The life of a cardiologist Episode 1

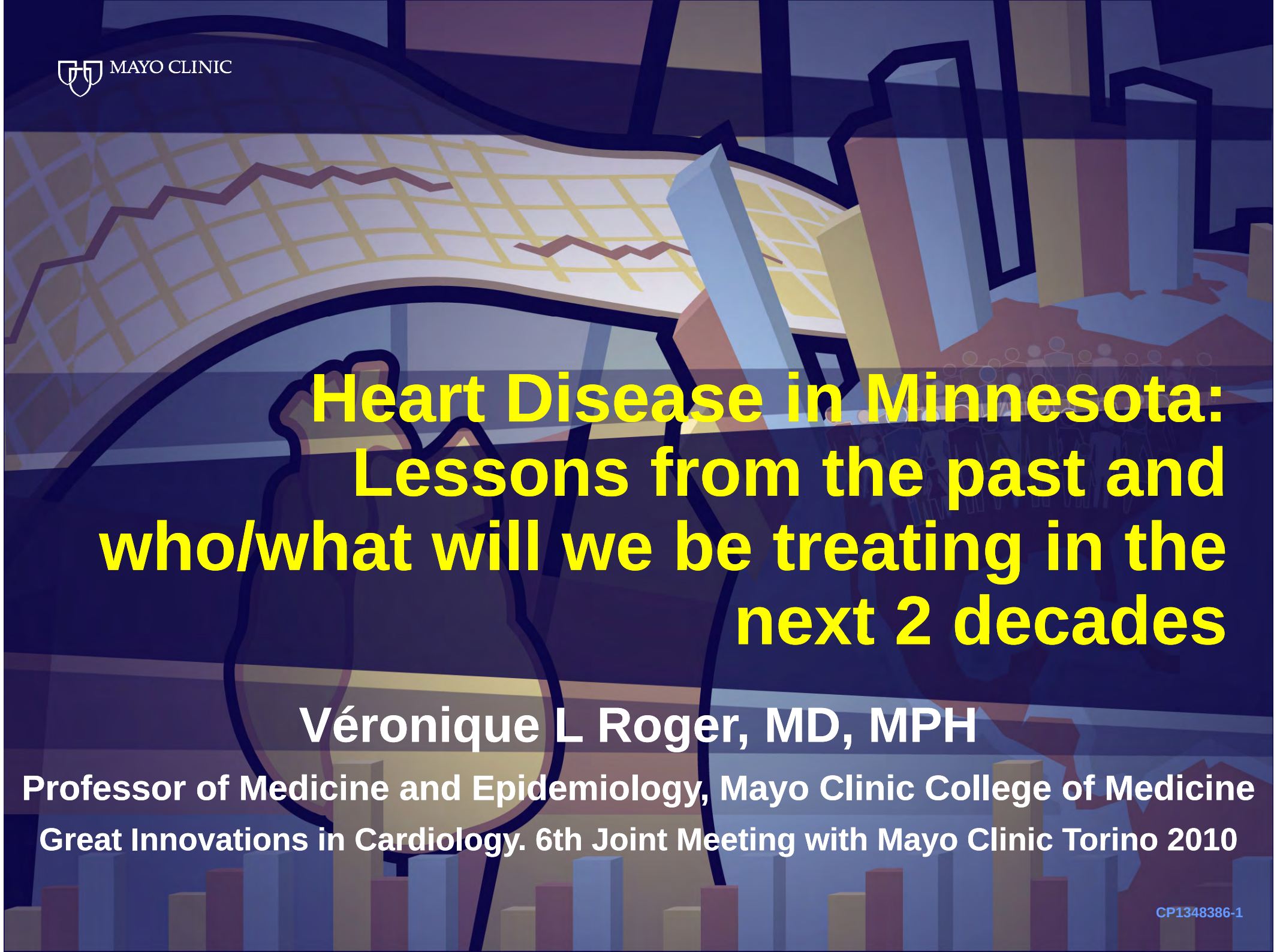
- 90 y/o retired dentist admitted for unstable angina
- Heparin, Beta Blockers, ASA, NTG
- Continuing angina at rest
- Discussion…..

The life of a cardiologist Episode 2

- Coronary angio: is there a culprit lesion?
- Angio: 80% Left main, 60 to 80% in all 3 branches…..Discussion…
- Surgical consultation: Offered CABG ~ 5 to 10% mortality……More discussion...

The life of a cardiologist Episode 3

- 4 Vessel CABG, discharged day 7 post-op
- I got postcard from patient's honeymoon in California 1 year later
- Died 3 years later after 4 episodes of HF, all but 1 as outpatient



MAYO CLINIC

Heart Disease in Minnesota: Lessons from the past and who/what will we be treating in the next 2 decades

Véronique L Roger, MD, MPH

Professor of Medicine and Epidemiology, Mayo Clinic College of Medicine

Great Innovations in Cardiology. 6th Joint Meeting with Mayo Clinic Torino 2010

CP1348386-1

MAYO CLINIC

Disclosures

National Heart Lung and Blood Institute

ROCHESTER EPIDEMIOLOGY PROJECT

IMPROVING COMMUNITY HEALTH THROUGH RESEARCH

www.RochesterProject.org

American Heart Association

Learn and Live.

RO1 HL 59205

RO1 HL 72435

K24 HL 68765

R01 AR 30582

American Heart Association

Established Investigator award

Objectives

- Measuring CVD trends
- Coronary disease
- From CHD to HF
- Integration and interpretation

roger.veronique@mayo.edu

Concretely---Integrated Approach to CVD

Goal

Reduce risk behaviors in a population	Reduce burden of risk factor in individuals	Treat overt CVD

Type of intervention

Socioeconomic political	↔	Prevention	↔	Clinical

Examples

• Taxing tobacco • Subsidizing healthy foods • Health Education • Promote physical activity	• Identify and treat high cholesterol or hypertension • Smoking cessation • Exercise program	• Lipid-lowering drugs • Antiplatelet agents • Beta blockers • ACE-inhibitors • Revascularization

MAYO CLINIC

Adapted from Yusuf: Circ, 2001

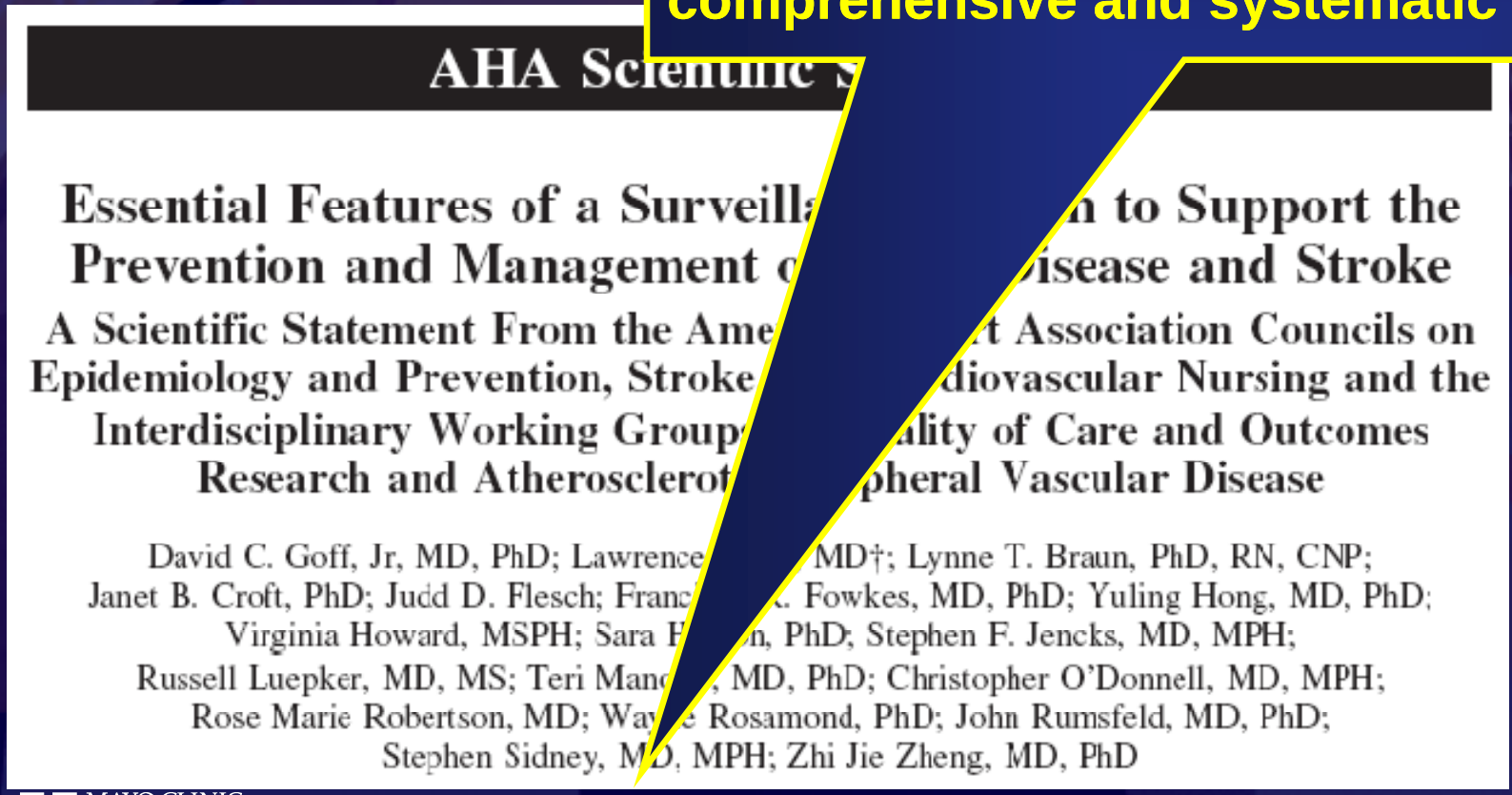
Measuring CVD trends
National Statistics and Surveys

- Mortality and morbidity reports
- Administrative data: CMS, hospital discharge surveys
- Voluntary registries (procedures, NRMI, CRUSADE)
- Surveys: EuroAspire, National Health and Nutrition Examination Survey

Not validated, at episode not person level, voluntary for some
Useful for hypothesis generating and policy making

CVD surveillance

"A strategic goal of the AHA is to reduce heart disease, stroke, and the risk for both by 25%,… However, the current health tracking systems (surveillance) in the United States cannot track progress toward these goals in a comprehensive and systematic manner"



AHA Scientific S

Essential Features of a Surveill n to Support the Prevention and Management o isease and Stroke

A Scientific Statement From the Ame t Association Councils on Epidemiology and Prevention, Stroke diovascular Nursing and the Interdisciplinary Working Group ality of Care and Outcomes Research and Atherosclerot pheral Vascular Disease

