

Women make the difference in Heart Disease



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Sept 2021

"Historically, the anatomy and physiology of bodies with vaginas have been neglected."

See Perspectives page 1124



Debra Malina, Ph.D., *Editor*

Medicine Is Not Gender-Neutral — She Is Male

Kiki M.J. Lombarts, Ph.D., and Abraham Verghese, M.D.

March 2022

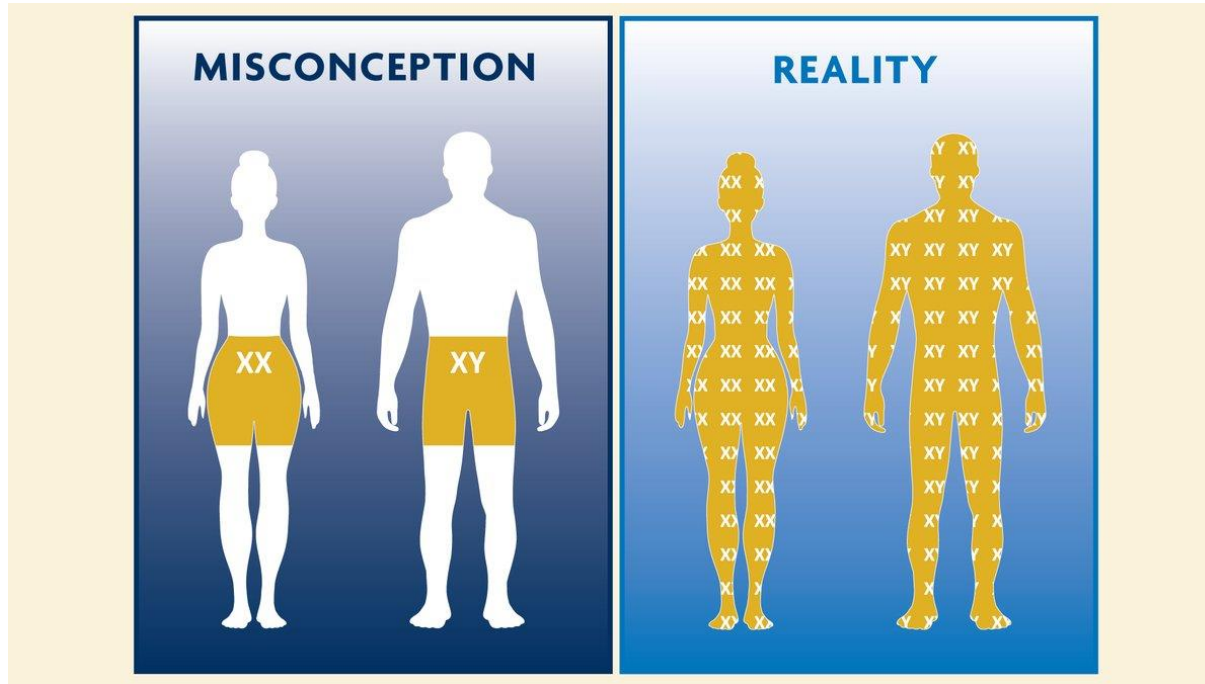
**Roles Go Back to Ancient Greece.
Women Are Still Paying the Price
Today**



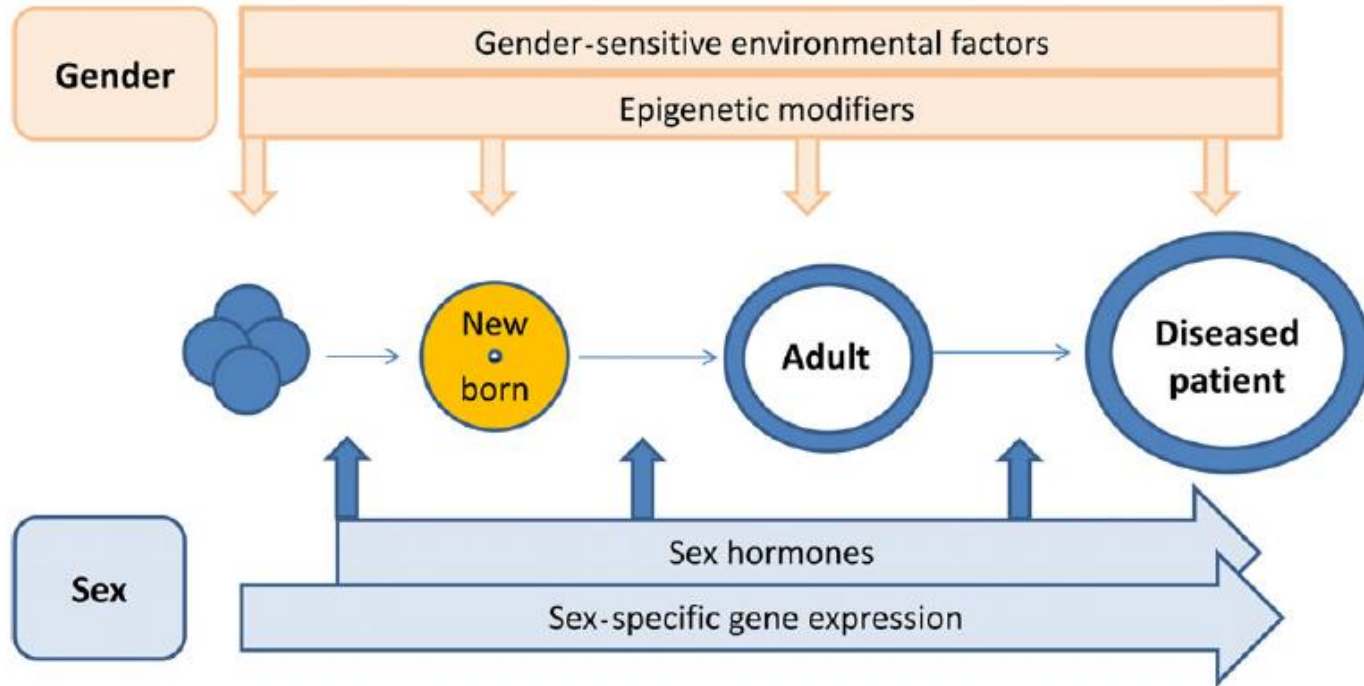
2022 NPO Doc Reference man



Every cell has a sex: X and Y and the future of health care



Interaction Sex & Gender during life-course:



Gendered Innovations | Stanford University

What is **Gendered Innovations**?

