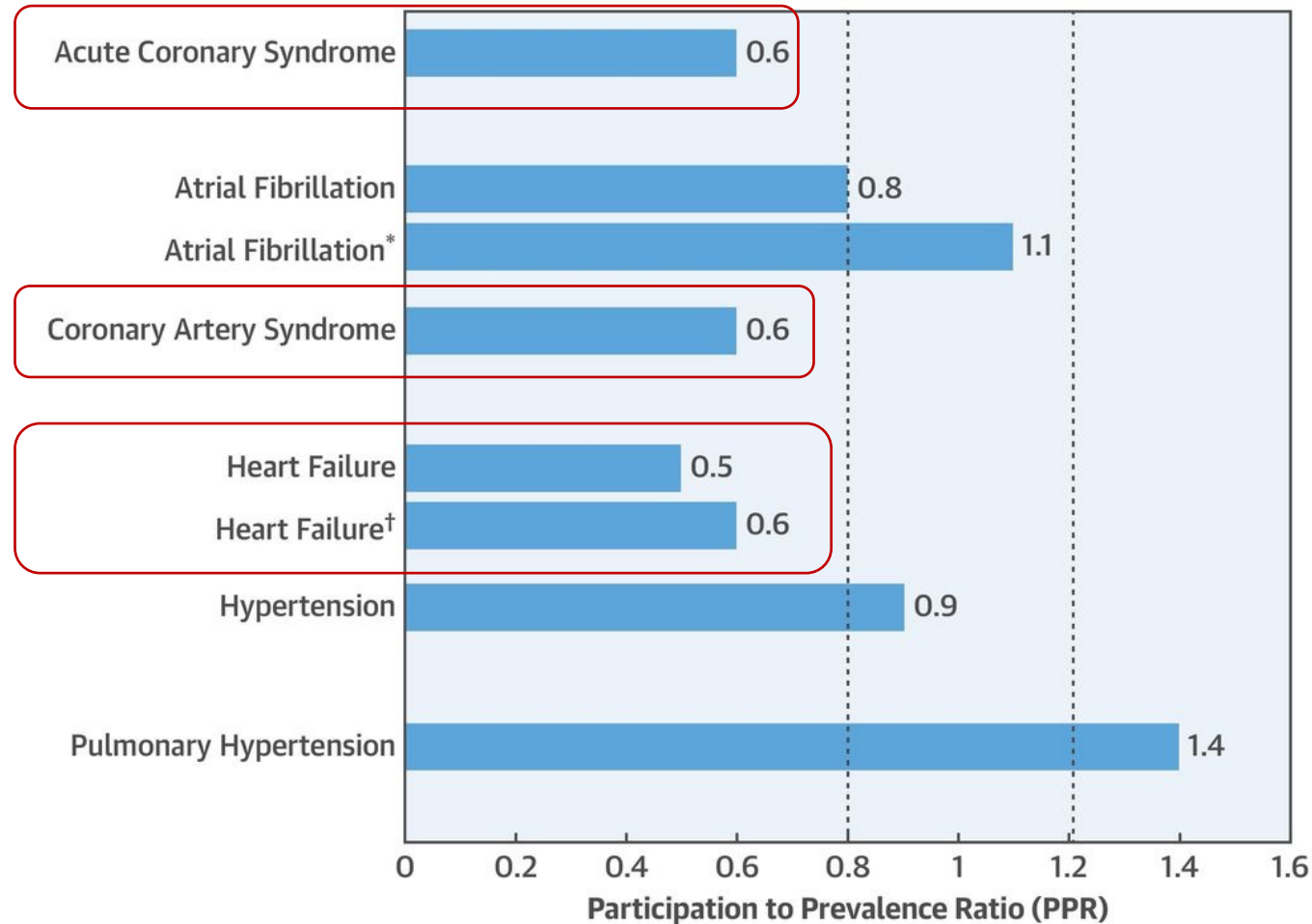
**Back to 1970s
AMI mortality!
for women**



and smaller men!



