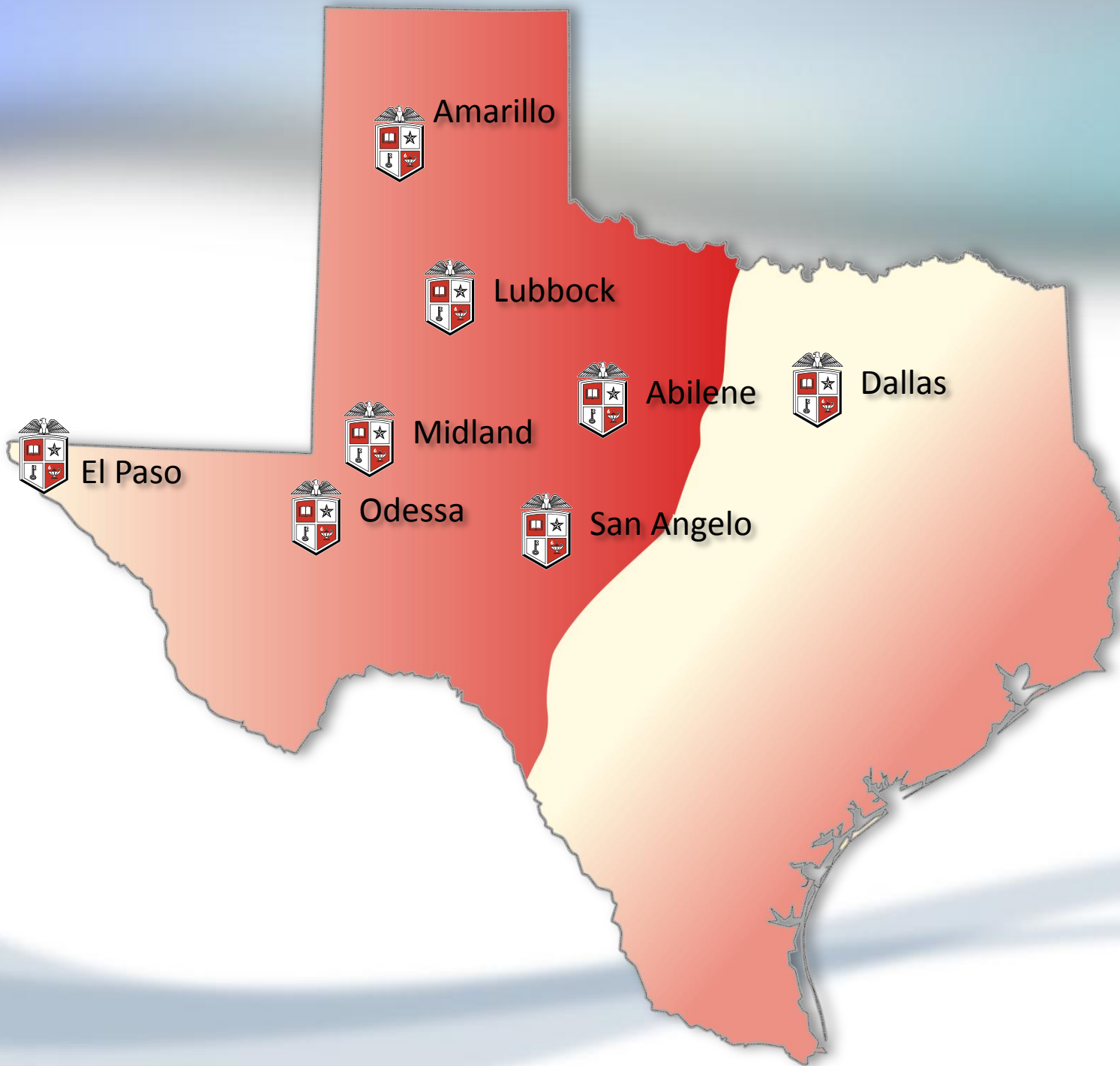


# Gender Health Disparities and Clinical Implications

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Director, Women's Health Fellowship Program  
Center for Women's Health and Gender-Based Medicine  
Texas Tech University Health Sciences Center



Amarillo



Lubbock



Abilene



Dallas



Midland



El Paso



Odessa



San Angelo



# Health Disparities: Definition

“Health disparities are differences in the incidence, prevalence, mortality, burden of diseases and other adverse health conditions or outcomes that exist among specific population groups in the United States. ”

*National Institutes of Health, 1999*

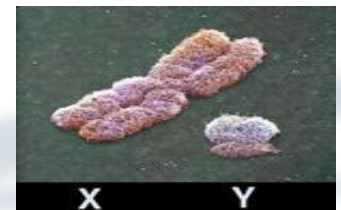
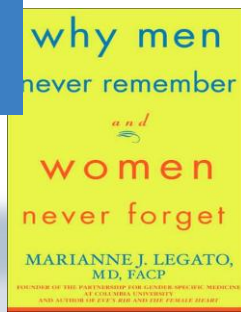
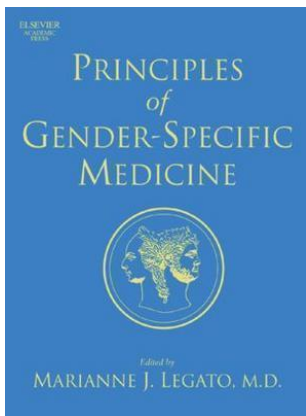
# Basis of Health Disparities

- Gender
- Age
- Ethnicity
- Socioeconomic status
- Geography
- Sexual orientation
- Disability or special health care needs

# Determinants of Health Disparities

- Natural, biological variation
- Inadequate access to essential health and other basic services
- Transient health advantage of one over another (first adopters of health promoting behavior)
- Health damaging behavior: no restriction on lifestyle choices
- Health damaging behavior: degree of lifestyle choices is severely restricted
- Exposure to unhealthy, stressful living and working conditions
- Natural selection (health related mobility) .... Sick people tend to move down the social scale.

Gender-Specific medicine  
the *science* of how normal function and the  
experience of disease is influenced by the sex of  
the patient.