SEX & GENDER ANALYSIS

General Methods

Specific Methods

Terms

Checklists

CASE STUDIES

Science

Health & Medicine

Engineering

Environment

INTERSECTIONAL DESIGN

POLICY
RECOMMENDATIONS

VIDEOS



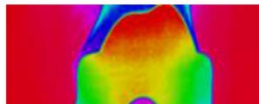
Chronic Pain: Analyzing How Sex and Gender Interact



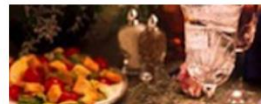
Colorectal Cancer: Analyzing How Sex and Gender Interact



Covid-19: Analyzing Sex and Analyzing Gender



De-Gendering the Knee: Overemphasizing Sex Differences as a Problem



Dietary Assessment Method: Analyzing How Sex and Gender Interact



Gender-Related Variables for Health Research



Heart Disease in Diverse Populations



Medical Technology: Intersectional Approaches



Nanomedicine: Analyzing Sex



**Prof Londa Schiebinger, History Science
Stanford University**



Nanotechnology-Based Screening for HPV: Rethinking Research Priorities



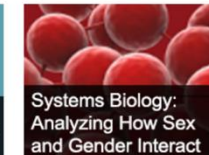
Nutrigenomics



Osteoporosis Research: in Men: Rethinking Standards and Reference Models



Prescription Drugs: Analyzing Sex & Gender



Systems Biology: Analyzing How Sex and Gender Interact

Make the difference when relevant:

2030

SUSTAINABLE DEVELOPMENT GOALS



Equality

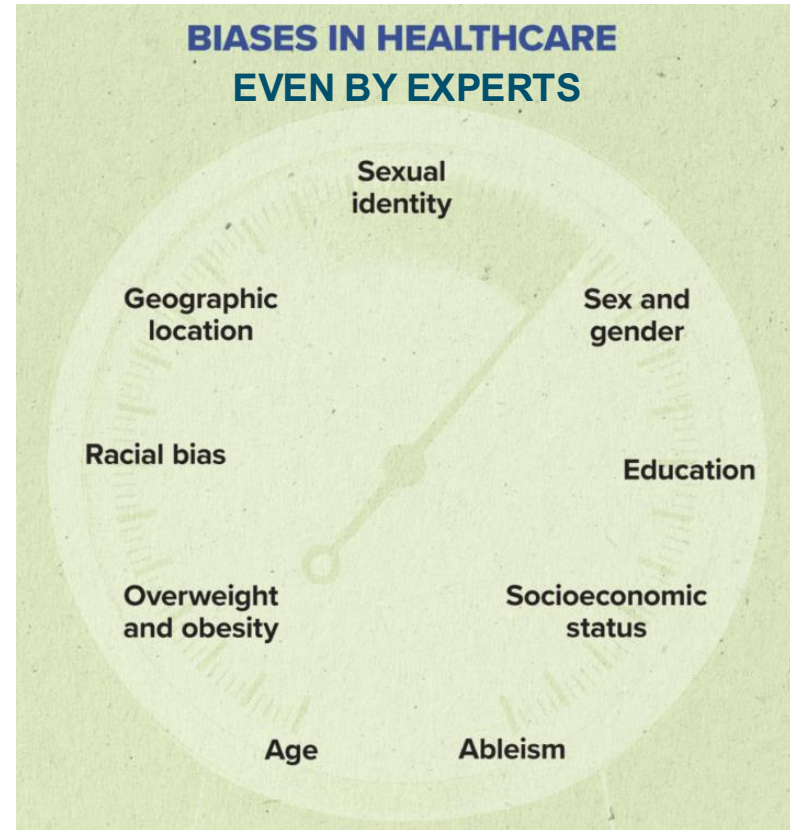


Equity



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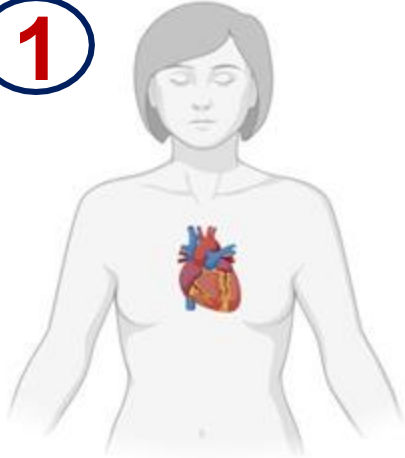
Gender/ethnic diversity leads to better science



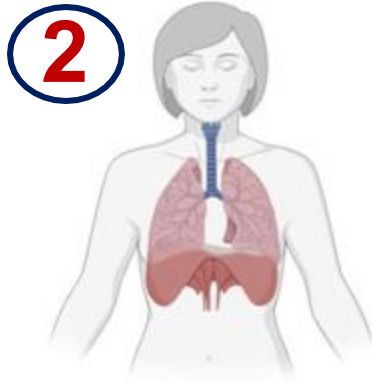
Cardiovascular disease is the leading cause of mortality in women