What we do not know: Women In Clinical Trials - Prevalence Corrected



Scott, P.E. et al. J Am Coll Cardiol. 2018;71(18):1960-9.

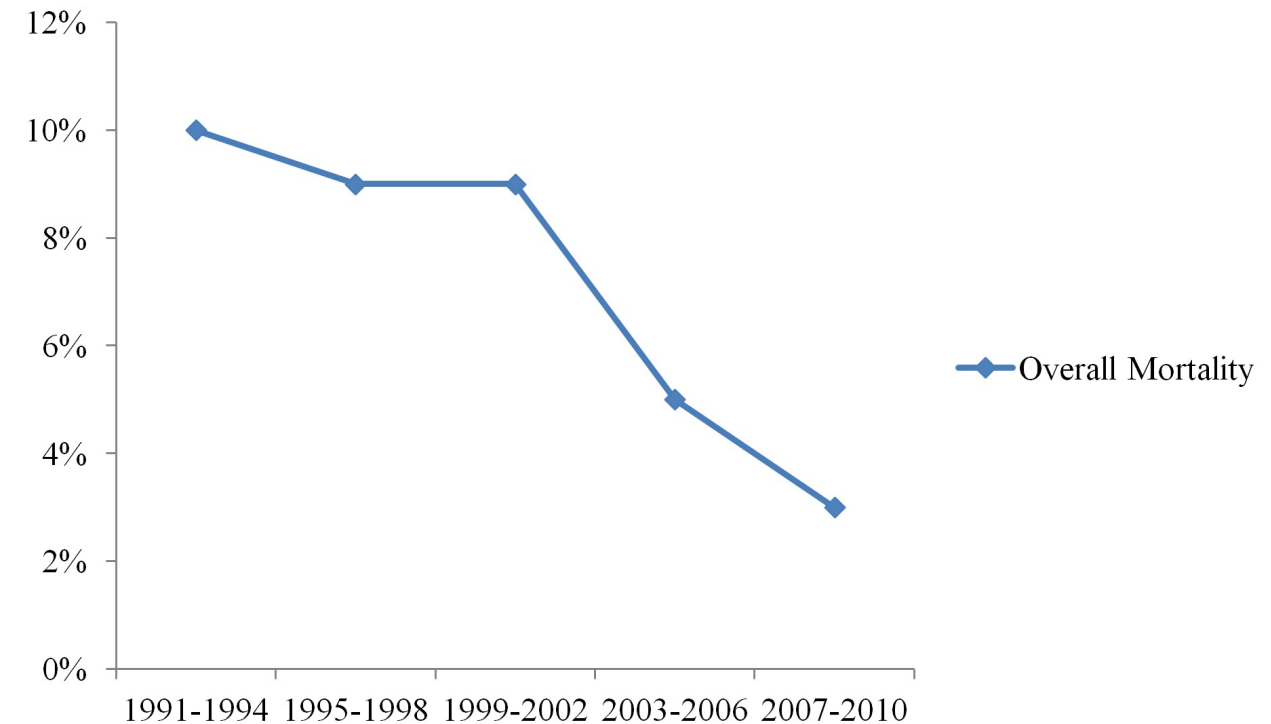
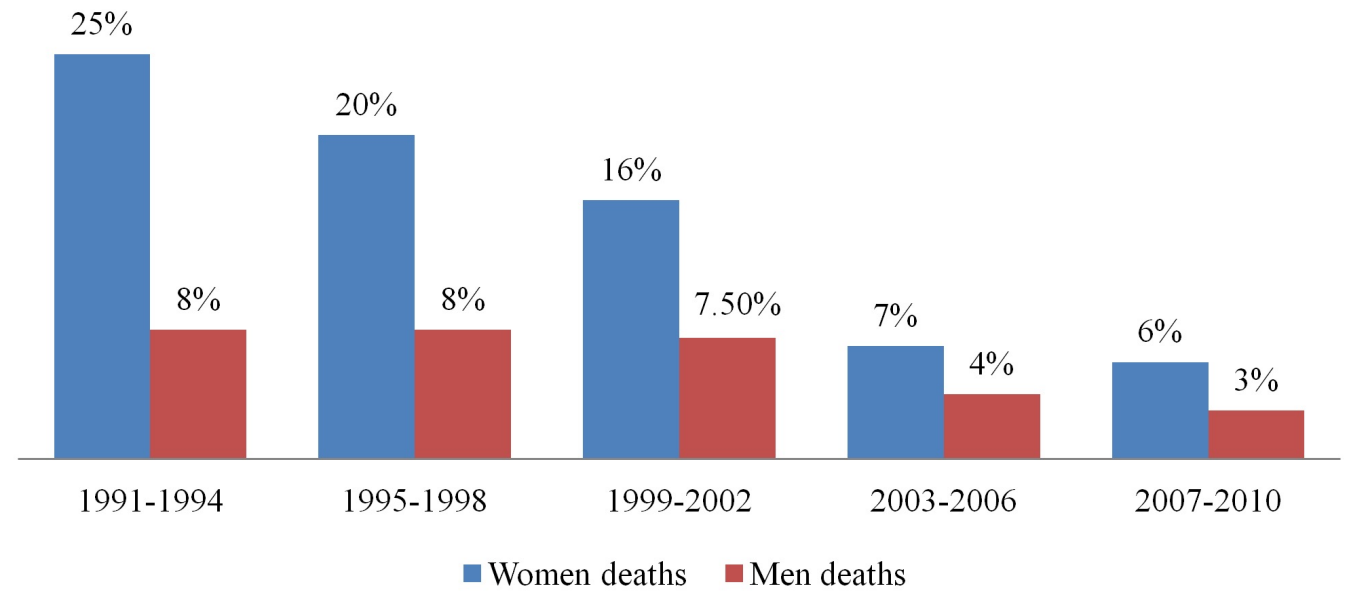
Mortality Trends in Women and Men Presenting with Acute Coronary Syndrome: Insights from a 20-Year Registry