# Gender and Sex: Definition

- **Gender:** introduced in the 1970s as an alternative to 'sex'
- **Gender:** a social construct
- **Sex:** a biological term

# Sex, Gender & Health

- Explanations for many population and individual level health outcomes are not attributable to biology
- Income, income inequality, social connectedness, and social capital all show some association with health and illness

Sex and gender health association is a complex intertwined relationship



# Overview



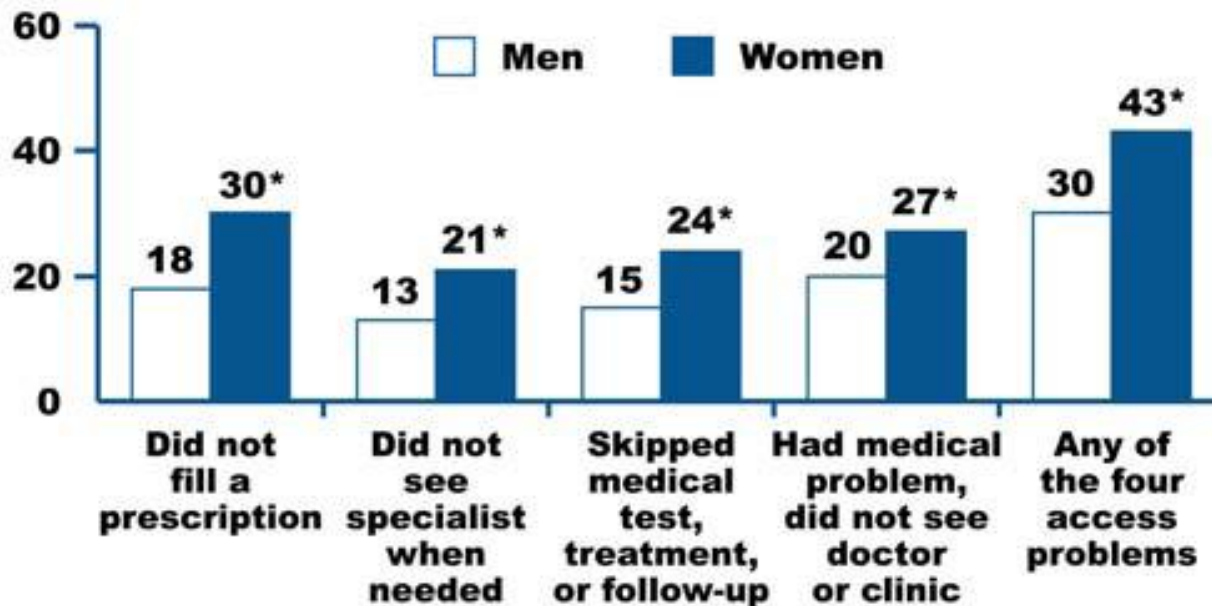
# Access & Quality

# Socioeconomic Disparity

- Below 100% of the Poverty Level (19-64 yo)
  - Women: 17%
  - Men: 13%
- Median earnings (>15 yo)
  - Women: \$22,224
  - Men: \$32,486
- Women earn 76.5 cents/\$1.00 compared to men

## Figure 7. Women Are More Likely Than Men to Have Access Problems in Past Year Because of Cost

Percent of adults ages 19–64 reporting the following problems in past year because of cost

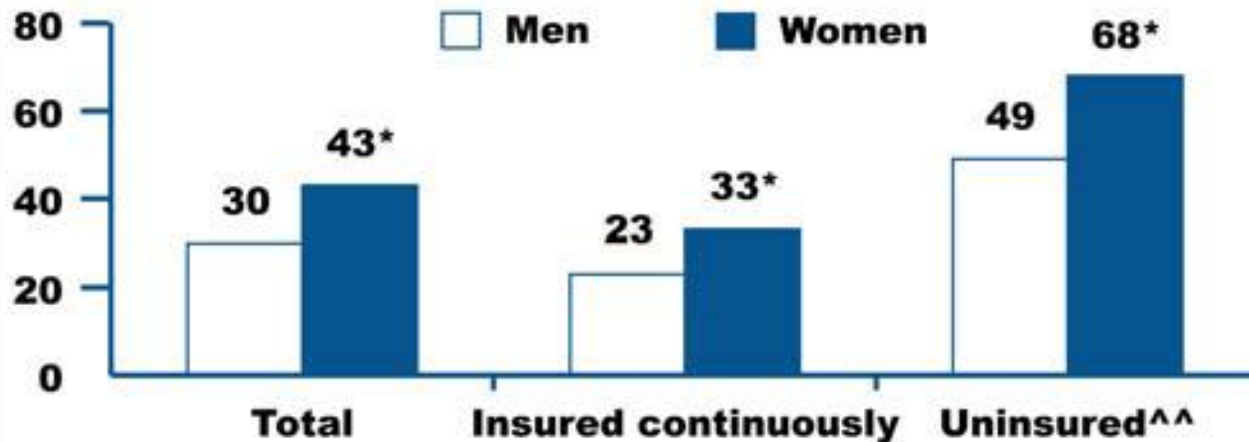


\* Difference between men and women is significant at  $p \leq 0.05$  or better.

Source: The Commonwealth Fund Biennial Health Insurance Survey (2005).

## Figure 6. Women Are More Likely Than Men to Have Cost-Related Access Barriers

Percent of adults ages 19–64 who have difficulty accessing health care<sup>^</sup>



\* Difference between men and women is significant at  $p \leq 0.05$  or better.