David C. Goff, Jr, MD, PhD; Lawrence MD†; Lynne T. Braun, PhD, RN, CNP; Janet B. Croft, PhD; Judd D. Flesch; Franc . Fowkes, MD, PhD; Yuling Hong, MD, PhD; Virginia Howard, MSPH; Sara H n, PhD; Stephen F. Jencks, MD, MPH; Russell Luepker, MD, MS; Teri Manc , MD, PhD; Christopher O'Donnell, MD, MPH; Rose Marie Robertson, MD; Wa e Rosamond, PhD; John Rumsfeld, MD, PhD; Stephen Sidney, M D, MPH; Zhi Jie Zheng, MD, PhD

MAYO CLINIC

Circulation, 2007 115:127-55

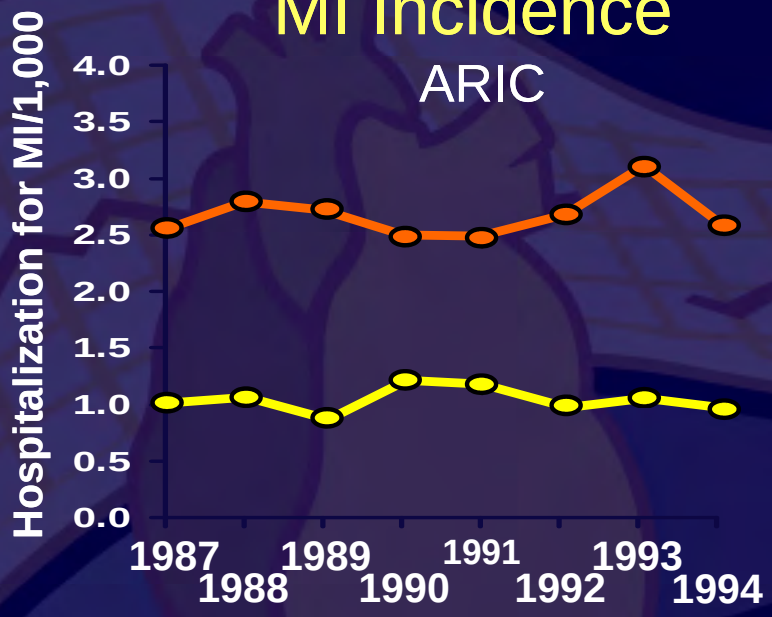
Community surveillance

Systematic approach to measure validated CVD mortality, Dx incidence, and post-Dx survival to provide insight into the determinants of the trends

- **Defined** population
- **Rigorous** event definition
- **Constant** criteria across time, place, person

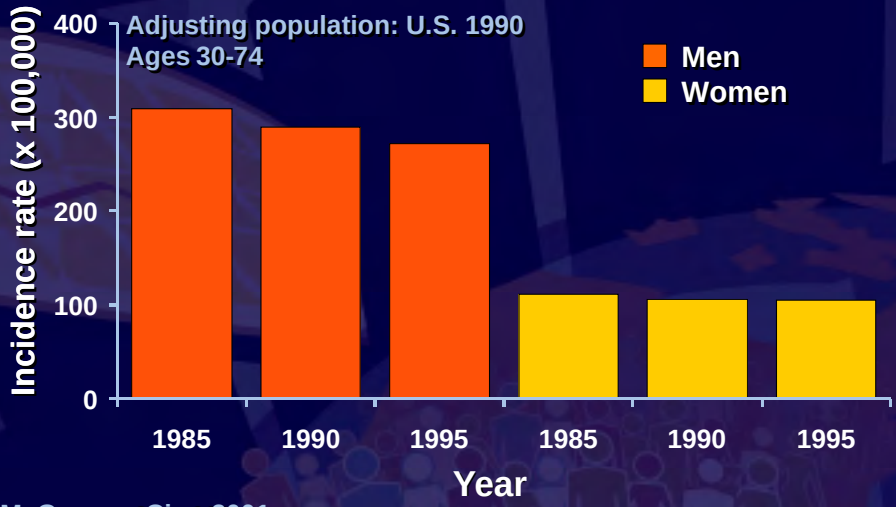
ARIC, Minnesota Heart Survey, Olmsted County Study Worcester Heart Attack Study, MONICA, others…

MI Incidence
ARIC



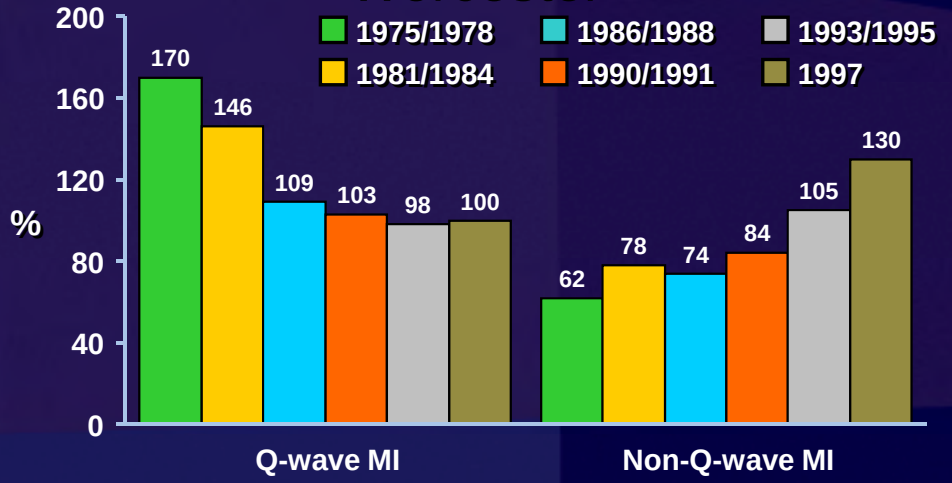
Rosamond, NEJM 1998

Acute CHD
MN Heart Survey



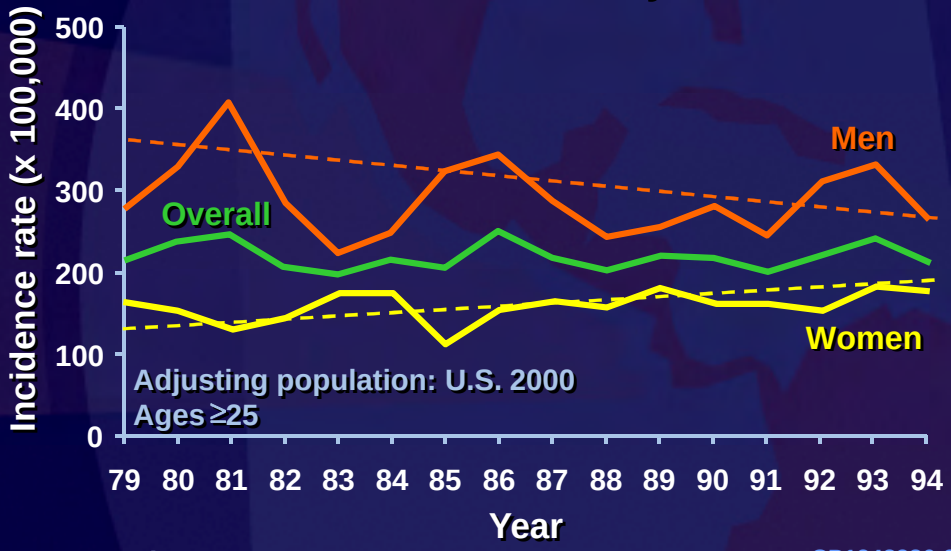
McGovern: Circ, 2001

MI Incidence
Worcester



Furman et al: JACC, 2001

MI Incidence
Olmsted County



Ann Int Med, 2002

MAYO CLINIC

CP1348386-9

The incidence of MI among British men

- British Regional Heart Study
- 7735 men ages 40-59
- Recruited 1978-1980; follow-up until 2004
- MI incidence declined 3.8%/year i.e. 62% over 25 years

Hardoon et al, Circ 2008

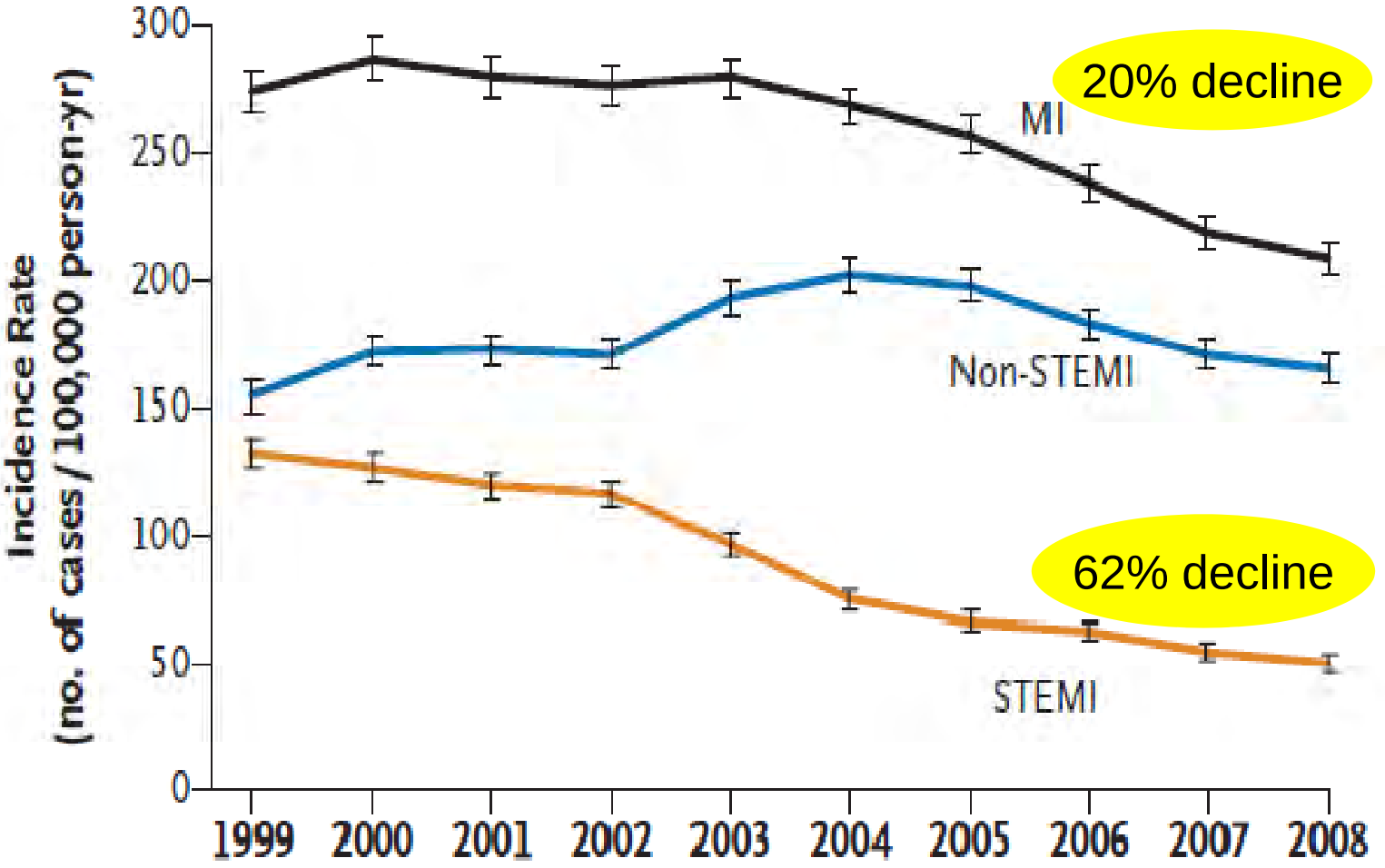
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JUNE 10, 2010 VOL. 362 NO. 23