Total Deaths in Women in USA 2016: 1,236,003

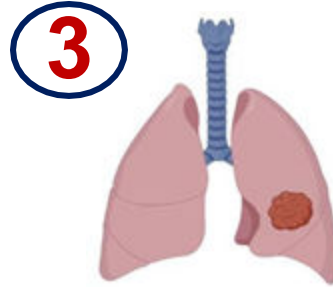
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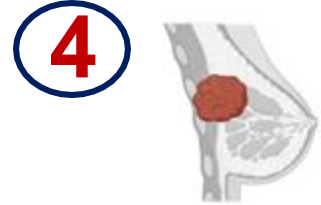
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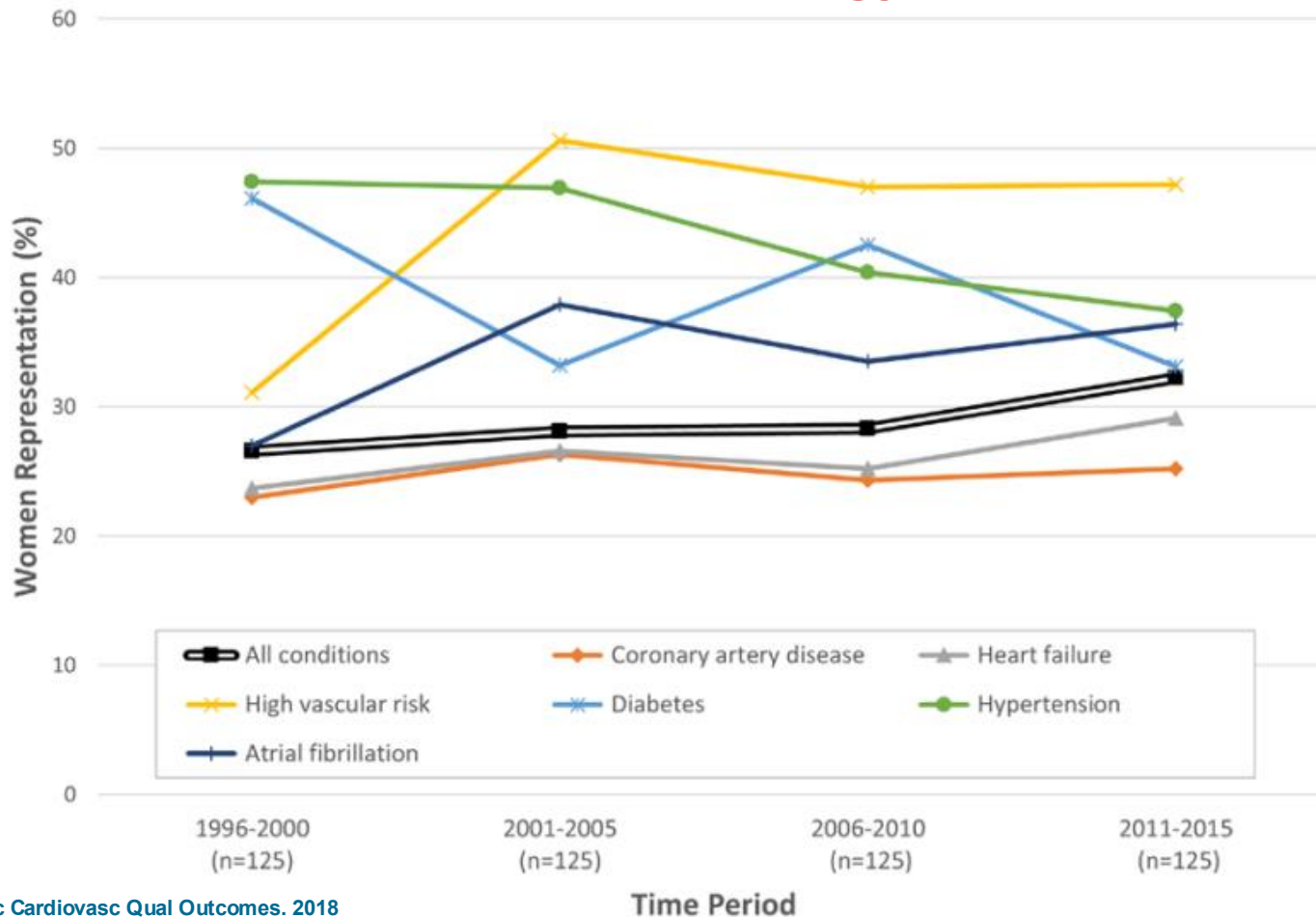
Cardiovascular disease
412,244 deaths

Chronic Lung Disease
81,551 deaths

Lung Cancer
70,500 deaths

Breast Cancer
40,920 deaths

Female representation in cardiology trials over time



FDA still considers women as 'a special subpopulation'

Why do women have greater cardiovascular risk than men?



**7.5 Million deaths
worldwide**

- *Ischaemic heart disease*
- *Stroke*
- *Hypertensive heart disease*

The Problem

Most clinical research done in men.

Public misconceptions that cardiovascular disease affects men more.

Fewer women receive guideline directed therapy.

Different and additional risk factors for women, including hormonal factors.

The Solution

Increased recruitment of women to clinical trials

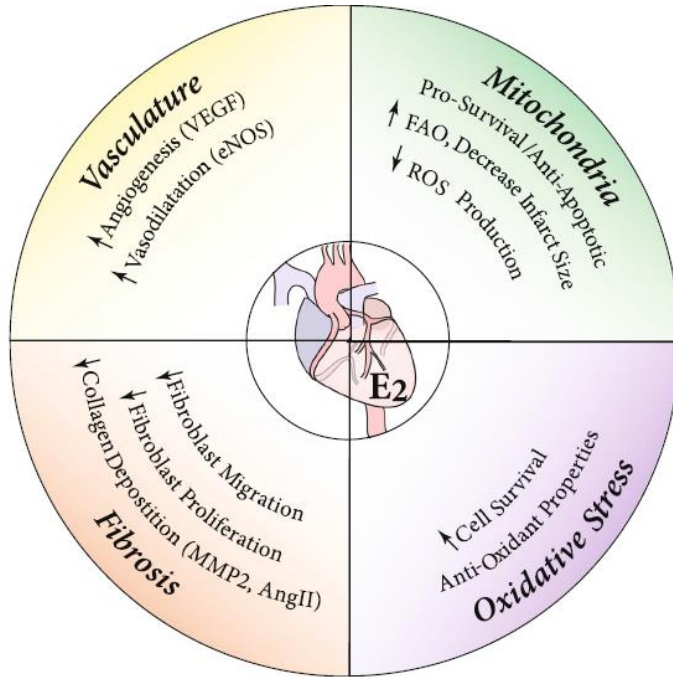
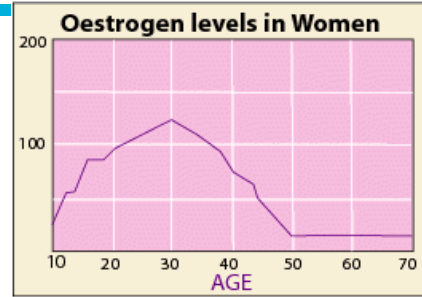
Health promotion and patient education.

Delivering guideline directed therapy for women.

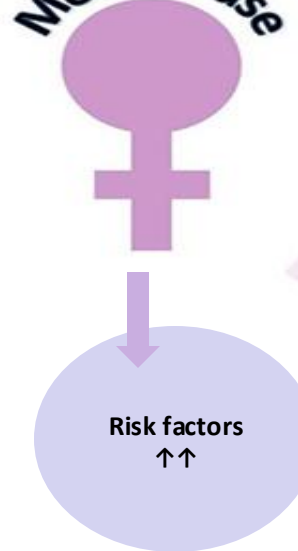
Greater women-centric clinical trials.

Greater research on hormonal influence on cardiovascular risk.

