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

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#HealthOfWomen2021
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

http://ihmeuw.org/5g2s
Trends in Cardiovascular Disease (CVD) Mortality Among Women & Men USA – 1979-2018

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

AHA Statistics 2020, Circulation 2.21
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.

Adverse Trends in Ischemic Heart Disease Mortality among Young New Yorkers, Particularly Young Black Women Nathaniel R. Smilowitz Gil A. Maduro Jr. Iryna V. Lobach Yu Chen Harmony R. ReynoldsPublished: February 16, 2016 https://doi.org/10.1371/journal.pone.0149015
Ischemic heart disease is the leading cause of morbidity in women.
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Cardiovascular disease and their risk factors/modifiers over the lifecycle of a woman - opportunities to deliver comprehensive care and intervene

**Socioeconomic risk factors**

- Smoking
- Gestational diabetes
- (Premature) Menopause
- Central obesity
- Loneliness and social isolation

**Psychosocial risk factors**

- Childhood Obesity
- Pre-term delivery

**Metabolic risk factors**

- Unhealthy diet
- Sedentary lifestyle
- Congenital heart disease
- Unhealthy diet

**Congenital heart (Un-)corrected**

- Congenital heart disease
- Rheumatic heart disease
- Peripartum Cardiomyopathy

**Valvular heart disease**

- INOCA
- CAD/Myocardial infarction
- MINOCA
- Takotsubo syndrome
- Atrial fibrillation

**Inherited heart disease**

- (Un-)corrected Congenital heart disease
- Valvular heart disease
- MINOCA
- Peripheral artery disease
- Stroke

**SCAD**

- Chagas disease
- SCAD
- Cancer treatment associated heart disease
- HFpEF > HFrEF
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.
CVD Treatment: women and men have similar risk benefit

Proportional Effects of Treatment Strategies on Mortality

- **Women**
  - Antiplatelet
  - Beta Blocker
  - Calcium
  - Blocker
  - Fibrinolytics
  - Streptokinase
  - tPA vs. SK
  - Thrombolytic
  - ACE Inhibitors

- **Men**
  - Antiplatelet
  - Beta Blocker
  - Calcium
  - Blocker
  - Fibrinolytics
  - Streptokinase
  - tPA vs. SK
  - Thrombolytic
  - ACE Inhibitors

OR (95% CI)
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
• 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?

- Skipped preventive health services, such as a yearly check-up or routine test:
  - Men Overall: 26%
  - Women Overall: 38%
  - Women in Fair/Poor Health: 46%
  - Women in Excellent/Very good/Good Health: 36%

- Skipped a recommended medical test or treatment:
  - Men Overall: 15%
  - Women Overall: 23%
  - Women in Fair/Poor Health: 32%
  - Women in Excellent/Very good/Good Health: 21%

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What We Do Not Know:

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

https://doi.org/10.1016/j.jacc.2017.05.051
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

Drugs withdrawn 1997-2001

8/10
Greater health risks to women

4/8
Prescribed at higher rate to women

4/8
Prescribed at similar rates to men and women

2/10
No evidence of greater risks to women

3/4
Withdrawn due to QT prolongation (Sudden death risk)

1/2
Withdrawn due to QT prolongation (Sudden death risk)

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

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 females. The same is true for CPK-MB.

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 damage.


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!

© 2015 by British Medical Journal Publishing Group
What we do not know: Women In Clinical Trials - Prevalence Corrected

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.
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Social Justice

WOMEN’S HEART ALLIANCE
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](https://vimeo.com/user13782109/review/592182222/e3646b0bba)