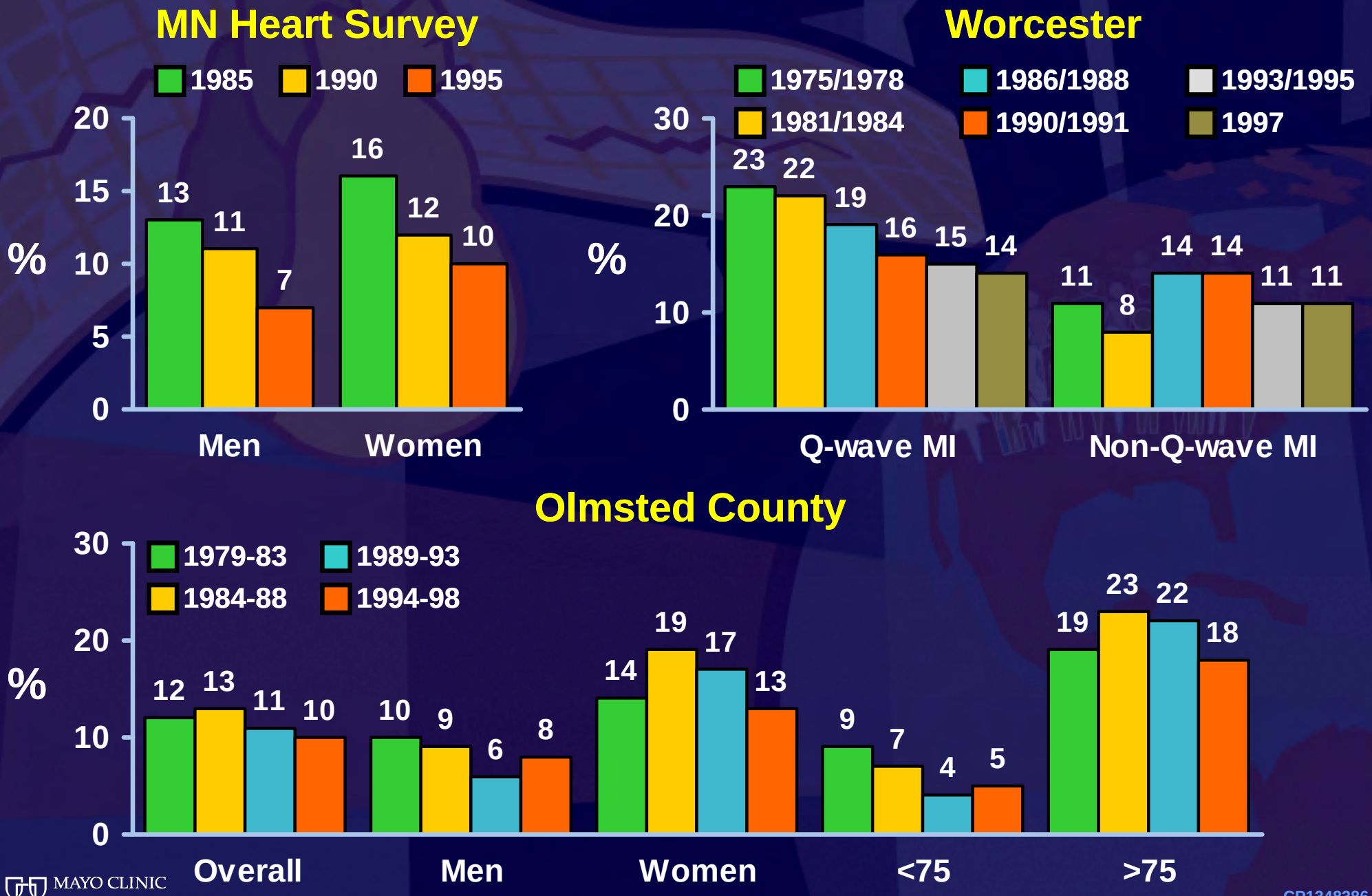
Population Trends in the Incidence and Outcomes of Acute Myocardial Infarction

Robert W. Yeh, M.D., Stephen Sidney
Joseph V. Sel

Kaiser Permanente



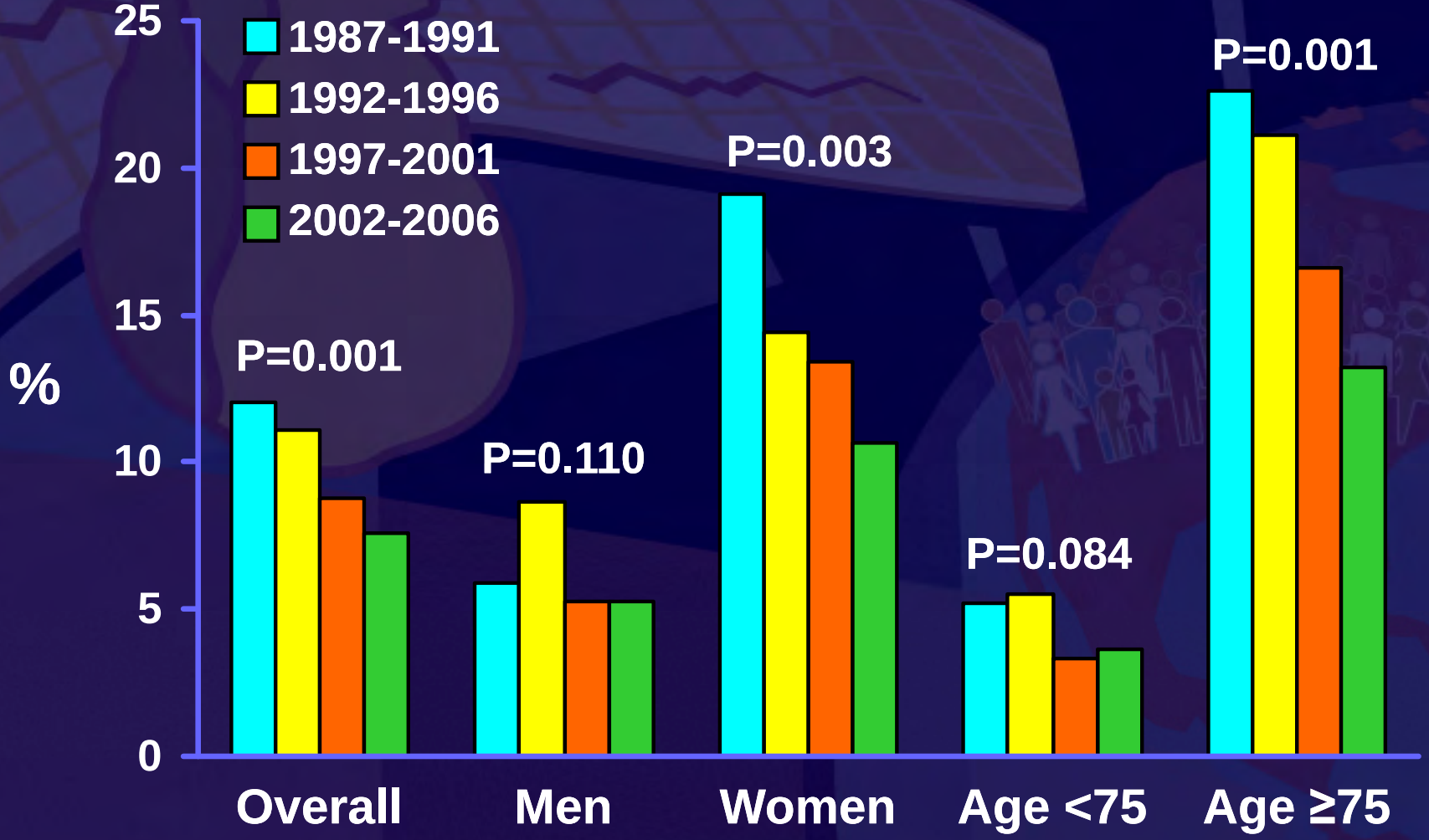
Case Fatality Rates



MAYO CLINIC

CP1348386-8

Death at 30 days post MI
Olmsted County



MAYO CLINIC

Circulation 2010

Question from Dr Marra

- What about all CHD?
- Is the incidence of all CHD declining?

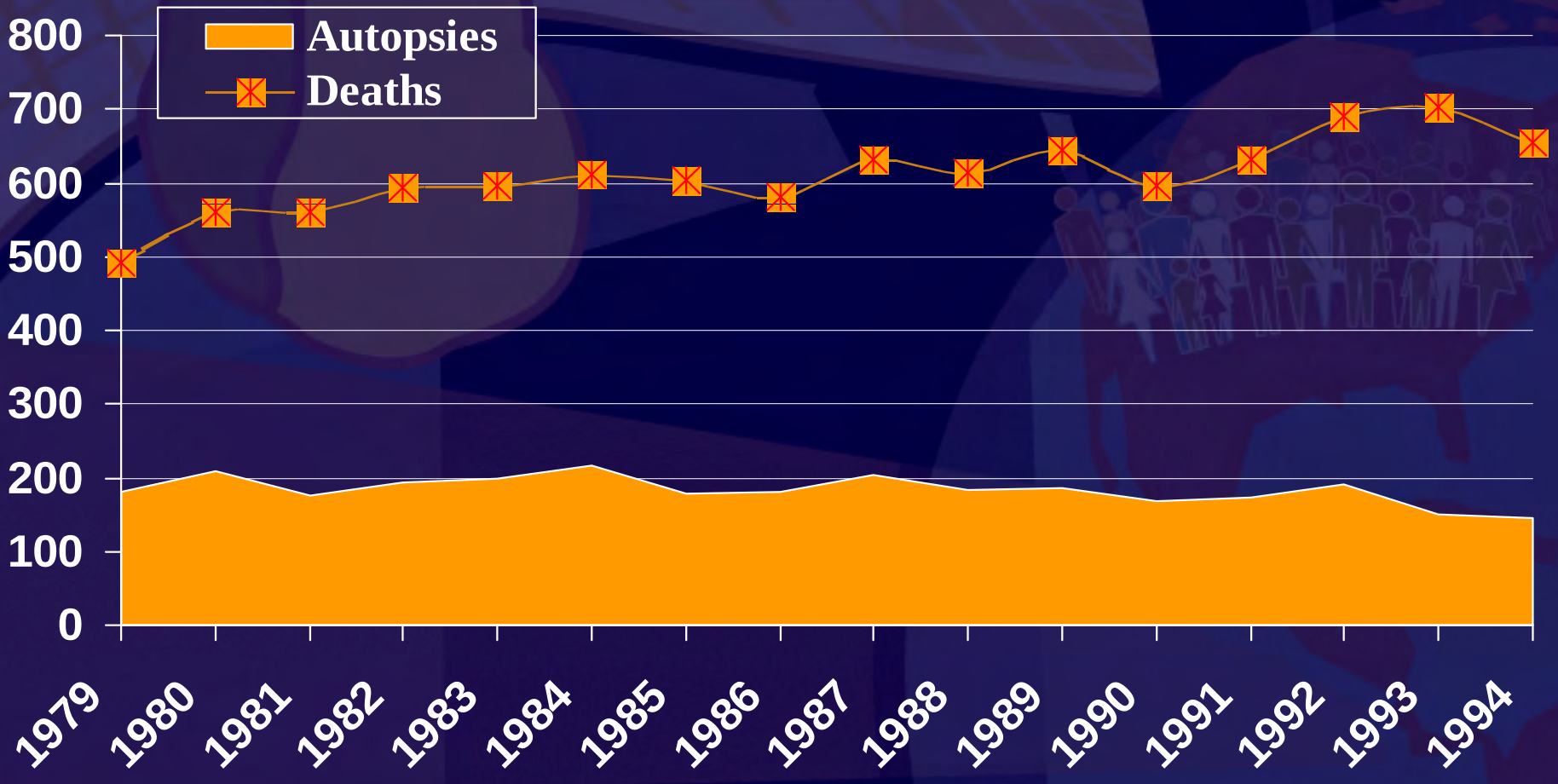
All coronary disease is more complicated…