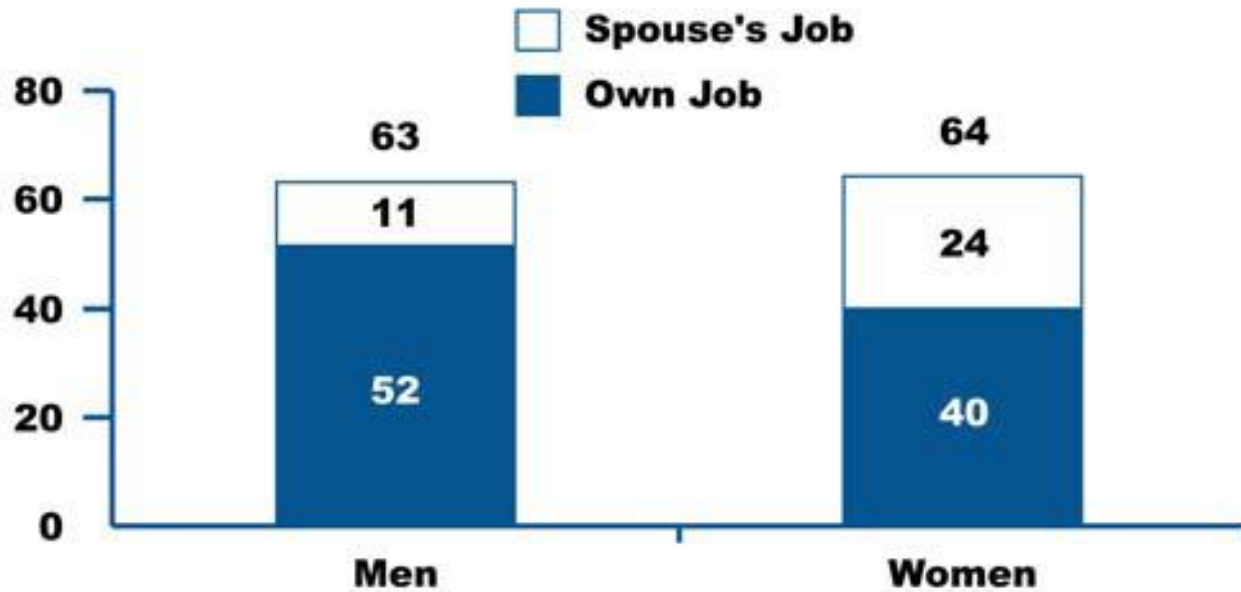
<sup>^</sup> Did not fill a prescription; did not see a specialist when needed; skipped recommended medical test, treatment, or follow-up; had a medical problem but did not visit doctor or clinic.

<sup>^^</sup> Uninsured combines currently uninsured and currently insured but had a time uninsured in the past 12 months.

Source: The Commonwealth Fund Biennial Health Insurance Survey (2005).

### Figure 3. Women Are More Likely to Have Employer-Sponsored Insurance Through Their Spouses

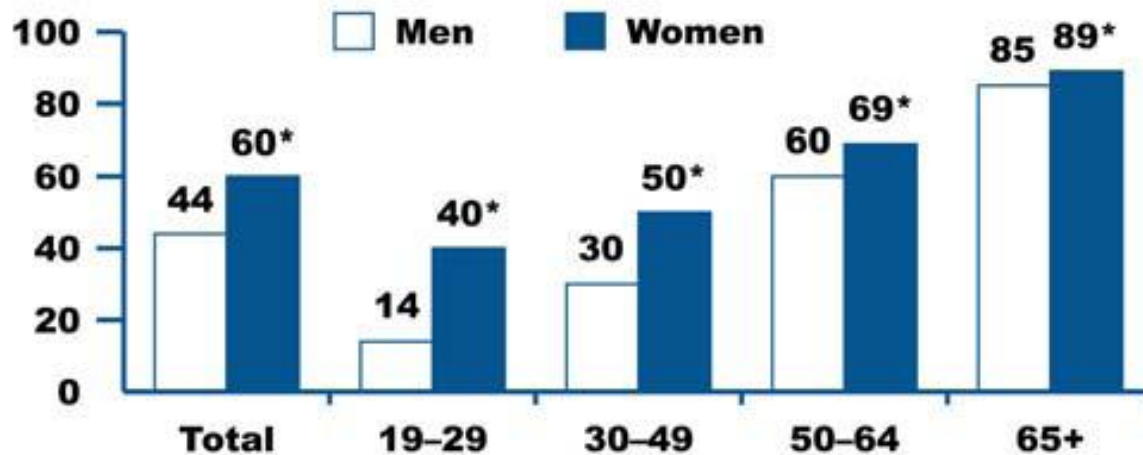
Percent of adults ages 19–64 by insurance source



Source: Analysis of the March 2005 Current Population Survey by S. Glied and B. Mahato for The Commonwealth Fund.

### Figure 4. Women Under Age 65 Are More Likely Than Men to Take Prescription Medicines on a Regular Basis

Percent of adults who take prescription medicines  
on a regular basis



\* Difference between men and women is significant at  $p \leq 0.05$  or better.

Source: The Commonwealth Fund Biennial Health Insurance Survey (2005).

# Gender and Health Care Access

Consumer Issue	Gender Majority
Consumers of Health Care	Women
Part-time employment	Women
Preventative Services	Women
Lower Income	Women
Higher out-of-pocket expenses	Women
Coverage through spouse	Women



# Connection to the System

- In general, women
  - “are more likely to have a usual primary care provider than men” (Agency for Healthcare Research and Quality, 2004)
  - “are more likely to enter treatment through primary care [as opposed to emergency services]” (Hauenstein et al., 2006)
  - with a connection to the health care system are more likely to have their mental health needs met” (Sherbourne et al., 2001)
  - may have fragmented care
- In general, men
  - use less medical services
  - have less frequent preventative ambulatory visits
  - tend to wait until there is an emergent need

# Measurable Outcomes

HEDIS: The nation's most widely used tool of health care quality measurement, developed and maintained by NCQA

