



GENDER DISPARITIES IN CARDIOVASCULAR DISEASE

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DISCLOSURES

- Sara Richter has no relevant conflicts of interest or disclosures

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OBJECTIVES

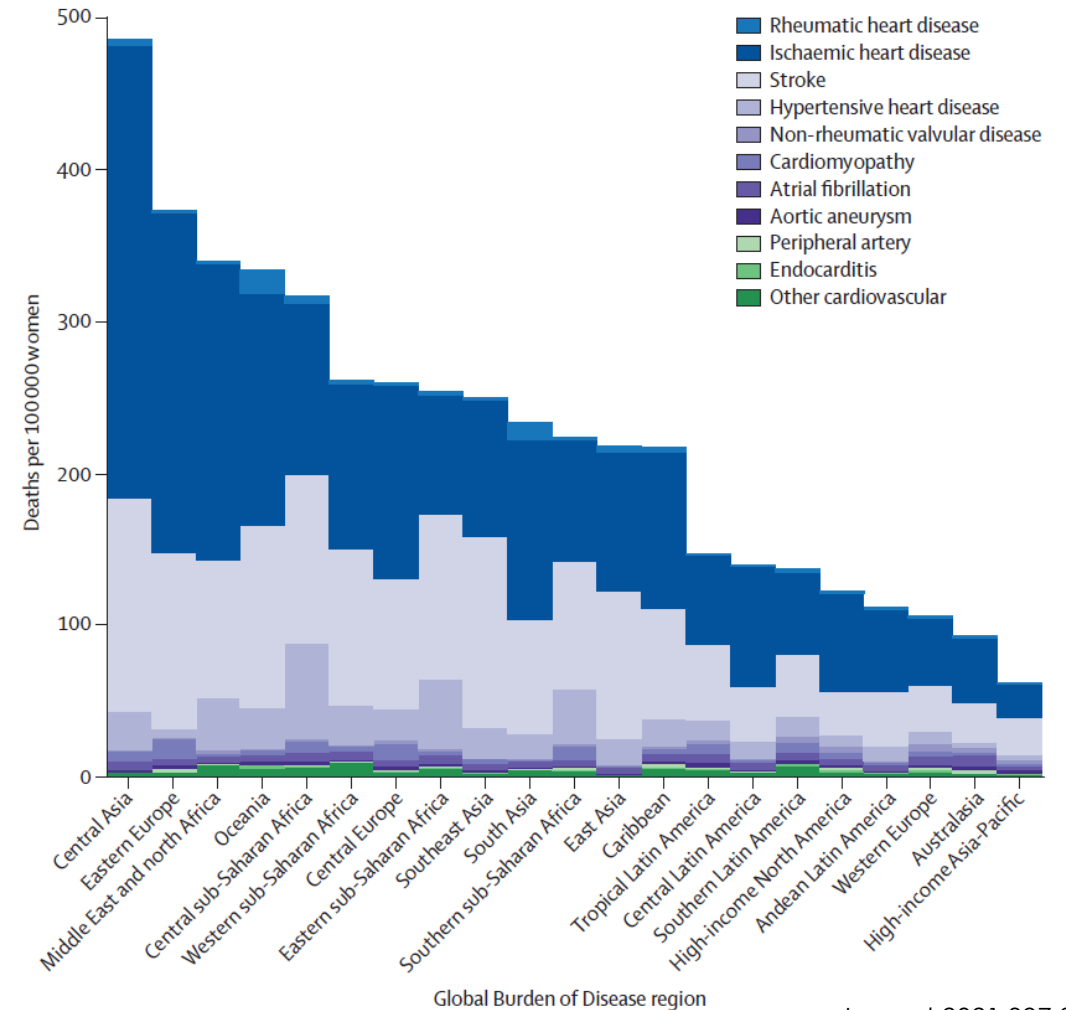
- Describe sex/gender differences in the prevalence of cardiovascular disease.
- Describe sex/gender differences in the management of cardiovascular disease.
- Identify ways to reduce sex/gender disparities in the prevention and/or treatment of cardiovascular disease.