Manifestations of coronary disease

- Myocardial infarction
- Sudden death
- Angina pectoris
- Anatomic coronary disease (angio or autopsy)

Autopsy trends

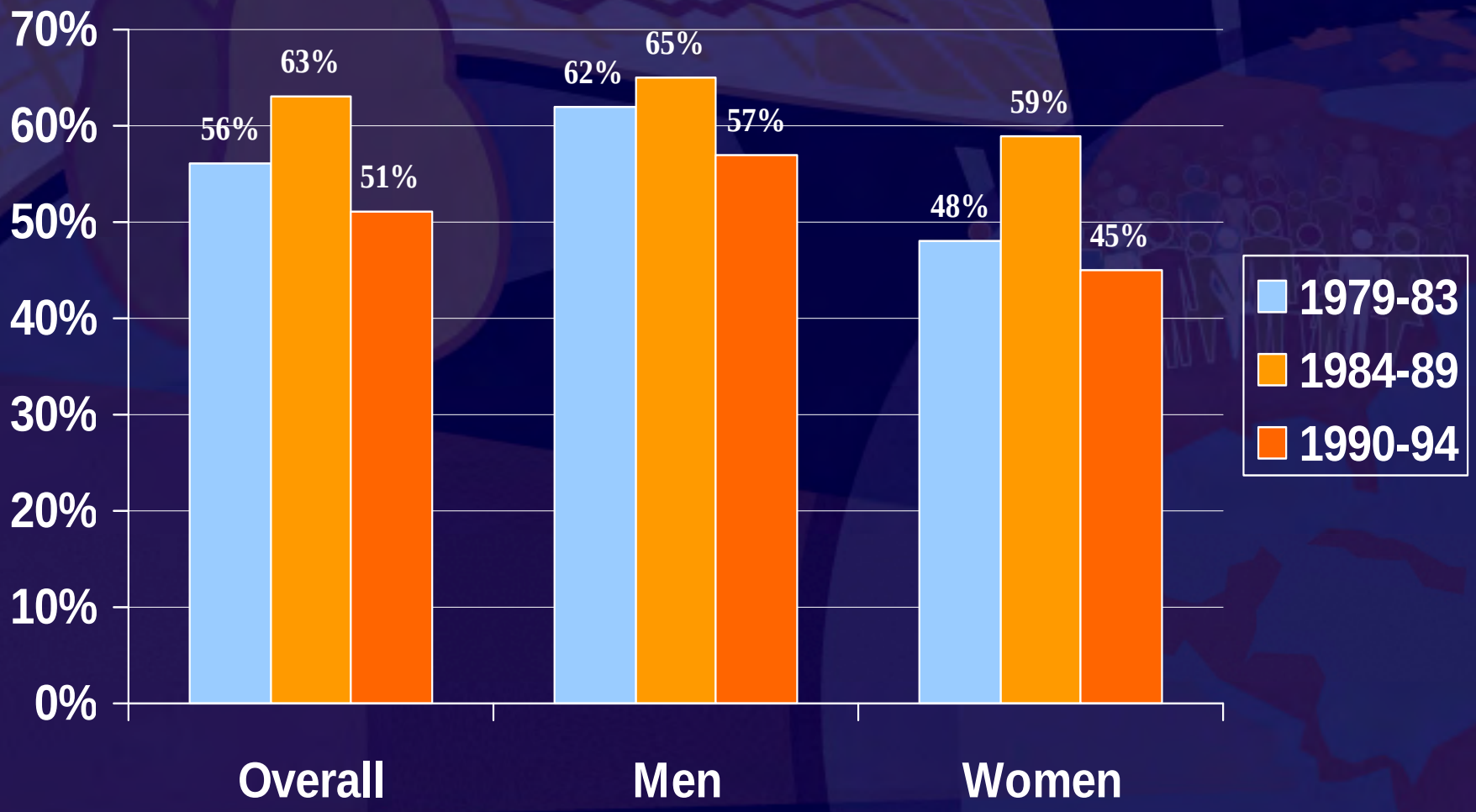
Olmsted County



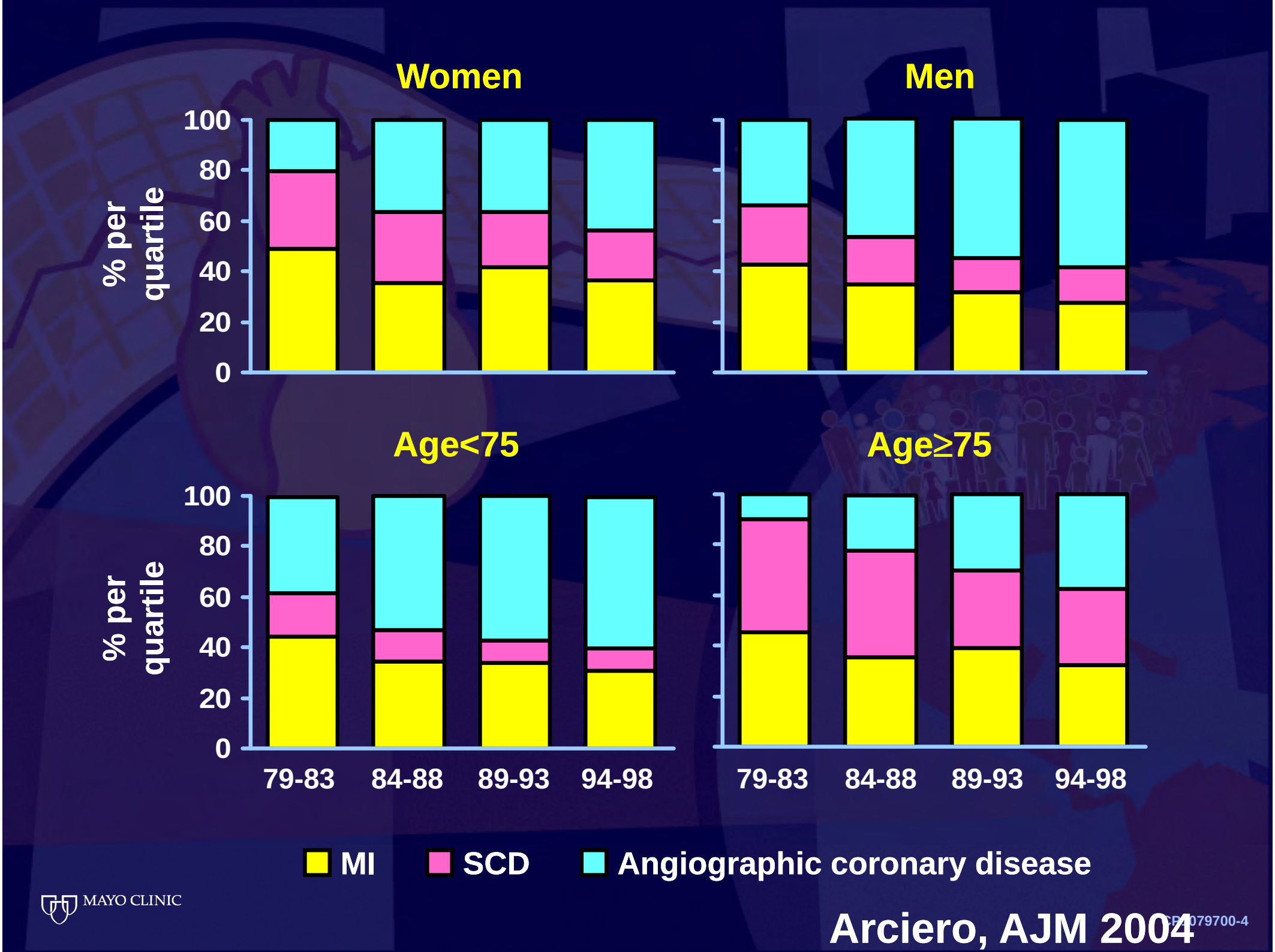
Average autopsy rate: 30%

MAYO CLINIC

Prevalence of CAD at autopsy



Am J Med 2001

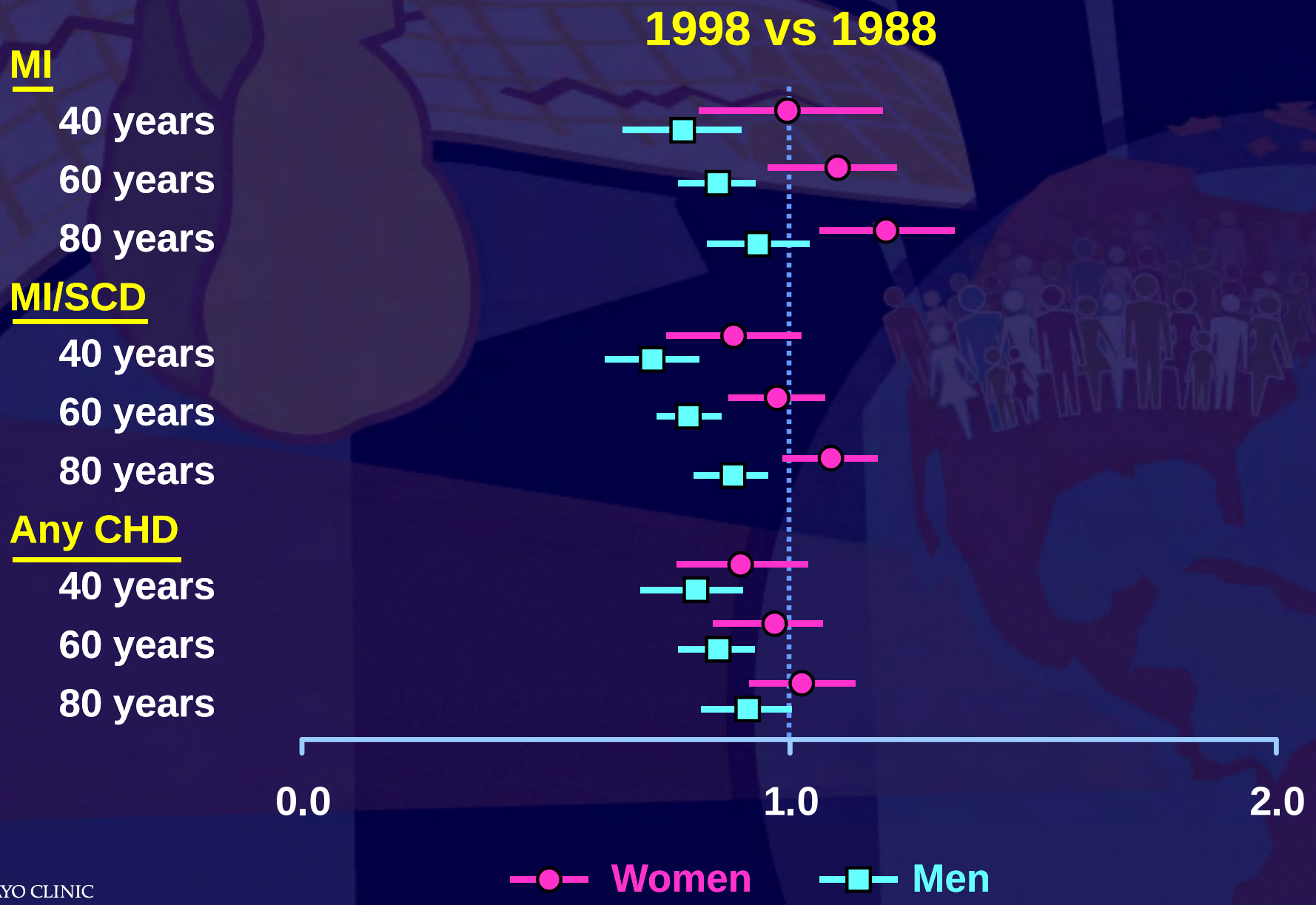


MAYO CLINIC

Arciero, AJM 2004

CB079700-4

Age- and Sex-Specific Relative Risks for Incident CHD



Arciero, AJM 2004

Coronary disease trends

Incidence ↓ → **Primary prevention**

Fatalities ↓ → **Medical care**

The decline in CHD deaths is multi-factorial

2007

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

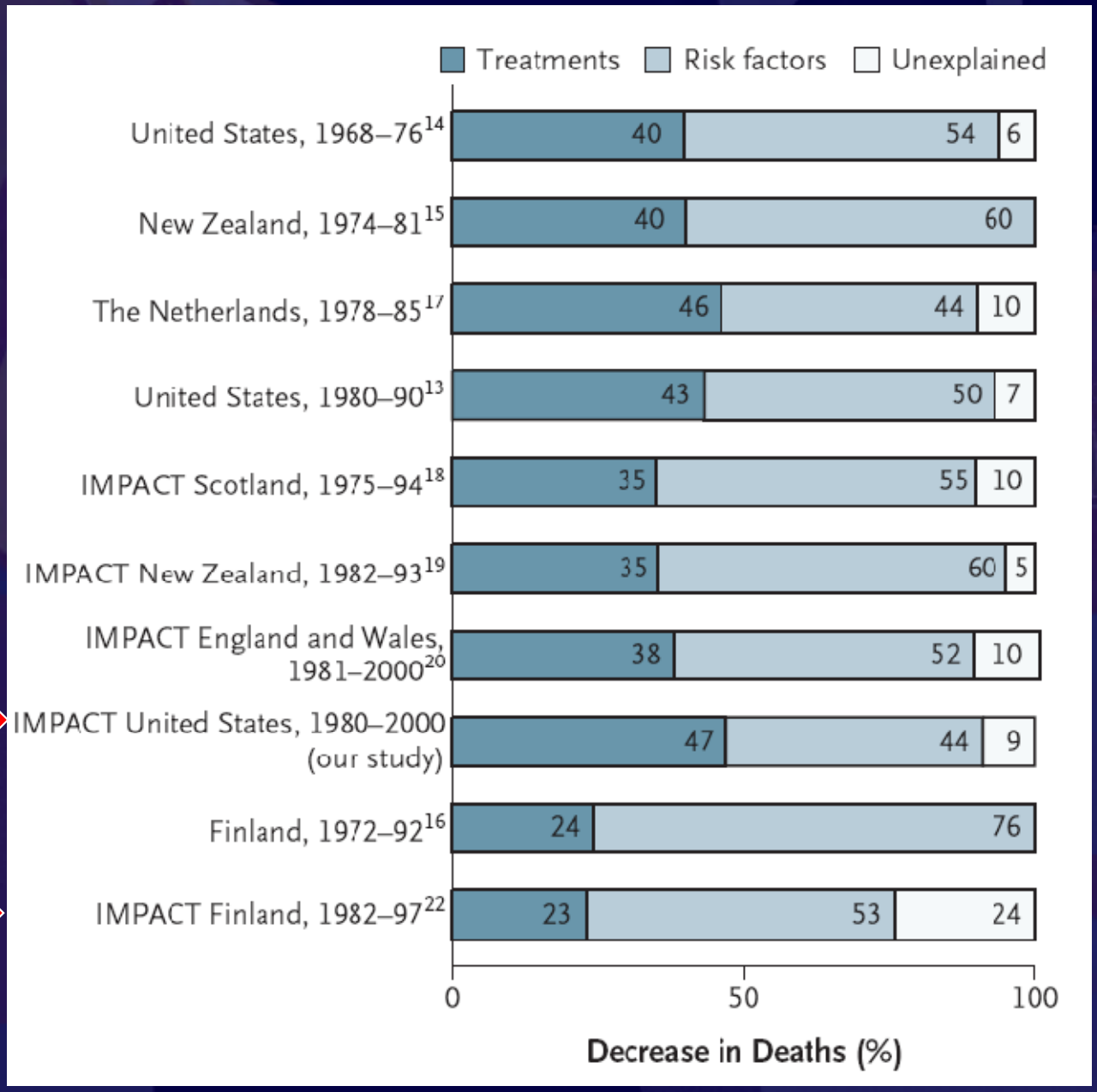
Explaining the Decrease in U.S. Deaths from Coronary Disease, 1980–2000

Earl S. Ford, M.D., M.P.H., Umed A. Ajani, M.B., B.S., M.P.H., Janet B. Croft, Ph.D., Julia A. Critchley, D.Phil., M.Sc., Darwin R. Labarthe, M.D., M.P.H., Ph.D., Thomas E. Kottke, M.D., Wayne H. Giles, M.D., M.S., and Simon Capewell, M.D.

CONCLUSIONS

Approximately half the decline in U.S. deaths from coronary heart disease from 1980 through 2000 may be attributable to reductions in major risk factors and approximately half to evidence-based medical therapies.

Determinants of CHD mortality decline



Ford et al, NEJM 2007


From CHD to HF

The New England Journal of Medicine

Special Article

SHATTUCK LECTURE — CARDIOVASCULAR MEDICINE AT THE TURN OF THE MILLENNIUM: TRIUMPHS, CONCERNS, AND OPPORTUNITIES

EUGENE BRAUNWALD, M.D.

"Two new epidemics of cardiovascular disease are emerging: **Heart failure** and atrial fibrillation."

"The prime candidates for the development of HF are patients with hypertension and **survivors of acute MI** who have been spared death from arrhythmia."

AT the end of every century it is customary to reflect on the events of the past hundred years and to look toward the future, and in this lecture I should like to do this for cardiovascular disease. This is also an especially opportune time to comment on progress in cardiovascular disease, because both the National Heart, Lung, and Blood Institute and the American Heart Association are celebrating their golden anniversaries within the next 18 months. These two organizations have had the most profound influence on the development of research on cardiovascular disease during the 20th century.