## Gender Difference

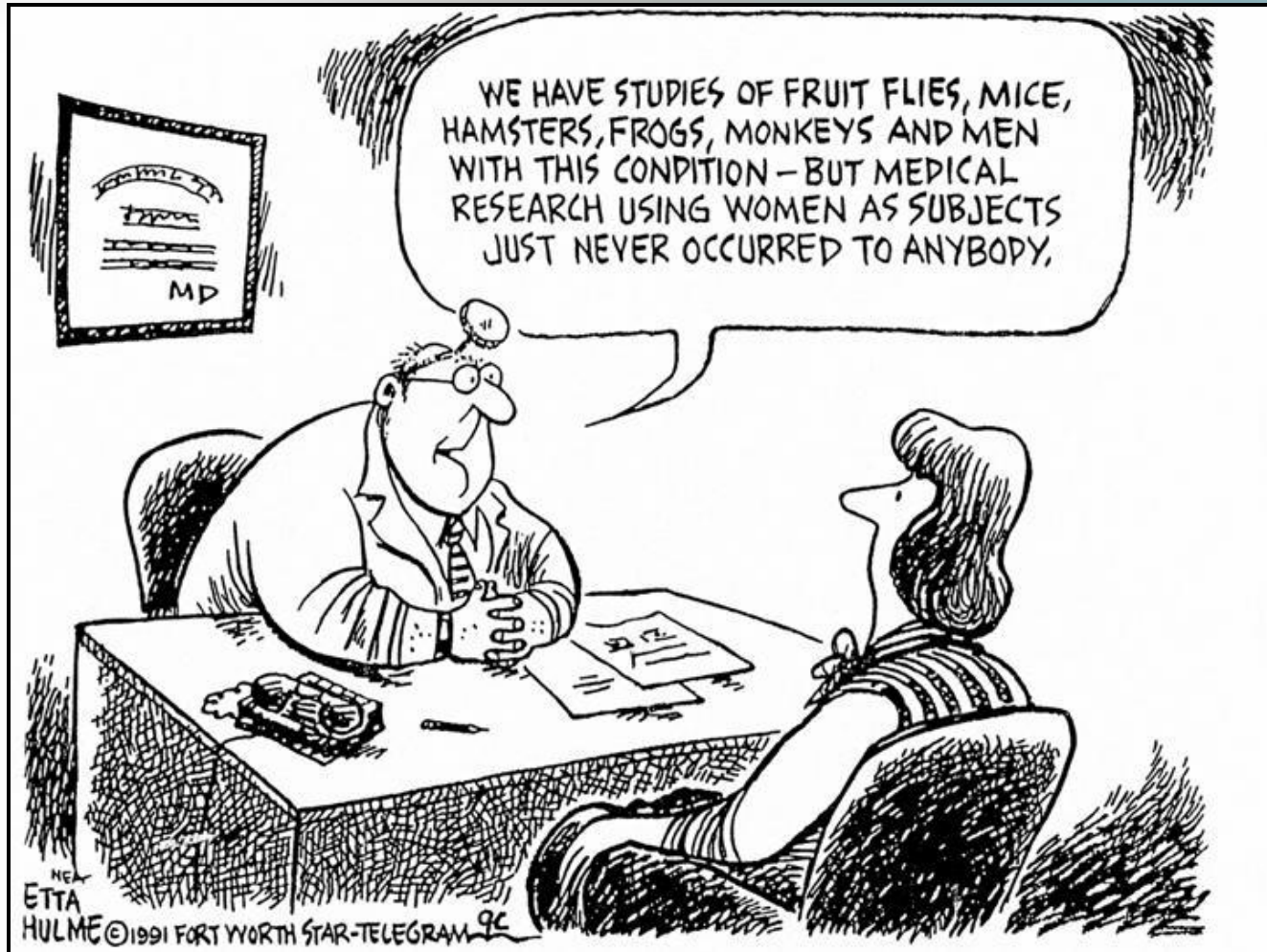
- Cholesterol

## No Gender Difference

- Blood Pressure
- HgA1C

Research

# Clinical Research in Women



# Formation of “Women’s Health”

- 1980-1990’s
  - Public Health Services Task Force on Women’s Health
  - Creation of the Office of Research on Women’s Health
  - FDA reversed its 1977 edict excluding women from clinical trials
  - National Institutes of Health Revitalisation Act 1993
    - 1998 65% of NIH studies included women

# Institute of Medicine Report: “Does Sex Matter” (2001)

- Scientists had made the assumption without confirmatory testing and that what is learned from studying men could be extrapolated to women without modification.
- At the time researchers did not report gender analysis, perform gender sub-analysis, or power studies to assess the impact of gender
- 2/3 of all research on diseases that affected both sexes had been performed exclusively in men

# Cardiovascular Disease

## AHA Guidelines

### Evidence-Based Guidelines for Cardiovascular Disease Prevention in Women

#### Expert Panel/Writing Group\*

Lori Mosca, MD, PhD (Chair)<sup>†</sup>; Lawrence J. Appel, MD<sup>†</sup>; Emelia J. Benjamin, MD<sup>†</sup>;  
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Debra R. Judelson, MD<sup>#</sup>; Nora L. Keenan, PhD<sup>††</sup>; Patrick McBride, MD, MPH<sup>†</sup>;  
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Sidney C. Smith, Jr, MD<sup>¶¶</sup>; George Sopko, MD, MPH<sup>|||</sup>; Anne L. Taylor, MD<sup>\*\*</sup>;  
Brian W. Walsh, MD<sup>||</sup>; Nanette K. Wenger, MD<sup>†</sup>; Christine L. Williams, MD, MPH<sup>†</sup>



# Hypertension

**31 studies** (103,268 men and 87,349 women)

## Major Drug Classes Included

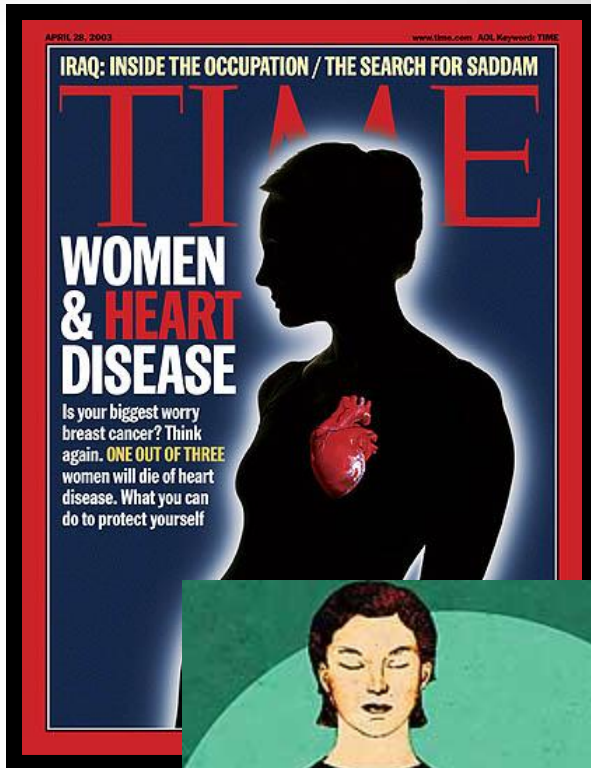
- ACE Inhibitors
- Angiotensin-receptor Blockers
- B-Blockers
- Calcium Channel Blockers
- Diuretics

## Major Outcomes

- Non-fatal stroke or death from cerebrovascular disease
- Non-fatal myocardial infarction or deaths from CHD
- Heart failure causing death or requiring hospitalization
- Total major cardiovascular events
- Total cardiovascular deaths
- Total mortality

Achieved blood pressure reductions were comparable for both men and women.