PREVALENCE OF CARDIOVASCULAR DISEASE

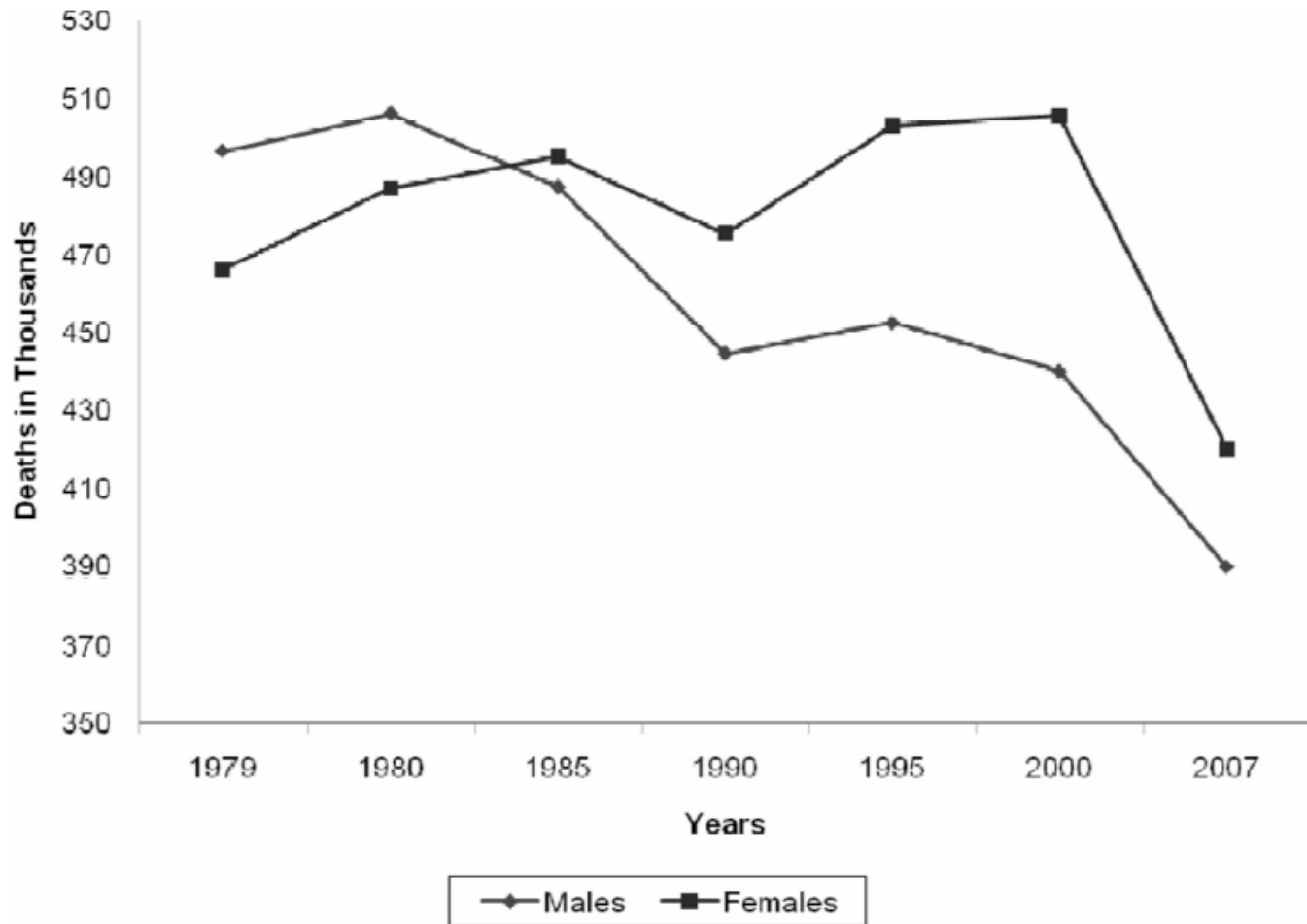
- Prevalence of CVD
 - 275 million women diagnosed with CVD in 2019
 - 8.9 million women died from CVD in 2019
 - 35% of all deaths in women worldwide are caused by CVD (#1 cause of death)

DEATHS ATTRIBUTABLE TO CVD

- Ischemic heart disease and stroke are the top two causes of CVD mortality.