A bewildering amount of information and statistics regarding cardiovascular disease is available in the medical literature and the public media. As a result, information about cardiovascular disease has become quite familiar both to health care professionals and to the public. It is timely to bring some perspective to this information, to identify the major trends that have occurred and to discern future directions. To this end, it may be useful to consider knowledge about cardiovascular disease in the 20th century as having developed in four phases. Although these four phases overlap temporally, they are distinct conceptually.

PHASE 1: THE PANDEMIC OF CARDIOVASCULAR DISEASE EMERGES

As the 20th century began, heart disease was the fourth most common cause of death in the United States, after pneumonia, tuberculosis, and diarrheal disease, but it was already much more common than cancer (Fig. 1).[1] By 1910 heart disease had achieved first place, and except for a brief period after the great influenza epidemic, it has remained the most common cause of death in the United States. During the first half of this century, the percentage of

deaths due to cardiovascula
stantially in all age groups,
races. Indeed, by mid-centu
accounted for more than ha
in the United States (Fig. 2
der of the industrialized wo
tion between streptococcal
heart disease was clear, as
aorta by *Treponema palli*
development of luetic hea
major causes of death and
cular disease — sudden death and acute myocardial infarction — were still mysterious. Often these appeared unexpectedly like bolts out of the blue, striking persons in their most productive years who had previously been well.

PHASE 2: THE BATTLE IS JOINED

After World War II the industrialized nations turned their attention to domestic problems, including health, and recognized the enormous toll taken by cardiovascular disease. Therefore, the second phase of cardiovascular medicine in the 20th century be-

tute immediately began ... support both basic and applied research. Among its most far-reaching early actions was the reorganization of the Framingham Heart Study in 1949, thereby creating one of the first major efforts dedicated

From Partners Health Care System and the Department of Medicine, Harvard Medical School and Brigham and Women's Hospital, Boston. Address reprint requests to Dr. Braunwald at Prudential Tower, Suite 1150, 800 Boylston St., Boston, MA 02199-8001.