Effects of estrogens pre- and postmenopause:



Menopause



Thrombosis

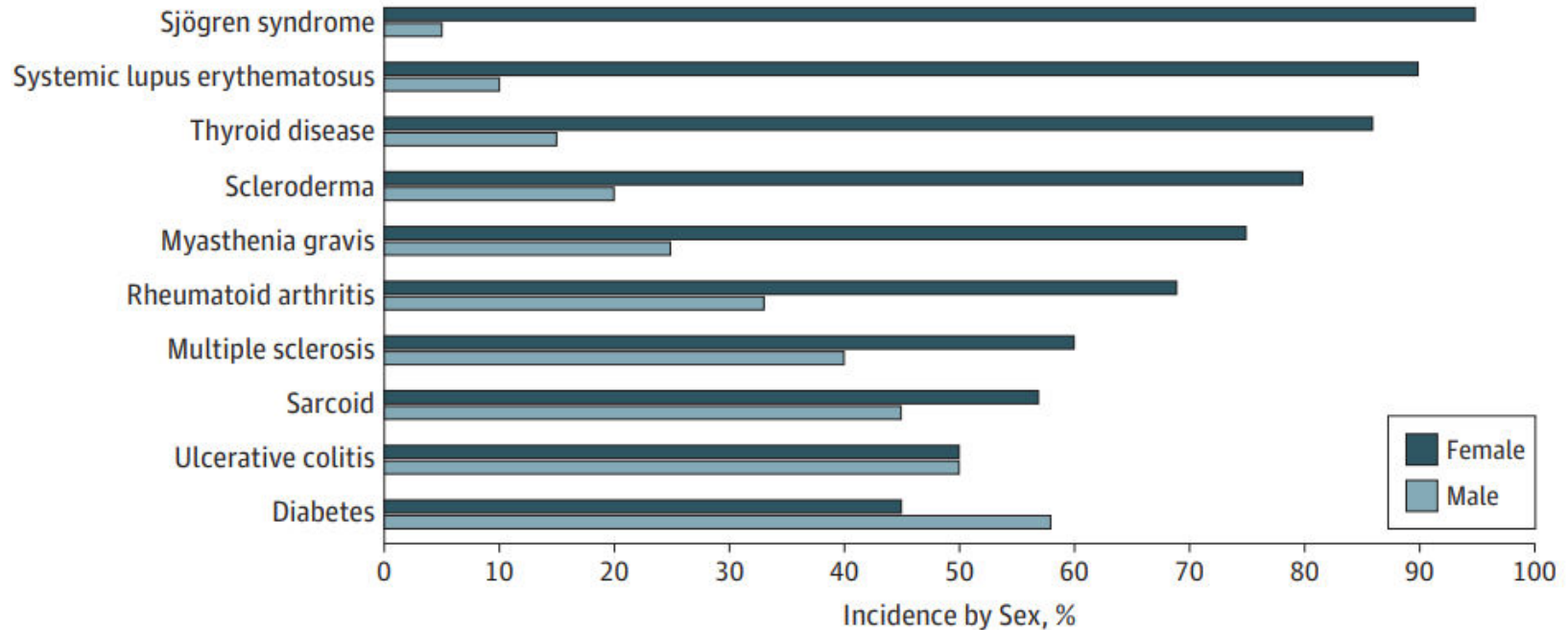
Inflammation

**Hormonal
Dysregulation**

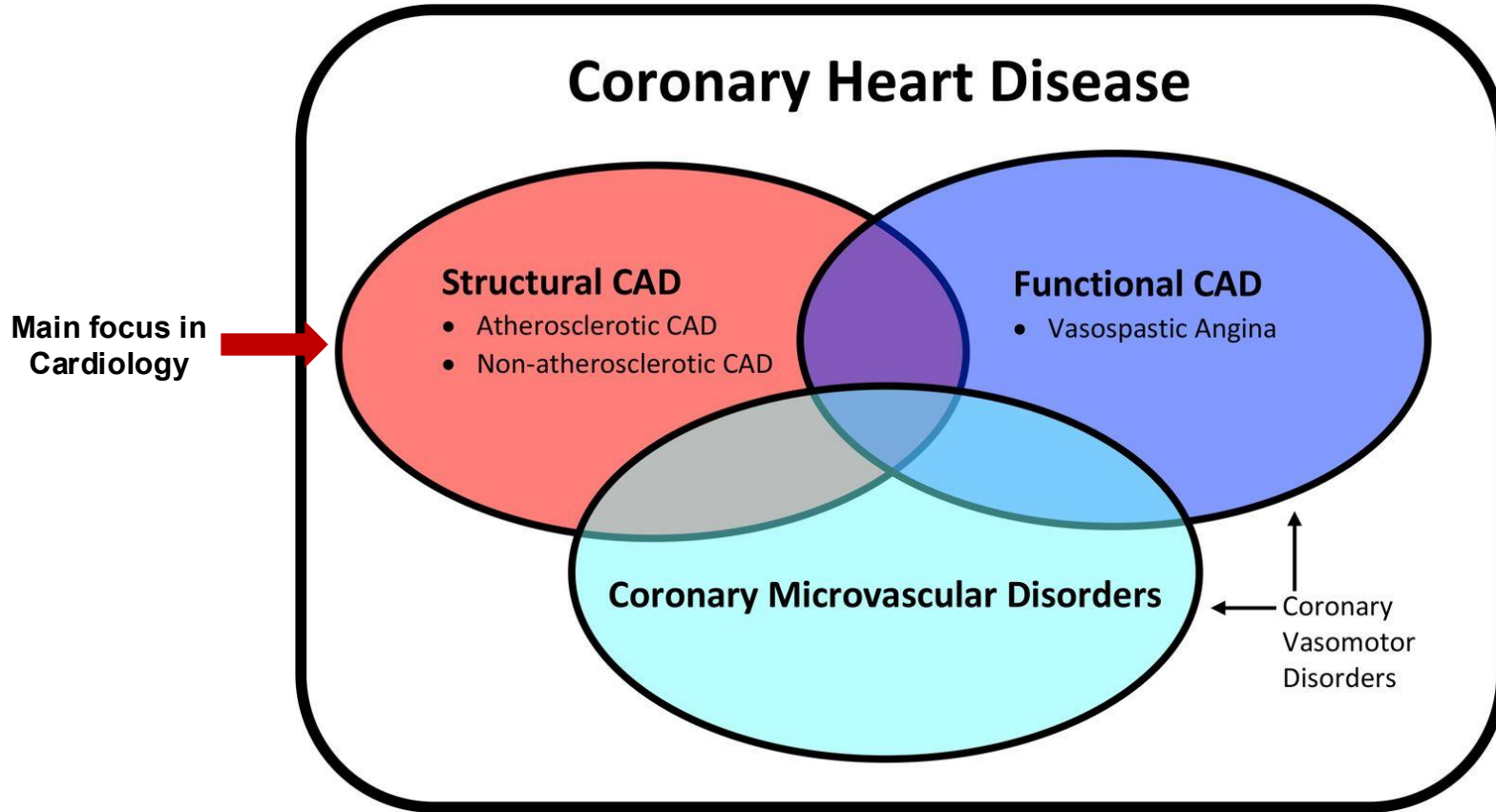
**Sympathetic
tone**



Figure 2. Distribution of Major Autoimmune Diseases by Sex



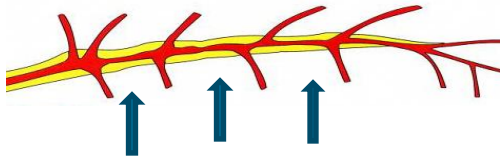
Overview of coronary heart disease



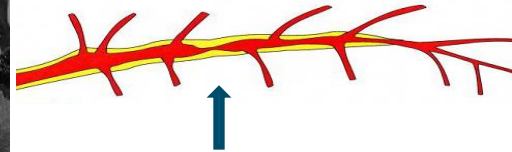
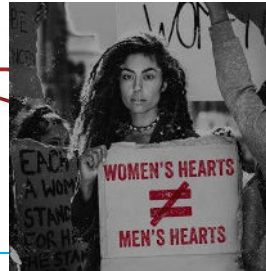
Spasm in the
epicardial and
microvasculature
of the coronary
arteries
(80% women)