DEATHS ATTRIBUTABLE TO CVD



Number of deaths: 421,918
Age-adjusted CVD death rate per 100,000: 211.6
Number of deaths: 391,886
Age-adjusted CVD death rate per 100,000: 300.3

AWARENESS OF CVD RISK IN WOMEN

- Risk assessment tools may not accurately predict risk in women
- Survey from 2014:
 - 39% of primary care physicians rated CVD in women as the top concerns after weight and breast health
 - 22% of primary care physicians felt extremely well prepared to assess CVD risk in women
 - 16% of primary care physicians said they comprehensively implemented CVD prevention guidelines when treatment women

WELL-ESTABLISHED RISK FACTORS FOR CVD

- Hypertension*
 - Obesity*
 - Dyslipidemia*
 - Diabetes
 - Unhealthy diet
 - Sedentary lifestyle
 - Smoking or tobacco use
- Top risk factors contributing to years of life lost from CVD

WELL-ESTABLISHED RISK FACTORS FOR CVD

Specific to the United States

- CVD is prevalent in 44.7% of women aged 20 years or older
 - Hypertension prevalence is 58% in women aged 65-74 years
 - 30% of women over 20 years have LDL cholesterol of at least 130 mg/dL
 - 67.4% of US women are considered overweight or obese (40.7% are obese)
 - 13 million adults women have diabetes

CVD: cardiovascular disease

LDL: low-density lipoprotein

US: United States

SEX-SPECIFIC RISK FACTORS FOR CVD

- Women:
 - Premature menopause
 - Health problems during pregnancy (gestational diabetes, hypertensive disorders of pregnancy, preterm delivery)
 - Polycystic ovary syndrome
 - Inflammatory diseases
 - Breast cancer
 - Oral birth control + smoking

UNDER-RECOGNIZED RISK FACTORS FOR CVD

- Psychosocial risk factors (e.g. depression)
- Abuse and intimate partner violence
- Socioeconomic deprivation
- Poor health literacy
- Environmental risk factors

ISCHEMIC HEART DISEASE

- Known Disparities:
 - Lower rate of diagnostic testing/specialty care
 - Less likely to receive guideline directed medical therapy
 - Fewer achieve door-to-balloon time \leq 90 minutes
- Reasons for Sex/Gender Disparities:
 - Higher prevalence of ischemia with non-obstructive coronary arteries and other less studied diseases
 - Differences in STEMI presentation and care

ISCHEMIC HEART DISEASE


- Result of Disparities:
 - Myocardial infarction: 1.5x higher 1-year mortality than men
 - In-hospital mortality for STEMI in females is 7.4% vs. 4.6% for men
 - In-hospital mortality for NSTEMI in females is 4.8% vs. 3.9% for men
 - CABG: 2x higher morbidity and mortality compared to men
 - Angina: 2x higher morbidity and mortality compared to men

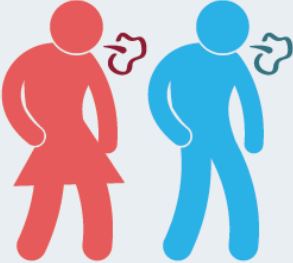
STEMI: ST-segment elevation myocardial infarction
NSTEMI: non- ST-segment elevation myocardial
infarction


ISCHEMIC HEART DISEASE

- Easy thing to do: Increase awareness of symptoms


MOST COMMON...


 Chest pain


 Shortness of breath


 Discomfort or tingling in arms, back, neck, shoulder or jaw


WOMEN MAY ALSO REPORT...


 Heartburn-like feeling

 Unusual tiredness

 YAWN!