Ayman El-Menyar, Emad Ahmed, Hajar Albinali, Hassan Al-Thani, Abdurrazak Gehani, Rajvir Singh, Jassim Al Suwaidi

Published: July 31, 2013 • <https://doi.org/10.1371/journal.pone.0070066>

Consequences: persistent higher ACS mortality in women

Women presenting with ACS are high-risk population and their in-hospital mortality remains higher for all age groups in comparison to men. Although, substantial improvement in the hospital outcome has been observed, guidelines adherence and improvement in the hospital care have not yet been optimized.





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

What we do and do not know about the leading killer of women and what we should do about it!

- 1. The leading killer of women**
- 2. What we do know**
- 3. What we do not know**
- 4. What we should do about it!**

Social Justice



WOMEN'S HEART

ALLIANCE



NewYork-Presbyterian
Weill Cornell Medical Center
Ronald O. Perleman
Heart Institute

 CEDARS-SINAL
BARBRA STREISAND
WOMEN'S HEART CENTER

OUR MISSION

- The Women's Heart Alliance will raise awareness, encourage action and drive support for women-focused research and treatment to fight women's heart disease.
- Our goals are to:
 - Empower women to take action to fight heart disease;
 - Engage doctors in improving diagnosis and treatment; and
 - Garner support for policy changes and women's heart disease funding.
- We need to demonize heart disease.

Using a celebrity lead national and local campaign:

- Awareness: destigmatize, counter stereotypes with facts, increase risk factor awareness and call to action
- Action : #get heart checked
(new ASCVD risk score that works better in women and ethnic groups)
- Advocacy: we spend 10X more NIH and NGO funds on breast cancer research, yet CVD kills 10X more women;
(AHA spends <4% of Go Red proceeds on women's CVD research)

PSA Campaign

- <https://vimeo.com/user13782109/review/592182222/e3646b0bba>