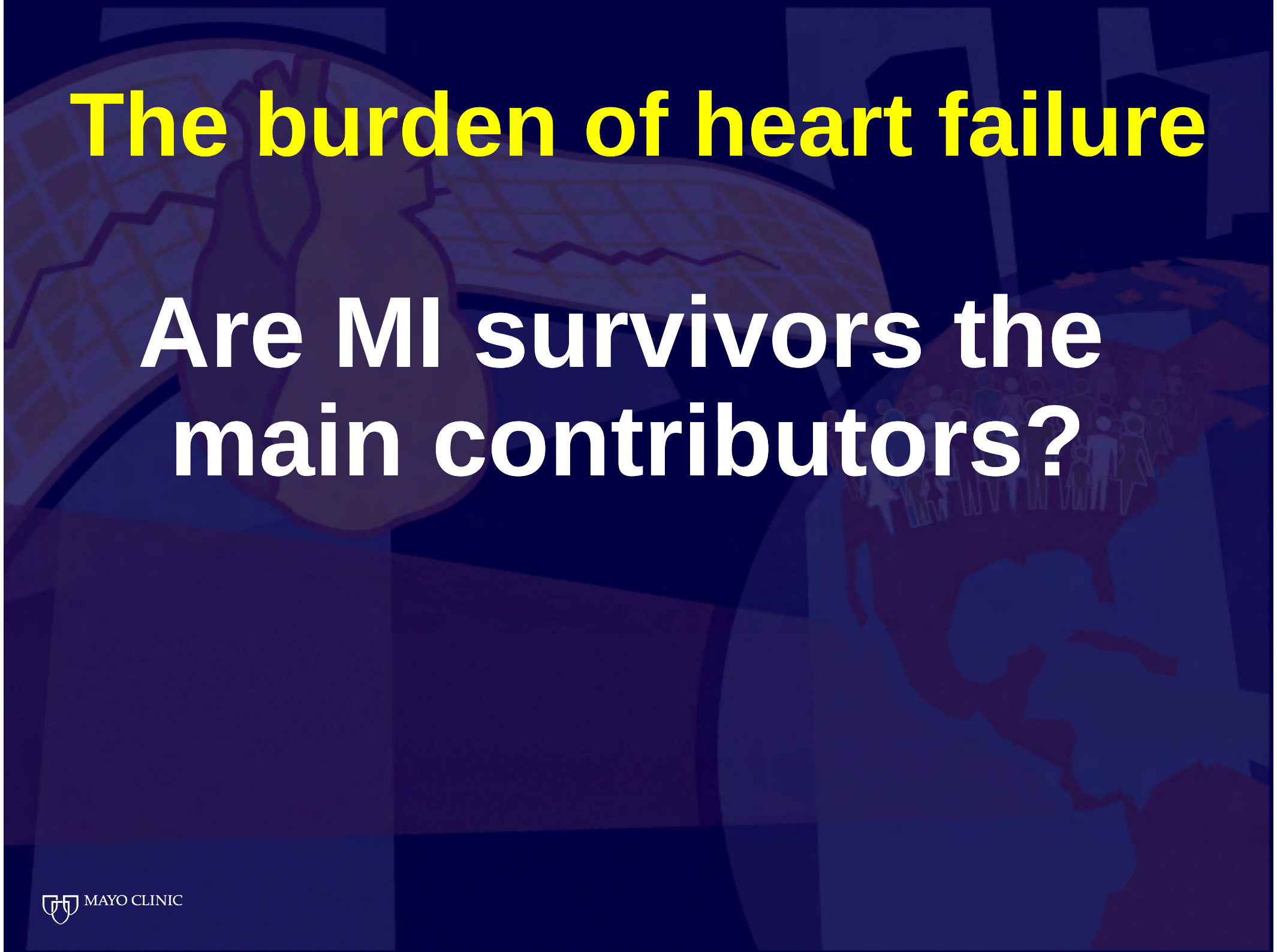
Presented as the 197th Shattuck Lecture to the Annual Meeting of the Massachusetts Medical Society, Boston, May 17, 1997.

©1997, Massachusetts Medical Society.

Downloaded from www.nejm.org at MAYO CLINIC on February 02, 2004.
Copyright © 1997 Massachusetts Medical Society. All rights reserved.

The burden of heart failure

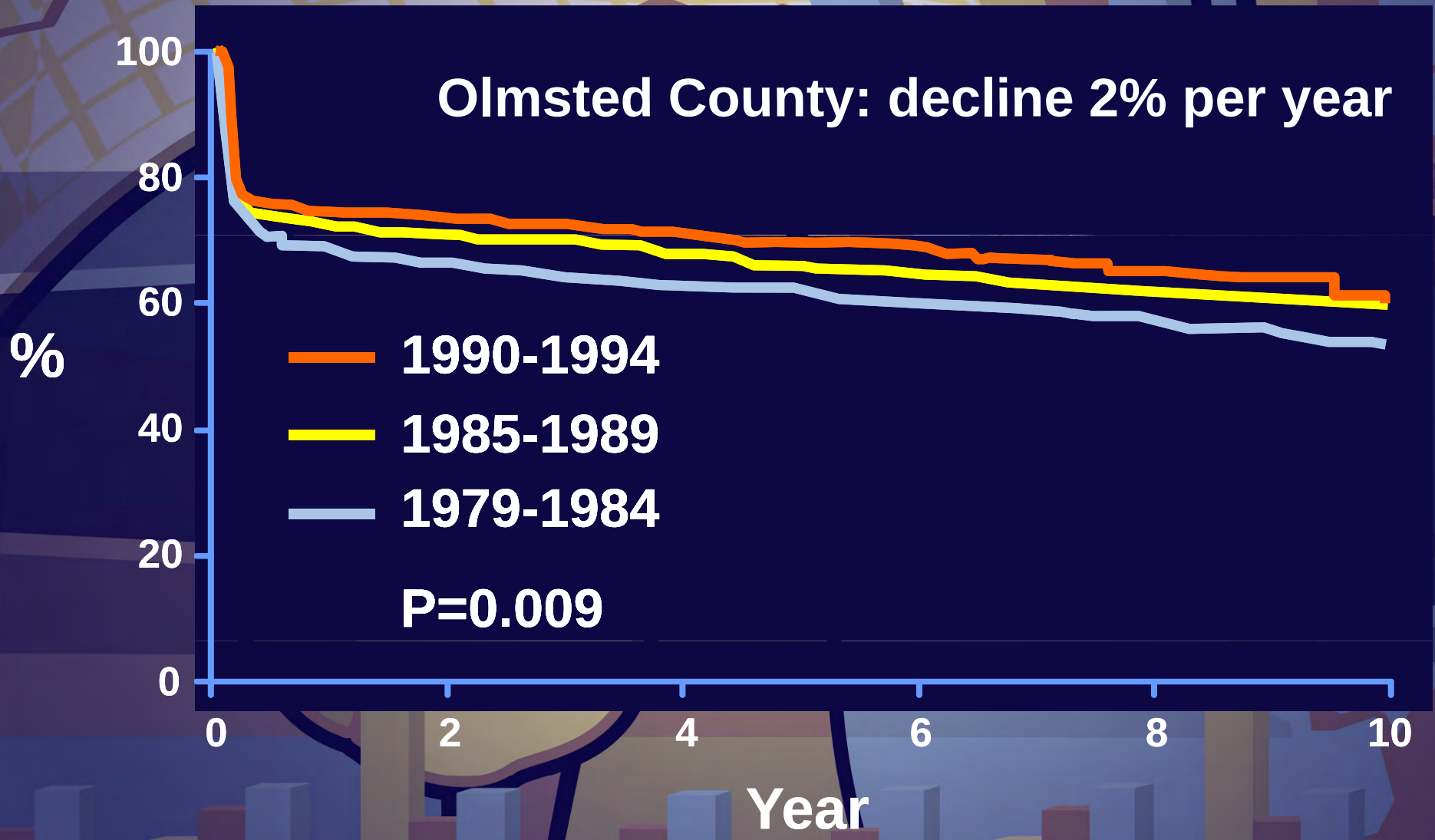
Are MI survivors the main contributors?



MAYO CLINIC

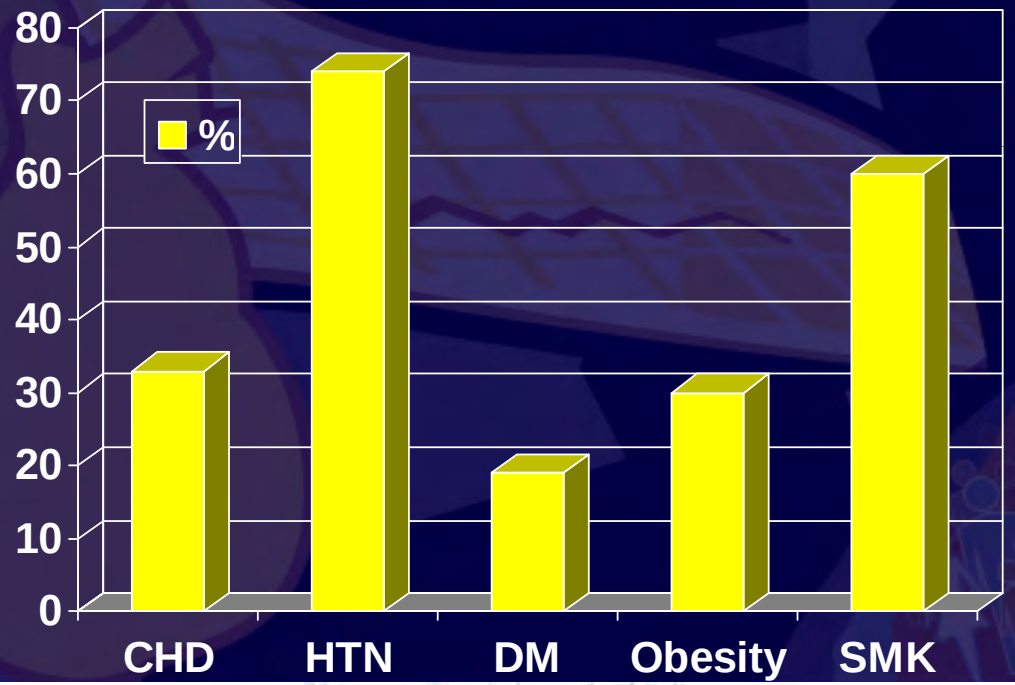
Heart Failure After MI

Framingham: Decline in late post MI HF
Worcester: Decline in in-hospital HF



JP Hellermann- Am J EPI 2003

Risk factors for Heart Failure



Attributable risk

Risk Factor	Odds Ratio (95% CI)	*P* Value	Overall
Coronary heart disease	3.05 (2.36-3.95)	<.001	0.20 (0.16-0.24)
Hypertension	1.44 (1.18-1.76)	<.001	0.20 (0.10-0.30)
Diabetes	2.65 (1.98-3.54)	<.001	0.12 (0.09-0.15)
Obesity	2.00 (1.57-2.55)	<.001	0.12 (0.08-0.16)
Ever smoker	1.37 (1.13-1.68)	.002	0.14 (0.06-0.22)