 Sudden dizziness

 Nausea or vomiting

 Cold sweat

KNOW THE SIGNS

OTHER SEX/GENDER DISPARITIES IN CVD

- Higher death rate from hypertension
- 1.5x higher incidence of heart failure compared to men
- Greater morbidity and mortality post stroke
- Lower rate of oral anticoagulation for new atrial fibrillation
- Lower statin prescription rate

REPRESENTATION IN CLINICAL TRIALS

- CVD is understudied, under-recognized, underdiagnosed, undertreated, and women are under-represented in clinical trials

Trial	Treatment Arms	Female Representation
SOLVD <i>N Engl J Med</i> 1991; 325:293-302	Enalapril Placebo	19.1% 20.2%
MERIT-HF <i>Lancet</i> 1999; 353:2001-2007	Metoprolol XL Placebo	23% 22%
RALES <i>N Engl J Med</i> 1999; 341:709-717	Spiroonolactone Placebo	27% 27%
PARADIGM-HF <i>N Engl J Med</i> 2014; 371:993-1004	LCZ696 (Entresto) Enalapril	21% 22.6%
DAPA-HF <i>N Engl J Med</i> 2019; 381:1995-2008	Dapagliflozin Placebo	23.8% 23%

REPRESENTATION IN CLINICAL TRIALS

- Reasons for sex/gender disparities:
 - Historical FDA recommendations
 - Perceived differences in probability of benefit and harm
 - Concerns about time

RECOMMENDATIONS FOR FUTURE CVD TRIALS IN WOMEN

- Equal representation of women and men unless adequately justified
- Various analyses reported/evaluated by gender:
 - Quality-of-life
 - Efficacy and safety
 - Nonadherence (and reasons why)
 - Cost-effectiveness
- Gender-specific power calculations

STRATEGIES TO INCREASE WOMEN IN CVD TRIALS

- Be inclusive
- Meet women where they are
- Exchange knowledge
- Remove barriers

KEY RECOMMENDATIONS TO REDUCE DISPARITIES

- Close knowledge gaps
- Enhance awareness of CVD in women
- Target well established, sex-specific, and under-recognized risk factors
- Strengthen health-care systems and engage health-care professionals