Stenoses in the
epicardial
coronary arteries
(80% men)



Diffuse atherosclerosis



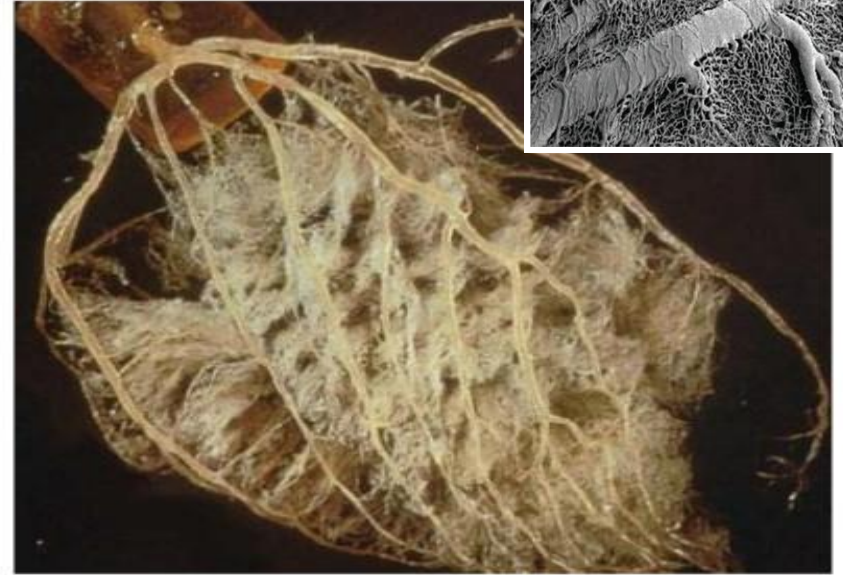
Focal stenosis

The emerging concept of coronary microvascular disease (CMD)

The tip of the iceberg - Resolution >500mm

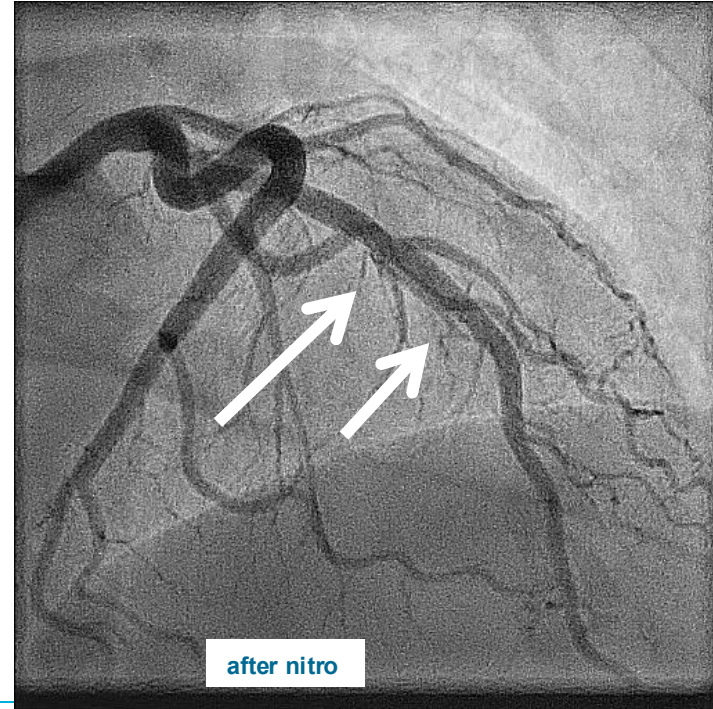
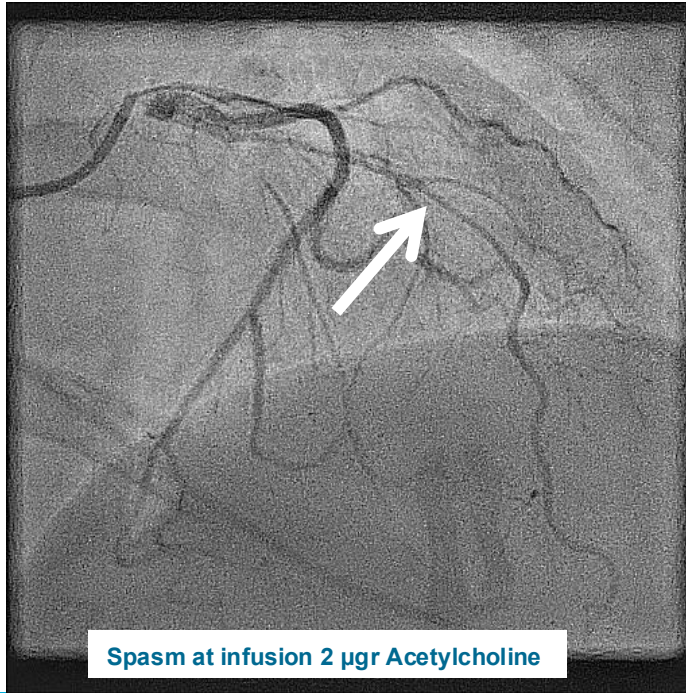


Resolution <500mm



- precursor abnormalities larger coronary arteries
- In 50% women with chest pain at middle- age (WISE) [Bailey Merz CN, et al 2006](#)
- Persistent symptoms → adverse prognosis [Johnson BD, et al 2006](#)

**Woman 46 yrs, since 4 yrs misunderstood symptoms of chest pain.
After 3 CAGs sent to a psychiatrist ...**



Are symptoms in women 'atypical'??