# Lipids

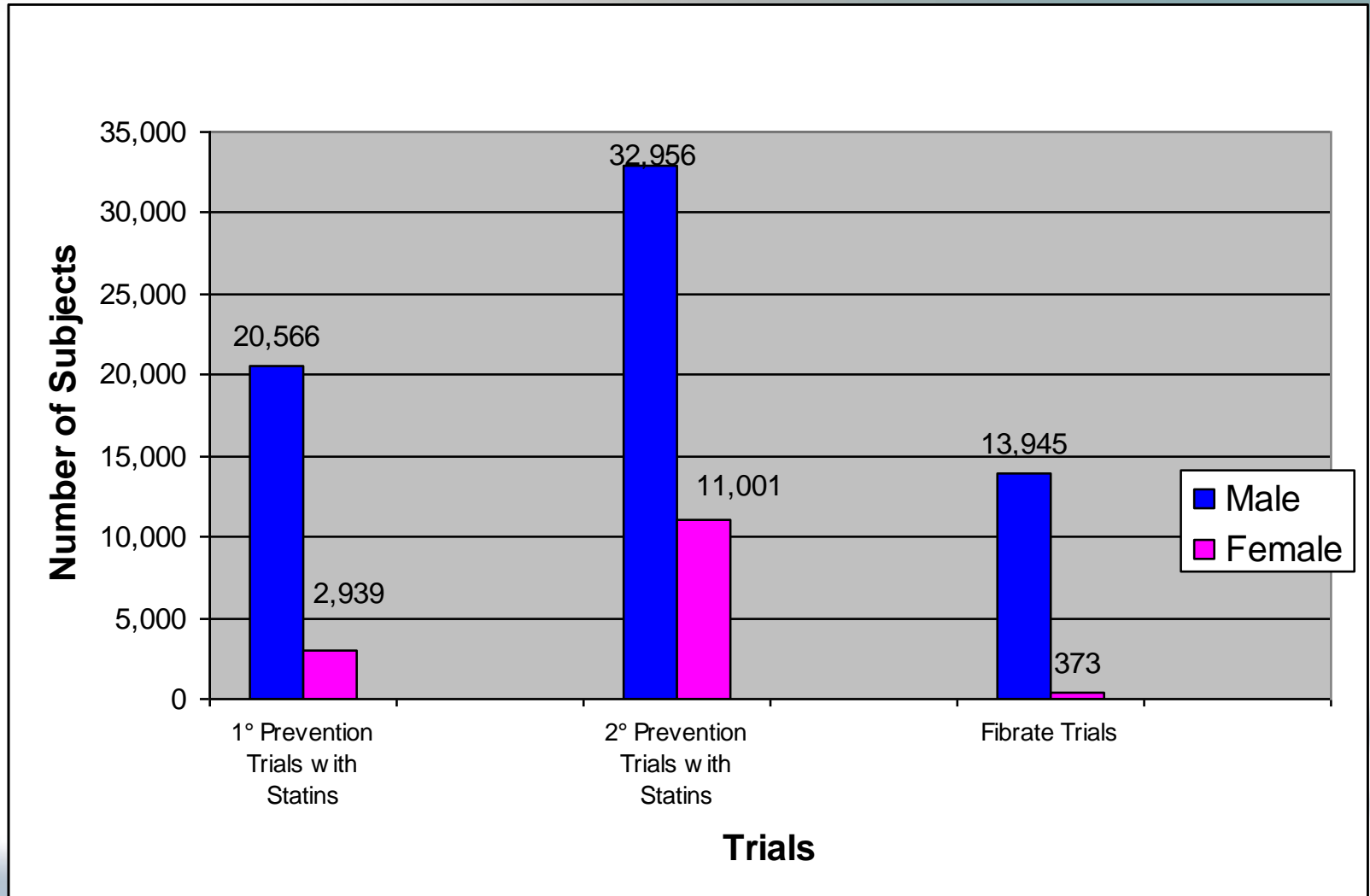


## Do Statins Work Equally Well for Men and Women?

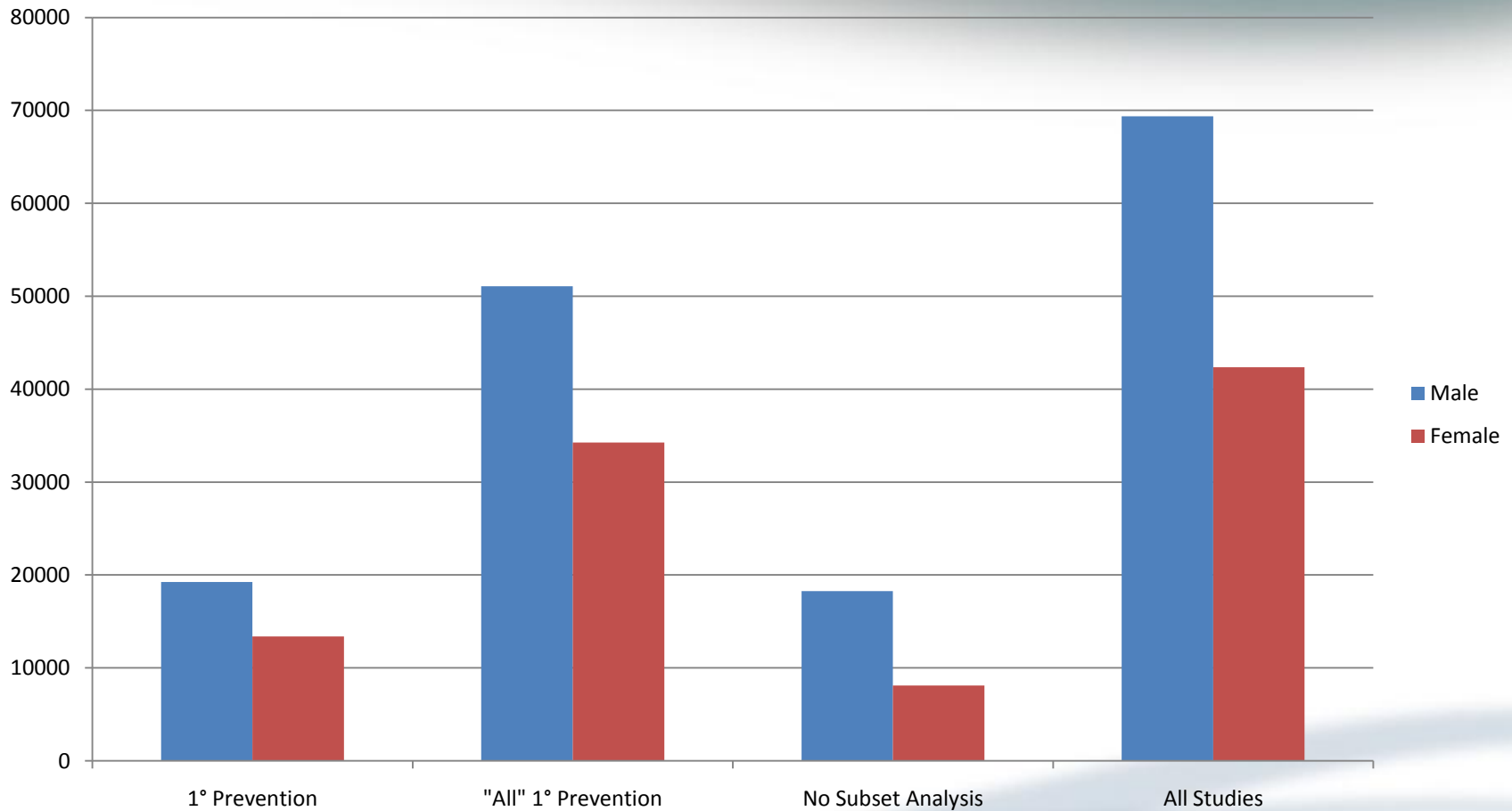
*Time Magazine March 31, 2010*



# Representation of ♀ in Clinical Trials of Cholesterol Lowering Medicines



# Representation of ♀ in Clinical Trials of Cholesterol Lowering Medicines



JUPITOR, MEGA, AFCAPS/TeXCAPS: Primary Prevention

ASCOT-LLA, ALLHAT-LLA: < 15% with CVD

HPS, PROSPER: No Gender Subset Analysis

# Justification of the Use of Statins

## (JUPITER)

- Study Design
  - Randomized placebo controlled trial
  - 20mg rosuvastatin
  - 11,00
  - Men > 50 yo Women > 60 yo
  - CRP < 2.0 ng/l LDL < 130 mg/dl
- The rates of the primary end point were 0.77 and 1.36 per 100 person-years of follow-up in the rosuvastatin and placebo groups
- The rosuvastatin group did have a higher incidence of physician-reported diabetes.
- NNT 120 for 1.9 years to prevent 1 event

# Justification of the Use of Statins

## (JUPITER)

Outcome Event	Men p-value	Women p-value
Primary Event	<0.0001	0.02
Non-fatal MI	<0.0001	0.18
Any MI	0.0006	0.11
Any Stroke	0.0005	0.40
Arterial revascularization and hospitalization	0.002	<0.0001
MI, Stroke, Death from CVD	<0.0001	0.16
Any Death	0.08	0.12
New Onset DM	0.29	0.008

# Carotid Atorvastatin Study in Hyperlipidemic Postmenopausal Women (CASHMERE)

- 12 month trial
- Postmenopausal Women
- Moderate Dyslipidemia
- Randomized Placebo Controlled
- 80mg Atorvastatin vs. Placebo (n=192 vs 206)
- Results: No change in intimal medial thickness (IMT)



# Primary Prevention with Statins in Women

The risk benefit ratio of statins for primary prevention of CVD in women has not been definitively established.

The differing results in men compared to women may be due to the diminished effect of elevated LDL in women compared to men or the lack of evaluation of more unique risk factors