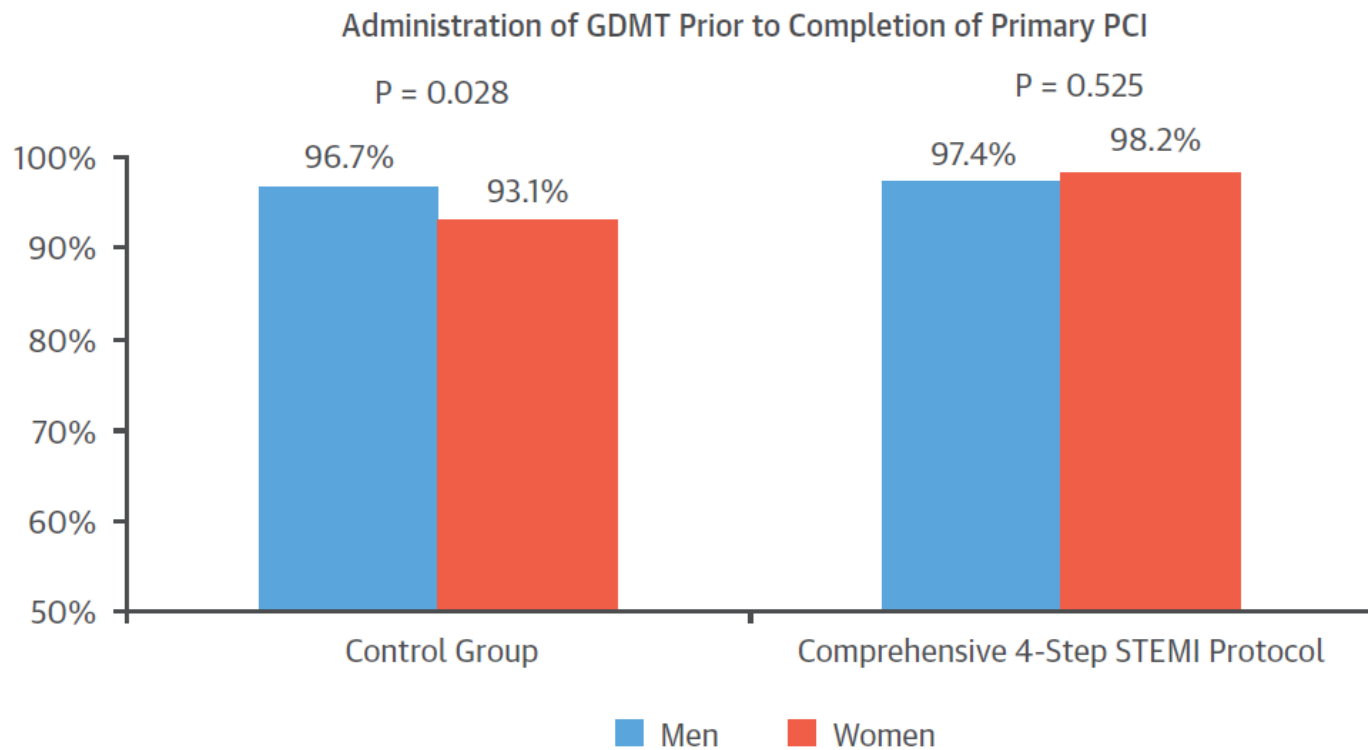
EXAMPLES OF SYSTEM-BASED APPROACH

4-Step Protocol for Disparities in STEMI Care and Outcomes in Women

Huded CP, et al.

- Implementation of a protocol for all patients:
 1. Emergency department catheterization lab activation
 2. STEMI Safe Handoff Checklist
 3. Immediate transfer to an immediately available catheterization lab
 4. Radial first approach to percutaneous coronary intervention