Dunlay et all , AJM 2009

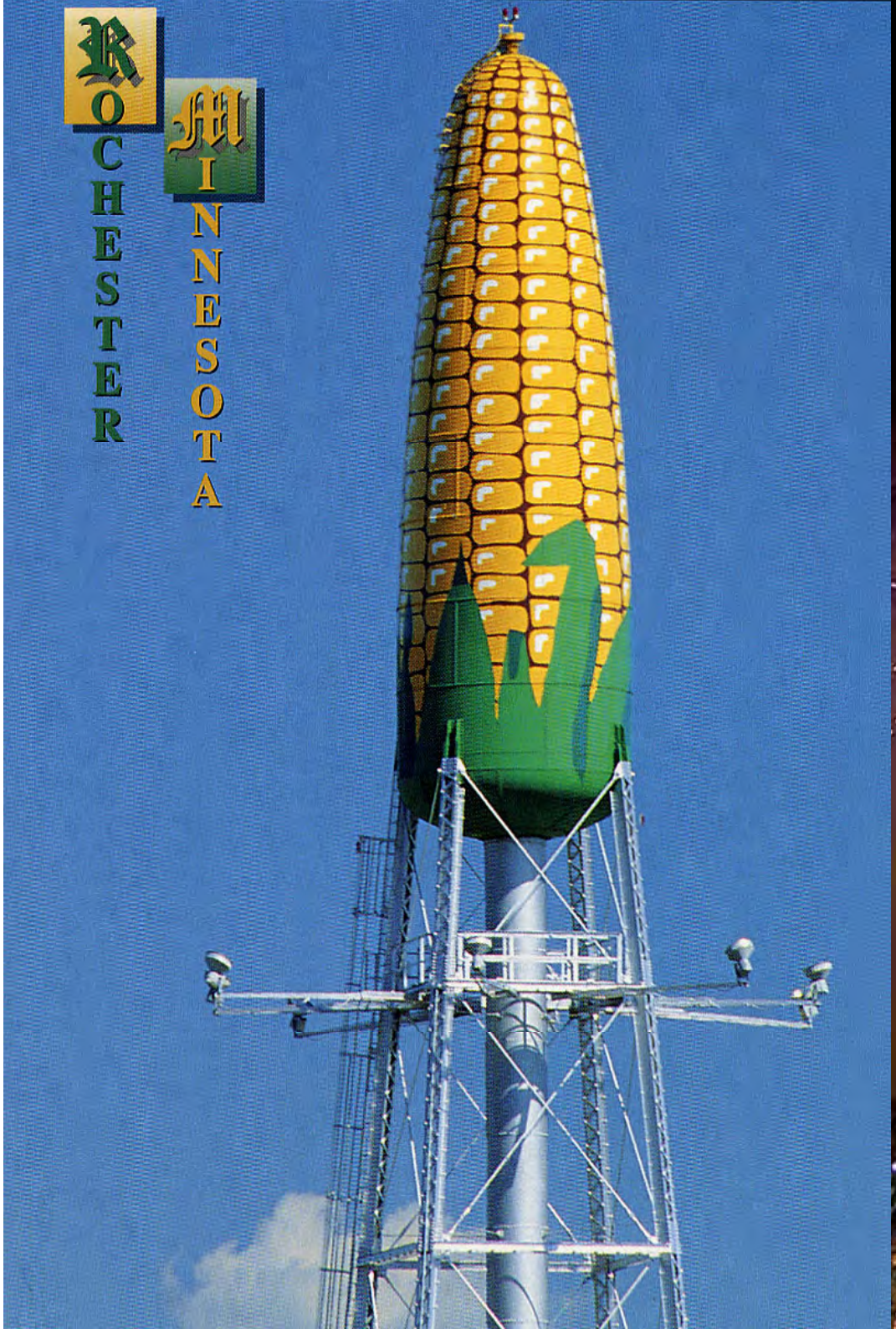
Summary
Temporal trends in CVD

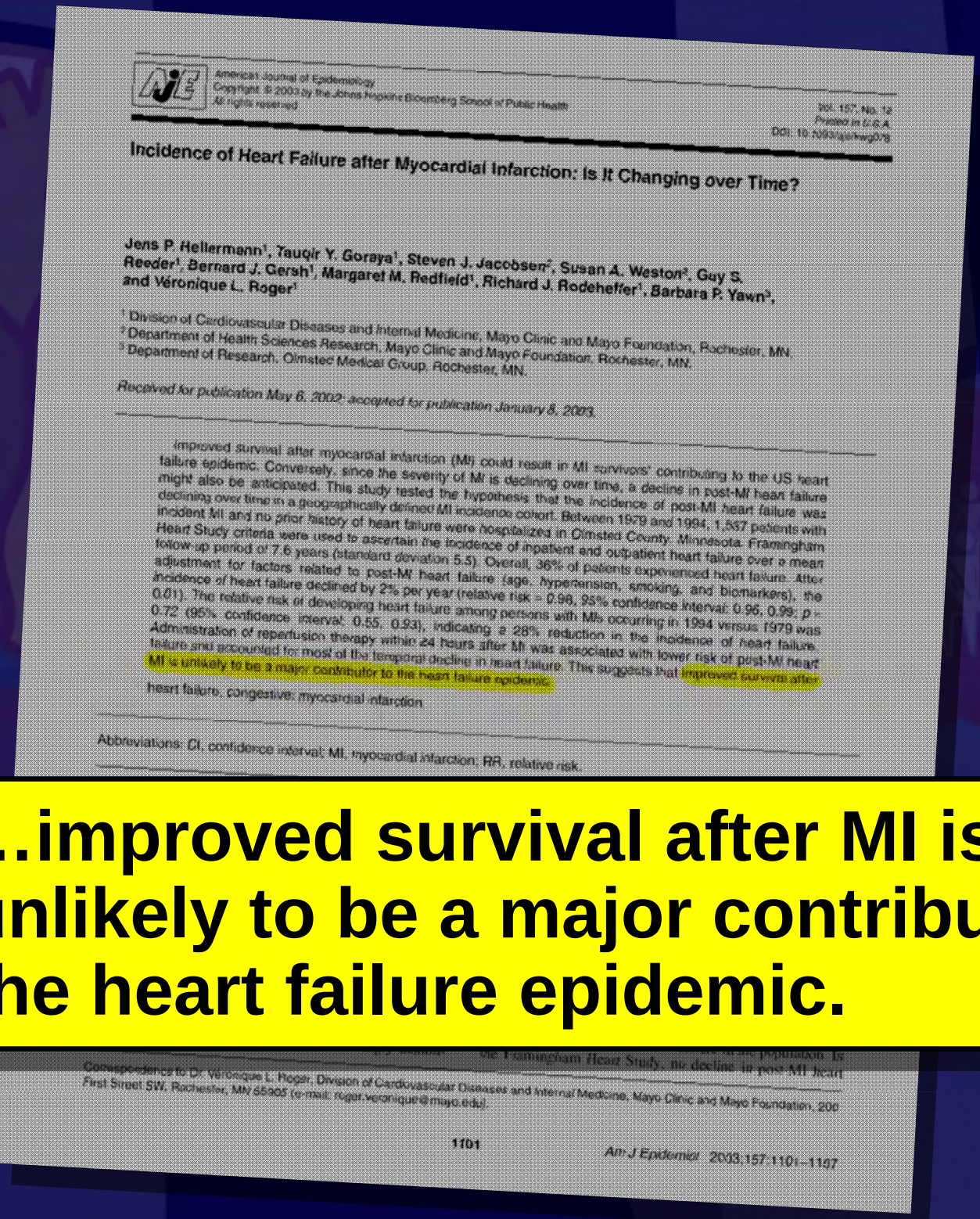
- CVD mortality decline related to both prevention and medical care
- Disproportionate burden among elderly, women and non-whites
- Heart failure is an epidemic of hospitalizations, due to increased prevalence
- Coronary disease and hypertension are 2 big contributors to HF

On Diet & Dying

- The Japanese eat very little fat and suffer fewer heart attacks than the British or Americans.
- The French eat a lot of fat and also suffer fewer heart attacks than the British or Americans.
- The Japanese drink very little red wine and suffer fewer heart attacks than the British or Americans.
- The Italians drink large amounts of red wine and also suffer fewer heart attacks than the British or Americans.
- **CONCLUSION:**
  - Eat and drink what you like.
  - Speaking English is apparently what kills you.


Grazie mille


ROCHESTER
MINNESOTA



American Journal of Epidemiology
Copyright © 2003 by the Johns Hopkins Bloomberg School of Public Health
All rights reserved

Vol. 157, No. 12
Printed in U.S.A.
DOI: 10.1093/aje/kwg078

Incidence of Heart Failure after Myocardial Infarction: Is It Changing over Time?

Jens P. Hellermann[1], Tauqir Y. Goraya[1], Steven J. Jacobsen[2], Susan A. Weston[2], Guy S. Reeder[1], Bernard J. Gersh[1], Margaret M. Redfield[1], Richard J. Rodeheffer[1], Barbara P. Yawn[3], and Véronique L. Roger[1]

[1] Division of Cardiovascular Diseases and Internal Medicine, Mayo Clinic and Mayo Foundation, Rochester, MN.
[2] Department of Health Sciences Research, Mayo Clinic and Mayo Foundation, Rochester, MN.
[3] Department of Research, Olmsted Medical Group, Rochester, MN.

Received for publication May 6, 2002; accepted for publication January 8, 2003.

Improved survival after myocardial infarction (MI) could result in MI survivors' contributing to the US heart failure epidemic. Conversely, since the severity of MI is declining over time, a decline in post-MI heart failure might also be anticipated. This study tested the hypothesis that the incidence of post-MI heart failure was declining over time in a geographically defined MI incidence cohort. Between 1979 and 1994, 1,557 patients with incident MI and no prior history of heart failure were hospitalized in Olmsted County, Minnesota. Framingham Heart Study criteria were used to ascertain the incidence of inpatient and outpatient heart failure over a mean follow-up period of 7.6 years (standard deviation 5.5). Overall, 36% of patients experienced heart failure. After adjustment for factors related to post-MI heart failure (age, hypertension, smoking, and biomarkers), the incidence of heart failure declined by 2% per year (relative risk = 0.98, 95% confidence interval: 0.96, 0.99; $p = 0.01$). The relative risk of developing heart failure among persons with MIs occurring in 1994 versus 1979 was 0.72 (95% confidence interval: 0.55, 0.93), indicating a 28% reduction in the incidence of heart failure. Administration of reperfusion therapy within 24 hours after MI was associated with lower risk of post-MI heart failure and accounted for most of the temporal decline in heart failure. This suggests that improved survival after MI is unlikely to be a major contributor to the heart failure epidemic.

heart failure; congestive; myocardial infarction

Abbreviations: CI, confidence interval; MI, myocardial infarction; RR, relative risk.

…improved survival after MI is unlikely to be a major contributor to the heart failure epidemic.