# The Aspirin Connection



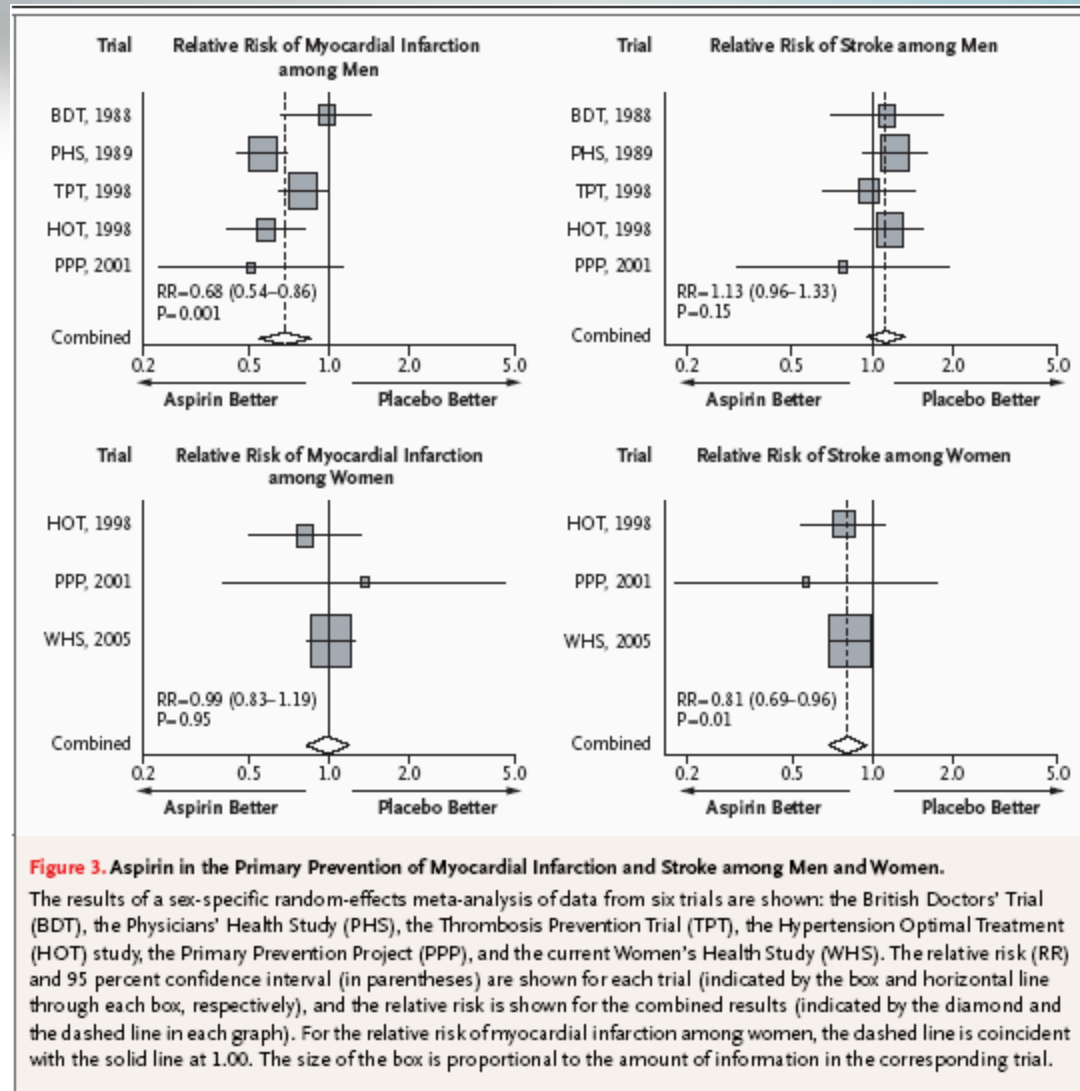
# Women's Health Study Aspirin

New England Journal

March 2005

- 40,000 Women
- Aspirin 100 mg every other day vs placebo
- Followed for 10 years
- Results
  - Non-fatal Stroke
  - Non-fatal Heart Attack
  - Hemorrhagic Stroke
  - Cardiovascular disease death

# Aspirin Results in Men vs Women



## Relative risks and 95% confidence intervals of myocardial infarction stratified by percentage of male participants

Male (%)	Non-fatal MI	p*	Fatal MI	p*	Both fatal and non-fatal MI	p*
0–66	0.87 (0.71–1.06)	0.26	0.87 (0.65–1.17)	0.86	0.86 (0.79–0.95)	0.52
70–89	0.72 (0.61–0.86)	0.23	0.91 (0.75–1.11)	0.24	0.82 (0.71–0.95)	0.13
100	0.62 (0.54–0.71)	0.48	0.55 (0.20–1.53)	0.01	0.63 (0.46–0.85)	0.02
Total	0.72 (0.64–0.81)	0.03	0.88 (0.75–1.03)	0.19	0.79 (0.72–0.87)	< 0.05

MI, myocardial infarction.

\*Test for heterogeneity, p value is from  $\chi^2$  test. Ransom effects model was used in all combinations.

Yerman *et al.* *BMC Medicine* 2007

total of 23 trials (n = 113,494 participants)

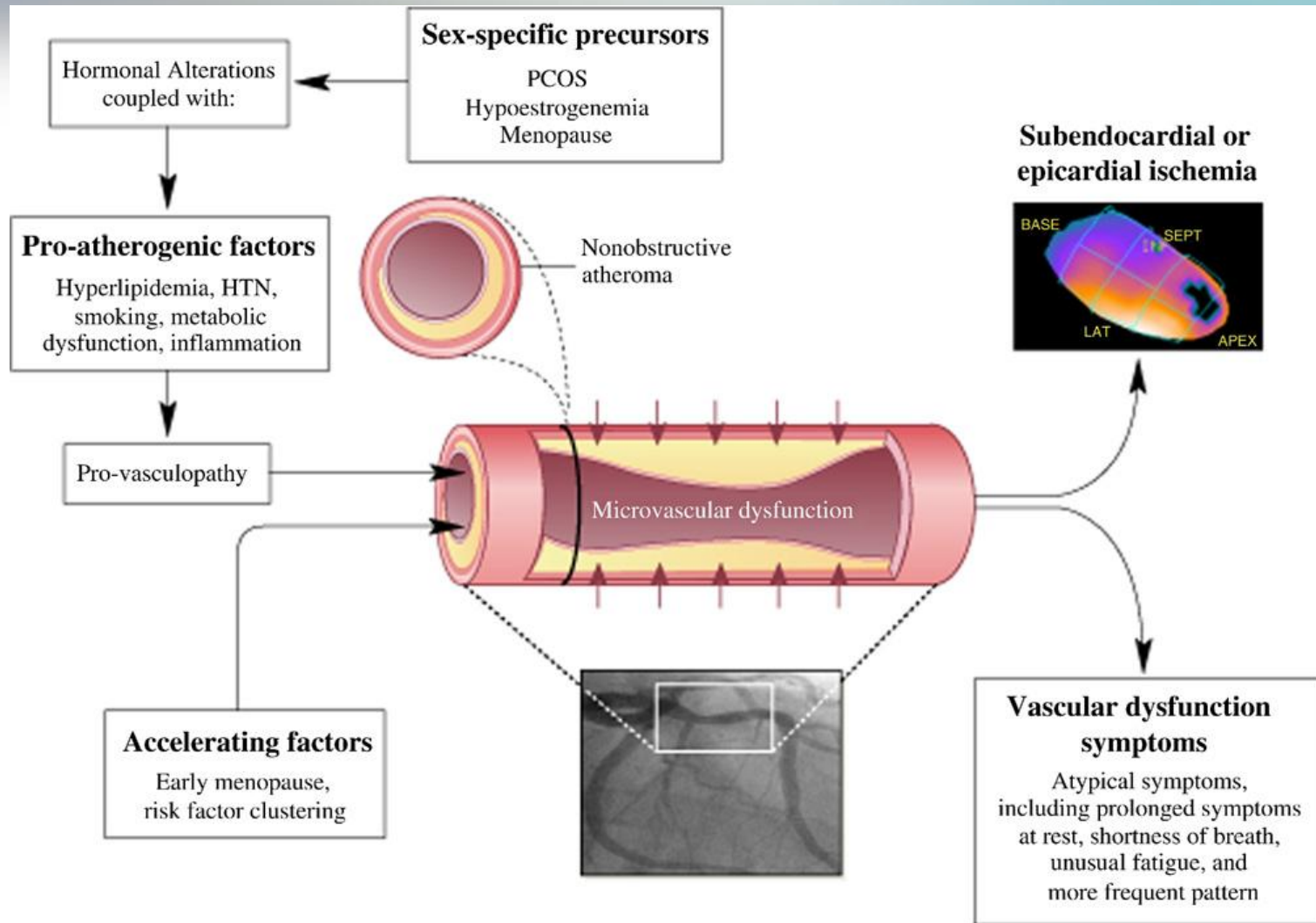
# Gender and Aspirin

- Men
  - Decrease Risk of MI
  - No/Slight Decrease Risk of Stroke
  - Recommendations
    - Men with known CAD
    - Men with a  $\geq 10\%$  10 yr risk
    - Men  $> 45$  yo when benefit  $>$  risk
- Women
  - ? decrease of MI
  - Decrease in Risk of Stroke
  - Recommendations
    - Women with known CAD
    - Women with a  $\geq 10\%$  10 yr risk
    - Women  $> 55$  yo if benefit  $>$  risk