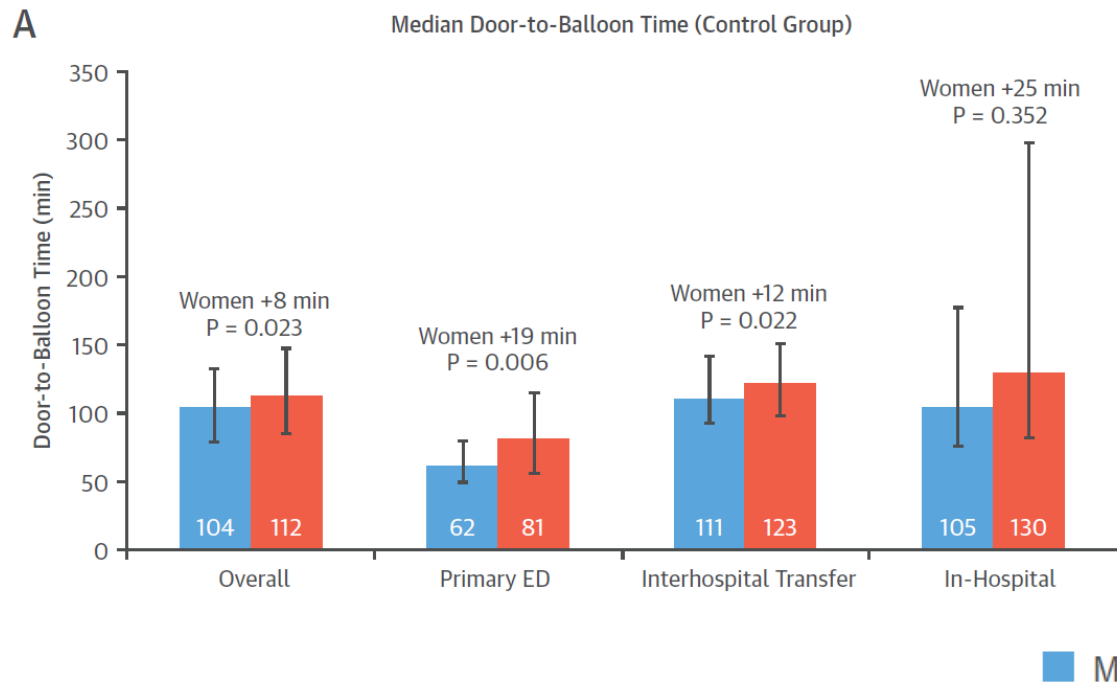
4-STEP PROTOCOL FOR DISPARITIES IN STEMI CARE AND OUTCOMES IN WOMEN



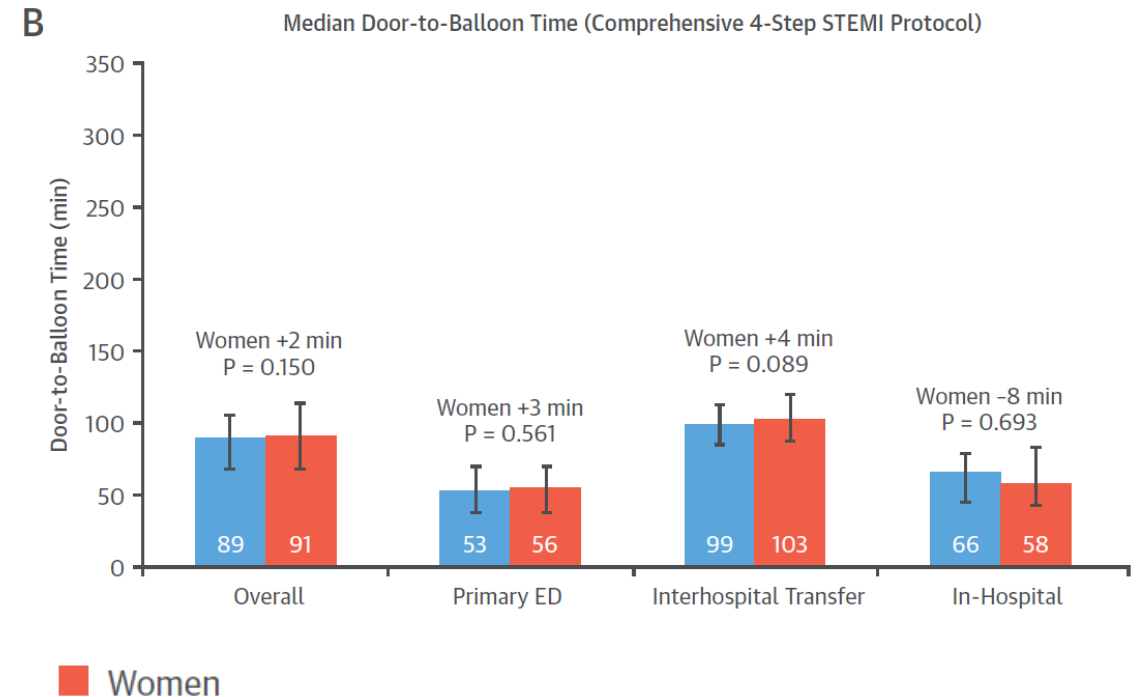
GDMT: guideline-directed medical therapy
PCI: percutaneous coronary intervention
STEMI: ST-segment elevation myocardial infarction