No, symptoms are **characteristic** for the underlying problem

Management of INOCA

1. Lifestyle factors



Nutrition



Exercise



Weight management



Smoking cessation



Coping with stress

2. Risk factor management



Hypertension

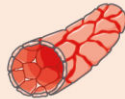


Dyslipidaemia



Diabetes mellitus

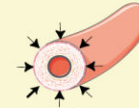
3. Antianginal medication



Microvascular angina

1. Betablocker
2. Calcium channel blocker
3. Nicorandil
4. Ranolazine
5. Ivabradine
6. Trimetazidine

Consider statins and
ACEI/ARB



Vasospastic angina

1. Calcium channel blocker
2. Long-acting nitrate
3. Nicorandil

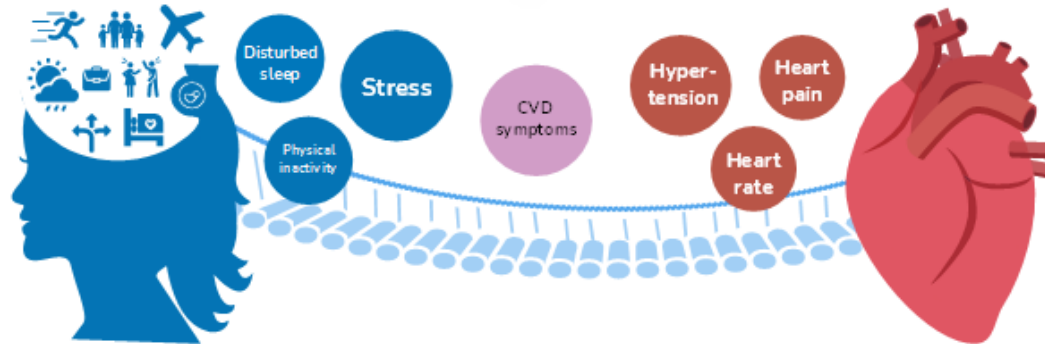
Stress reducing music program on smartphone using biofeedback



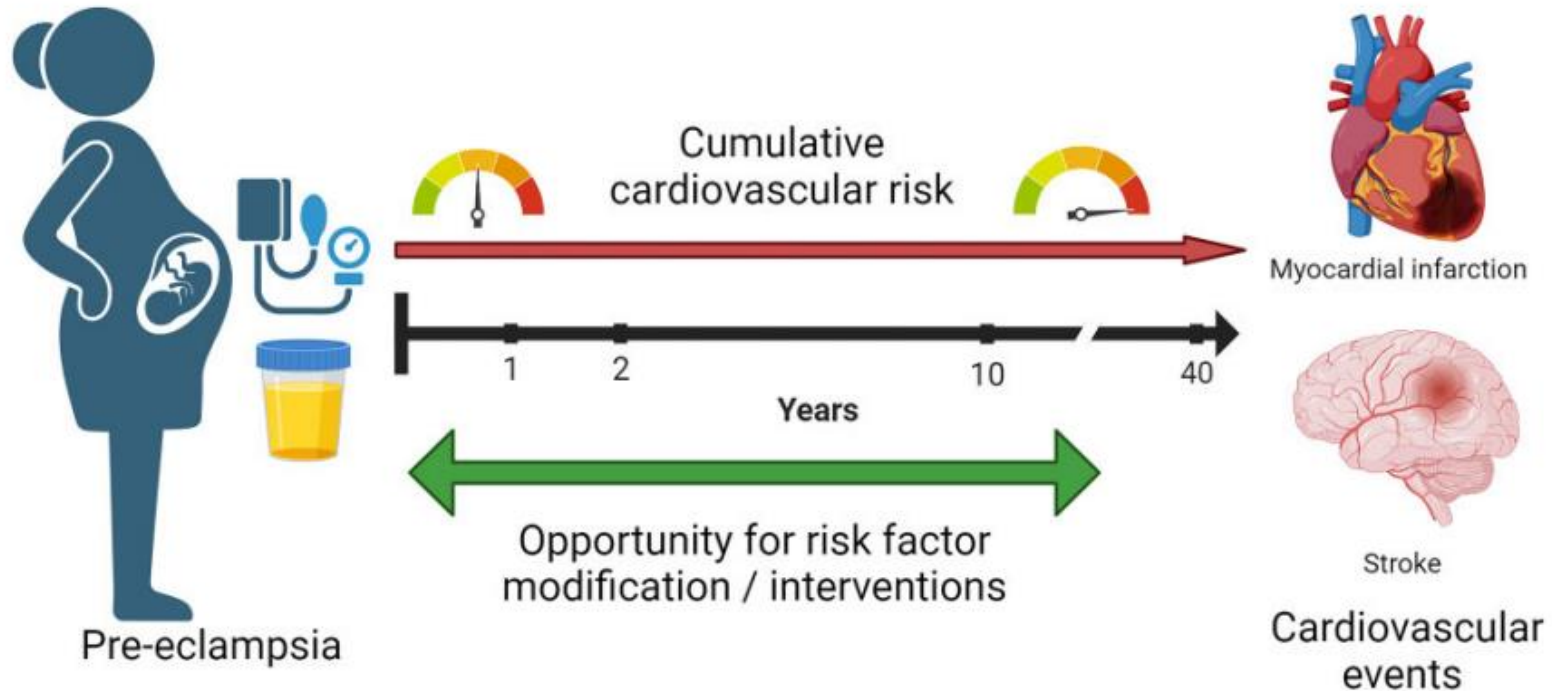
WAVY

Bridges the gap between cardiovascular disease and mental health

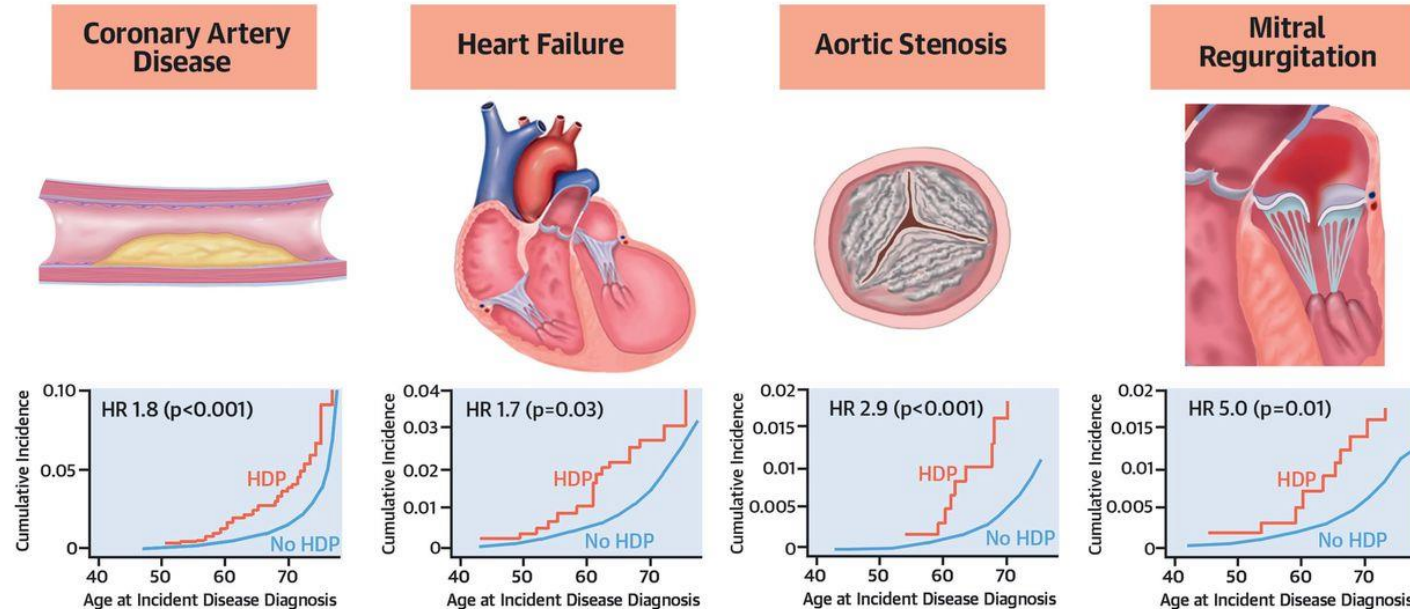
Wavy is a deep tech medical device app that helps heart patients to manage their symptoms and lower their stress. Wavy is first to market in answering the 'How': The same cardiologists who wrote the guideline now use our solution with their patients