# Cardiovascular Disease

- Women arrive at the hospital later than men
- Younger women were less likely to be treated with aspirin
- Women were more likely to be given a diagnosis other than coronary artery disease
- Less women discharged on beta-blockers
- Women have a slightly higher 30 day mortality
- Women had longer door-to-needle time (12.5 min)

# Model of Microvascular Angina in Women





# Mental Health

# Antidepressants

- Prescribing rate for antidepressants increased by 48% between 1995-2002
- 118 million prescriptions (CDC, 2005)
- Most commonly prescribed medication (CDC, 2005)

# Gender and Depression

Parameter	Women as compared to Men
Age at onset	Earlier
Lifetime Prevalence Rate	Higher (20% vs. 10%)
Duration of episodes	Longer
Relapse Rate	Higher
Effect of Seasonal Changes	Greater
Response to SSRI	Women
Co-morbid anxiety	Greater
Co-morbid Alcohol and Substance Abuse	Less
Association of Gonadal Hormones	Greater
Suicide Attempts	Greater
Suicide Completion	Less

# Nicotine Addiction

# Effect of Nicotine on Women

- Nicotine
  - Women: calming effects on stress-induced mood changes
  - Men: enhance aggressive moods
- Nicotine + alcohol
  - Women: appears to enhance the effects of alcohol.
  - Men: appears to dilute some of the sedating and intoxicating effects of alcohol.
- Women may be more responsive than men to non-nicotine stimuli

# Smoking Cessation

- Quitting Smoking
  - Women less successful than men
  - Women relapse more often and for different reasons than men
- Women > Men
  - Join smoking cessation groups
  - Experience severe withdrawal symptoms
  - Worry about weight gain
- Men > Women
  - Benefit from nicotine replacement therapy
- Women = men
  - Effectiveness of bupropion

# Gender and Diabetes

- Women vs. Men with OSA
  - New-onset DM: OR 11.8
- Severe Diabetic Retinopathy
  - M > F
- Risk of sudden death in patients with adult-onset DM
  - 300% (F) vs 50% (M)
- Skin Disorders in DM
  - Lipodystrophy F>M
  - Acanthosis Nigricans F>M
- Baseline albuminuria
  - M>F

Celen YT et al, J Clin Sleep Med. 2010 Jun 15;6(3):244-50

Chatziralli IP et al, BMC Res Notes. 2010 Jun 1;3:153

Oseaghdha DM et al Am J Kidney Dis. 2010 Jul 2

# Gender-Specific Medicine

- Encompasses all Aspects of Medicine
- Proven Gender Differences
- Future Applications in Clinical Practice
- Improved Clinical Care
- Expand Research and Education Programs
- Benefits Both Men and Women



# Gender-Specific Health Disparities

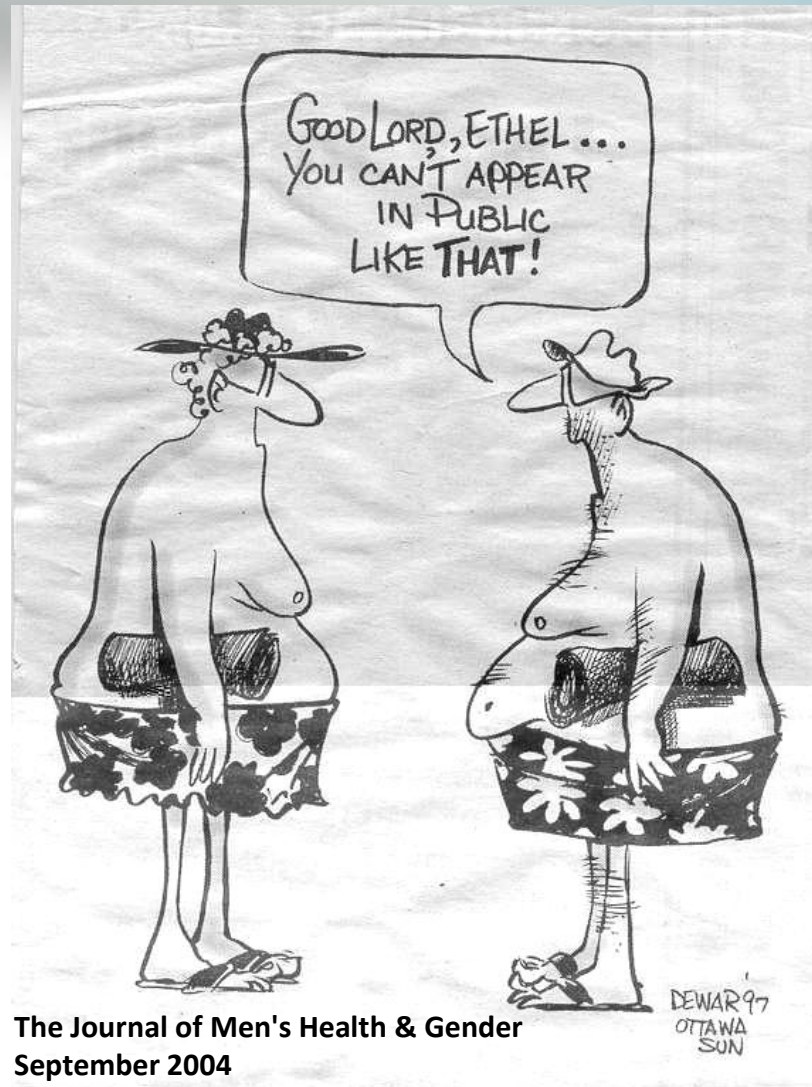
The study of sex- and gender-based differences in healthcare continues to be limited by

- a historical deficit in data on women
- an emerging understanding of unique issues about women's gender specific medicine
- the absence of standardized reporting mechanisms to collect and analyze data

# Challenges

- To determine where and when sex- and gender-based differences in health emerge
- To determine the clinical significance of observed differences

# Gender Disparities Exist



Thank you for Your Attention