4-STEP PROTOCOL FOR DISPARITIES IN STEMI CARE AND OUTCOMES IN WOMEN

Pre-Implementation



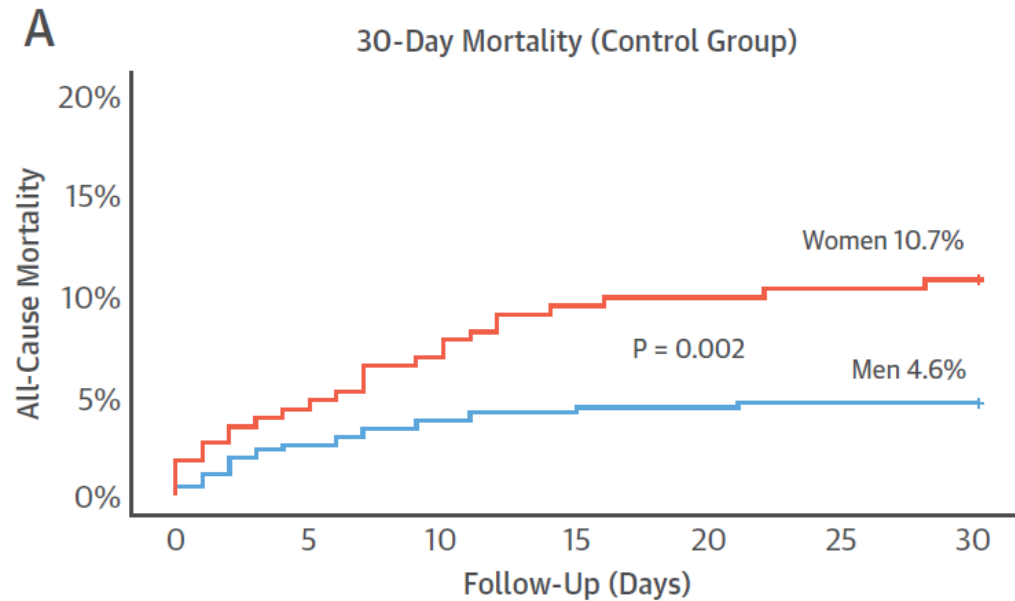
Post-Implementation



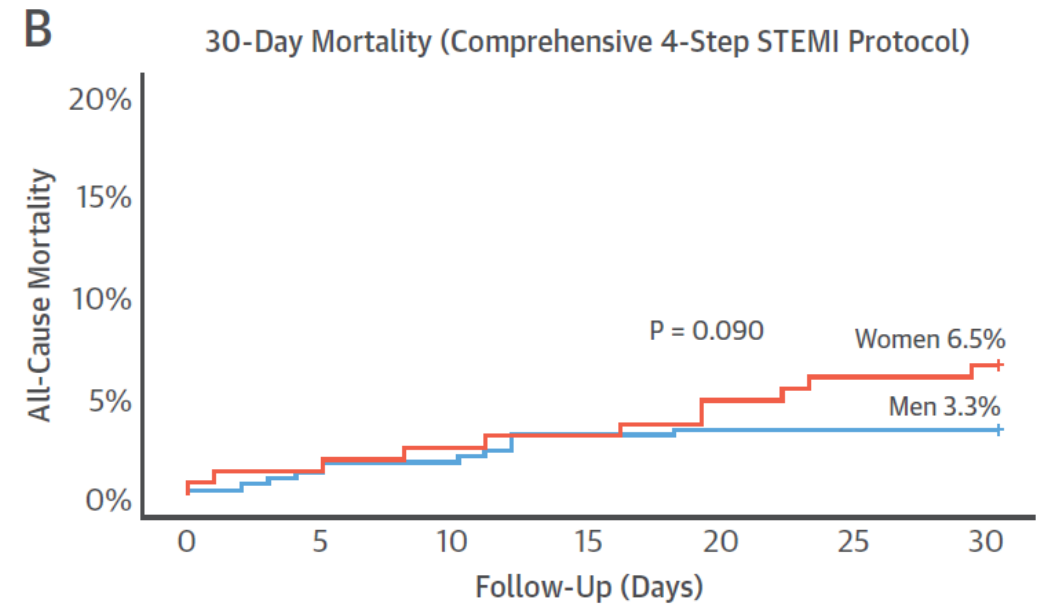
ED: emergency department
STEMI: ST-segment elevation myocardial infarction

4-STEP PROTOCOL FOR DISPARITIES IN STEMI CARE AND OUTCOMES IN WOMEN

Pre-Implementation



Post-Implementation



POST-TEST QUESTION #1

1. What percentage of deaths in women are due to CVD?
 - a. 10-20%
 - b. 25-35%
 - c. 40-50%
 - d. 55-65%

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POST-TEST QUESTION #2

2. Which statement about the management of CVD in women is true? Compared to men, women:
- a. have lower bleed risk with oral anticoagulation.
 - b. are less likely to receive GDMT.
 - c. have higher statin prescription rates.
 - d. are more likely to achieve a door-to-balloon time less than 90 minutes.

CVD: cardiovascular disease

GDMT: guideline-directed medical therapy

POST-TEST QUESTION #2

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GDMT: guideline-directed medical therapy

POST-TEST QUESTION #3

3. True or false: Women usually present with similar signs/symptoms of ischemic heart disease compared to men.
 - a. True
 - b. False

POST-TEST QUESTION #3

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 - a. True
 - b. **False**

POST-TEST QUESTION #4

4. Which strategy/strategies can help reduce gender disparities in CVD?
 - a. System-based approaches
 - b. Increased representation of women in clinical trials
 - c. Better awareness of CVD risk factors in women
 - d. All of the above

POST-TEST QUESTION #4

4. Which strategy/strategies can help reduce sex/gender disparities in CVD?
 - a. System-based approaches
 - b. Increased representation of women in clinical trials
 - c. Better awareness of CVD risk factors in women
 - d. **All of the above**

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