Severe hypertension in pregnancy and future heart disease risk:



CENTRAL ILLUSTRATION: Hypertensive Disorders of Pregnancy Are Associated With Long-Term Risk of Diverse Cardiovascular Diseases



Honigberg, M.C. et al. J Am Coll Cardiol. 2019;74(22):2743-54.

Gender-Gap in medication knowledge



| | |
|------------------------------|------------------------|
| High systolic blood pressure | <div><div></div></div> |
|------------------------------|------------------------|



HYPERTENSION

SIGNS AND SYMPTOMS



Symptomatic hypertension is often interpreted as menopause

- fatigue, lack of energy
- continuous chest pain : 'bra feels too tight'
- pain between shoulder blades
- fluid retention : ankles, stomach, hands, eyelids etc
- palpitations, PAF
- shortness of breath
- sweating, hot flushes
- insomnia
- headaches, dizziness

Cardiovascular Risk Assessment

Traditional Risk Factors:

- Hypertension
- Dyslipidemia
- Diabetes
- Obesity
- Smoking
- Sedentary lifestyle
- Family history
- Poor diet
- Environmental pollution

Pregnancy-Related Risk Factors:

- Preeclampsia
- Gestational hypertension
- Gestational diabetes
- Preterm delivery
- Delivery of small for gestation age infant
- Recurrent spontaneous pregnancy loss

Other Female-Specific Factors:

- Early menarche
- Premature menopause
- Hormone-based contraception
- Polycystic ovarian syndrome
- Autoimmune disorders
- Chronic inflammatory conditions
- Depression and other mental health conditions

Social Determinants of Health

Cultural Issues and Norms

Language and Health Literacy

Race and Ethnicity Contribution

Heterogeneity within each of these populations resulting in variation in risk factors and CVD impact
Underrepresentation in treatment trials and as a result inadequate data on optimal treatments to reduce CVD risks

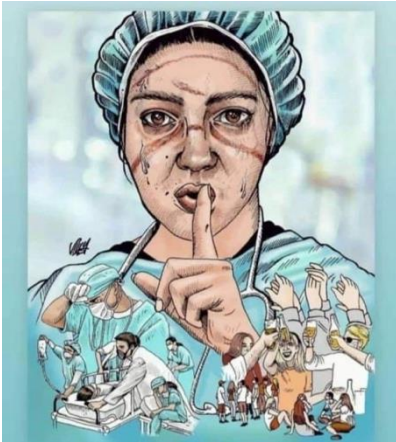
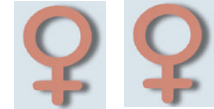
Healthcare is on the shoulders of many women



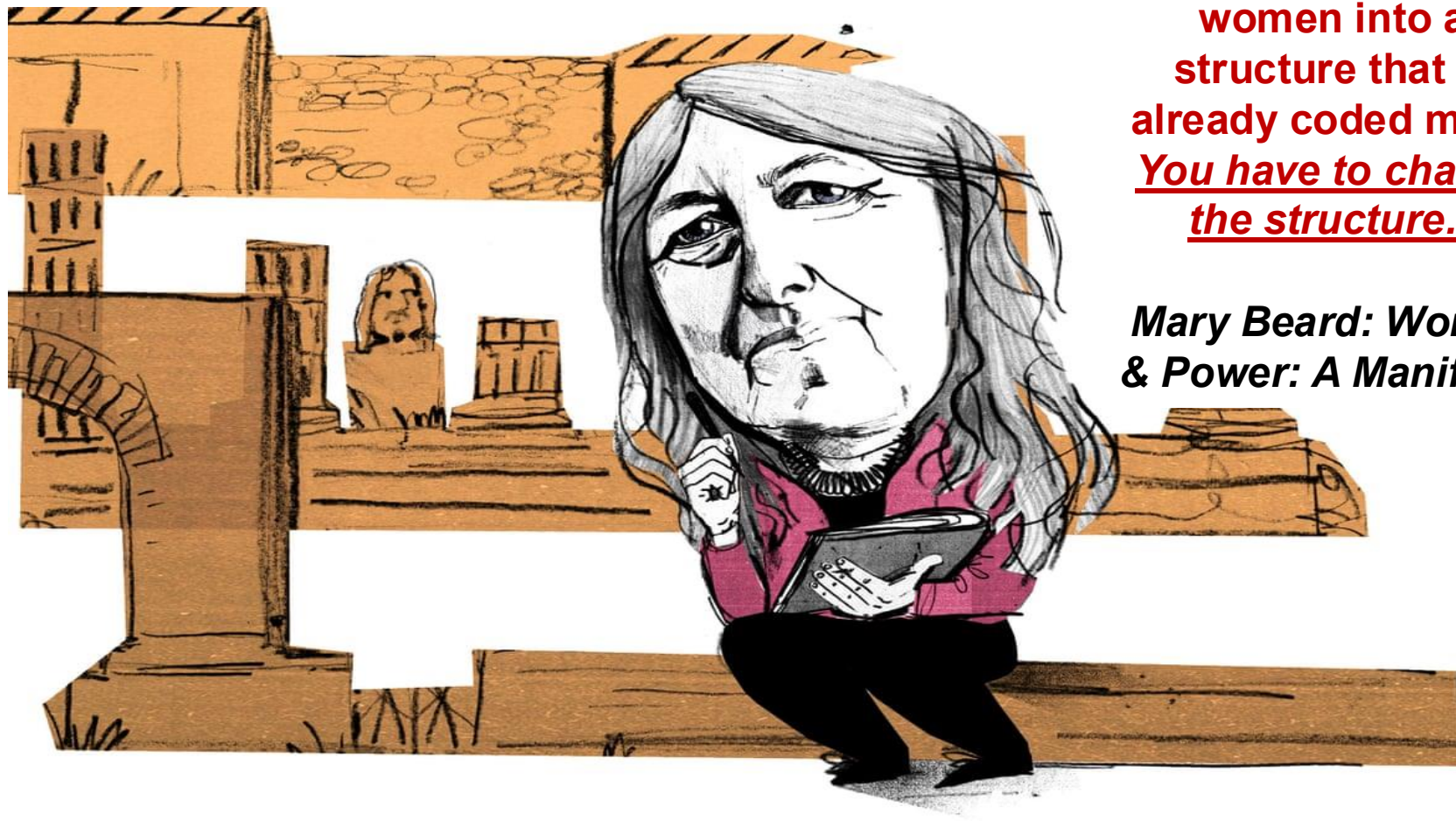
WHI report 2019:

>70% Healthcare workers →

< 25% leading force Healthcare →



- Lower paid jobs healthcare
- Single mom households
- Lower education level
- More domestic violence
- Care for parents, etc etc

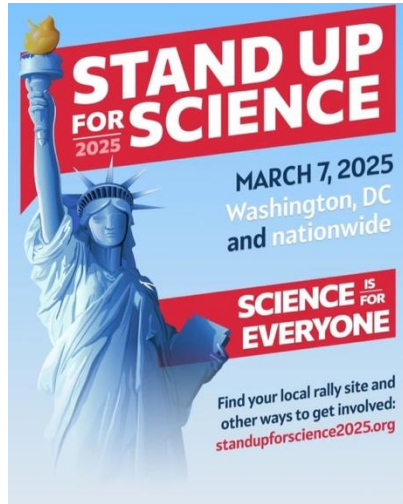


***“You cannot easily fit
women into a
structure that is
already coded male;
You have to change
the structure.”***

***Mary Beard: Women
& Power: A Manifesto***

White House launches **prohibited words** list including 'women' and 'disabled'

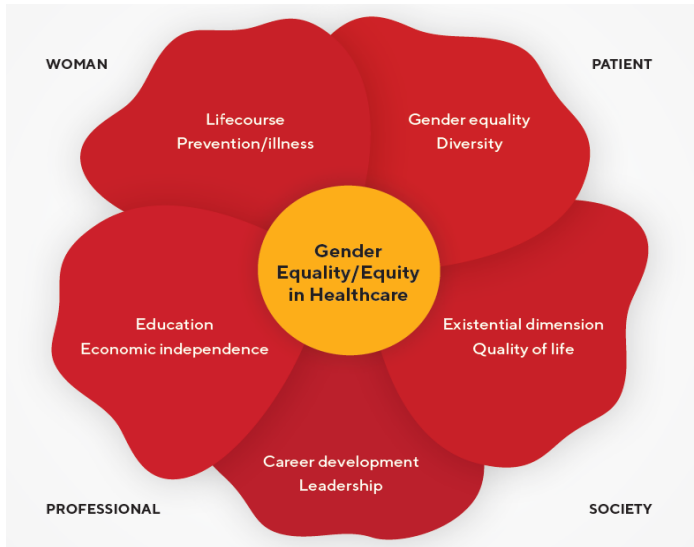
Febr. 2025

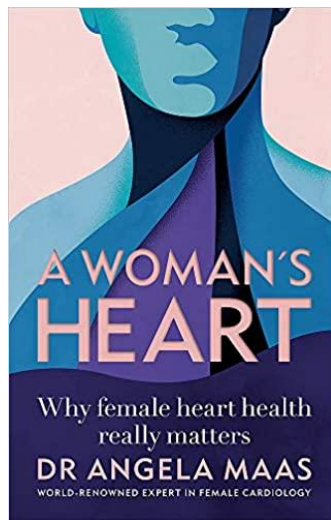


HEY DONALD!

| | | |
|------------------|-----------------|-----------------|
| inclusive | underprivileged | health equity |
| affirming care | stereotype | implicit bias |
| anti-racism | transgender | inclusivity |
| Enola Gay | diversity | DEIA |
| black | they/them | Latinx |
| climate change | pronouns | LGBTQ |
| barriers | race | mental health |
| science | ethnicity | multicultural |
| truth | pregnant people | minorities |
| equity | inequality | racial identity |
| racial disparity | person-centered | segregation |
| empathy | orientation | stereotypes |
| DEI | prejudice | victims |
| disability | non-binary | vulnerable |
| women | gay man | belonging |
| tribal | immigrants | marginalize |
| underserved | history | key groups |
| transsexual | Gulf of Mexico | hate speech |
| systemic | gender identity | feminism |
| social justice | inequitable | equality |

More women in the lead to make changes happen





DE GEZONDHEIDSZORG VOOR VROUWEN MOET VERBETEREN

De geneeskunde is van oudsher gebaseerd op de man, met vrouwen als een soort bijvangst, maar vrouwen zijn géén kleine mannen. In wetenschappelijk onderzoek blijven vrouwelijke patiënten ondanks de kennistoename schrikbarend ondervertegenwoordigd. Anno 2024 is bij artsen nog steeds geen volledige gelijkwaardigheid tussen mannen en vrouwen als patiënt, ondanks groeiende feitenkennis over de verschillen. Ook de positie van vrouwelijke professionals is ondergeschikt en niet meer van deze tijd.

Cardioloog Angela Maas en auteur Els Quaegebeur onderzoeken deze gezondheidskloof: waar zitten de systeemfouten in de gezondheidszorg voor vrouwen? Wat zijn de misvattingen en (voor)oordelen en waarom blijven veel wezenlijke verschillen onderbelicht? Hoe kunnen we de huidige zorgcultuur snel vrouwvriendelijker maken?



Angela Maas is cardioloog en pionier op het terrein van betere cardiologische zorg voor vrouwen. In 2020/21 was ze yn-vertegenwoordiger namens de Nederlandse Vrouwenraad. Ze schreef eerder *Hart voor vrouwen*.



Els Quaegebeur is journaliste en auteur van fictie en non-fictie, onder meer van *Leven toevoegen aan de dagen* (met langarts Sander de Hossen).

De pers over *Hart voor vrouwen*:

'Dit boek verdient het om breed gelezen te worden: door vrouwen, door artsen, door iedereen.'
de Volkskrant

'Het vrouwenhart is lang tekortgedaan.'
Trouw

'Een eyeopener.'
Medisch Contact

ANGELA MAAS EN
ELS QUAEGEBEUR

DE GEZONDHEIDSKLOOF

arbeiderspers.nl



ANGELA MAAS EN ELS QUAEGEBEUR DE GEZONDHEIDS- KLOOF

WAAROM VROUWEN NOG STEEDS
OP ACHTERSTAND STAAN