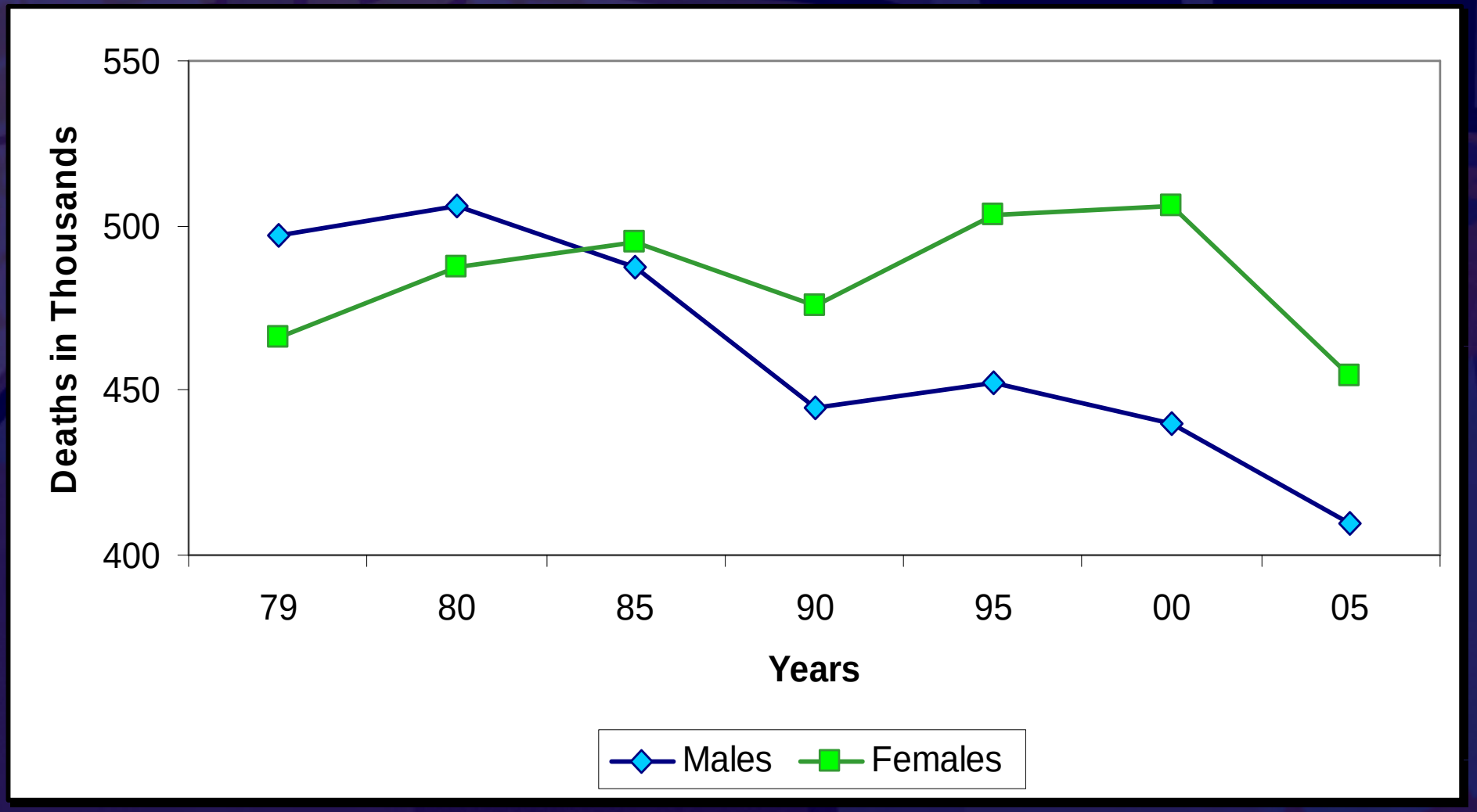
the Framingham Heart Study, no decline in post-MI heart

Correspondence to Dr. Véronique L. Roger, Division of Cardiovascular Diseases and Internal Medicine, Mayo Clinic and Mayo Foundation, 200 First Street SW, Rochester, MN 55905 (e-mail: roger.veronique@mayo.edu).

Surveillance, Epidemiology and End Results

- The Surveillance, Epidemiology and End Results (SEER) Program of the NCI collects information on incidence, survival, and prevalence from specific geographic areas representing 26 percent of the US population and compiles reports on all of these plus cancer mortality for the entire US.
- http://seer.cancer.gov/

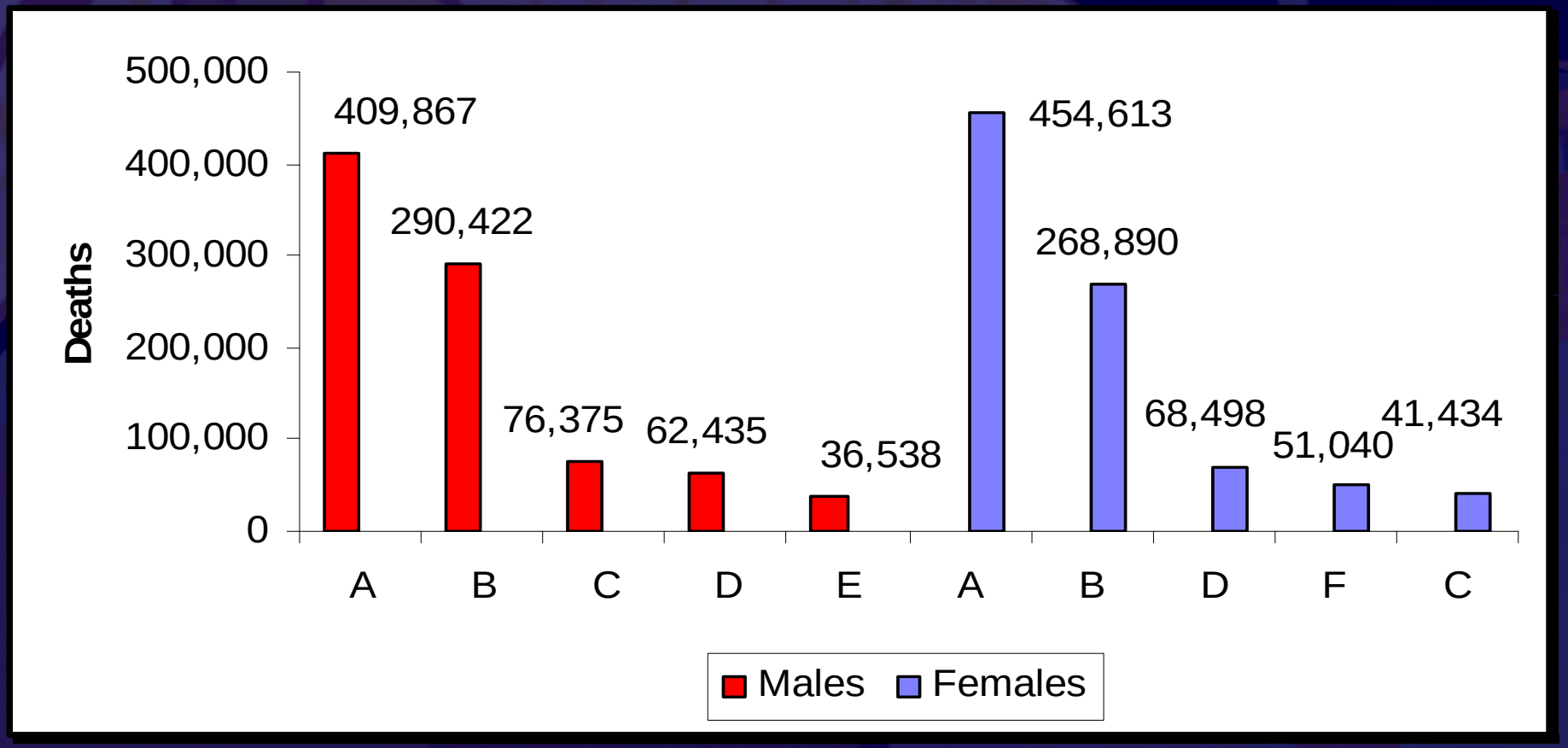
Cardiovascular Deaths



United States: 1979-2005-Source: NCHS and NHLBI

CVD and other major causes of death

United States: 2005--NCHS

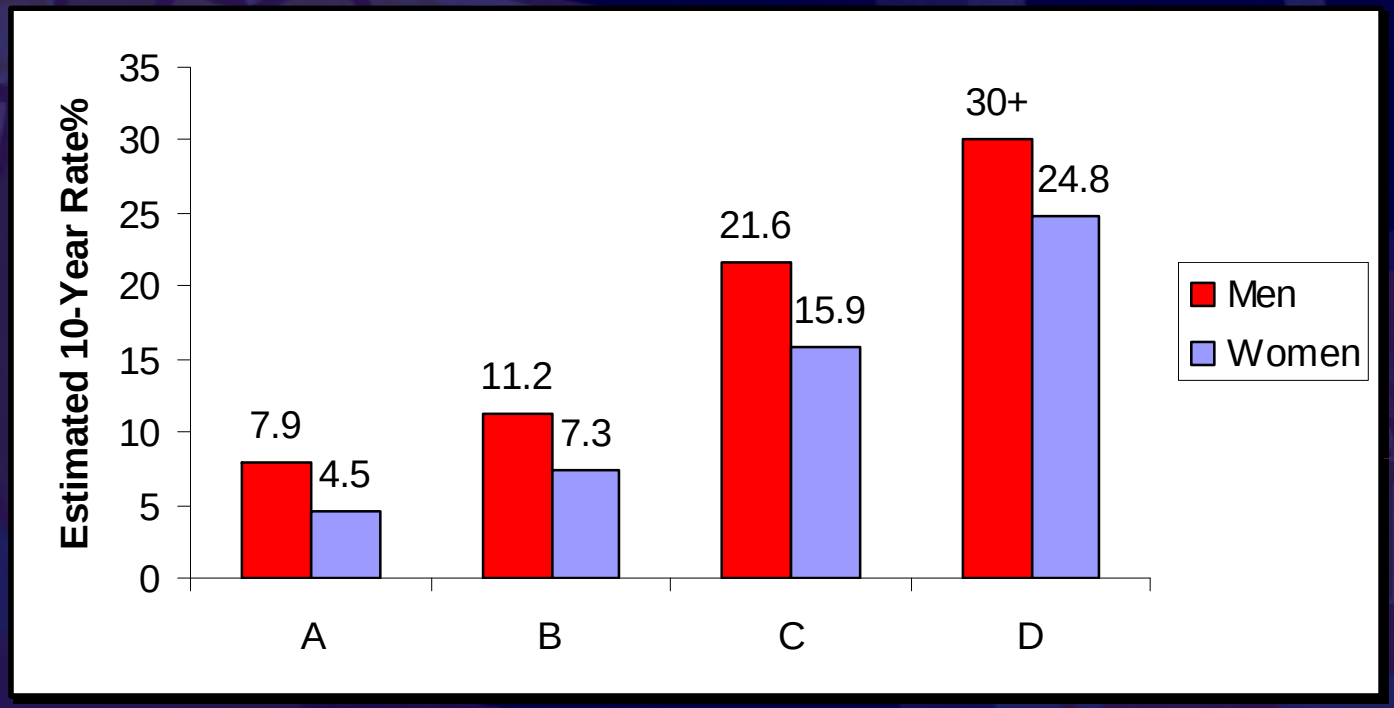


A Total CVD, **B** Cancer, **C** Accidents, **D** Chronic Lower Respiratory Dx, **E** Diabetes Mellitus, **F** Alzheimer's Dx

MAYO CLINIC

americanheart.org

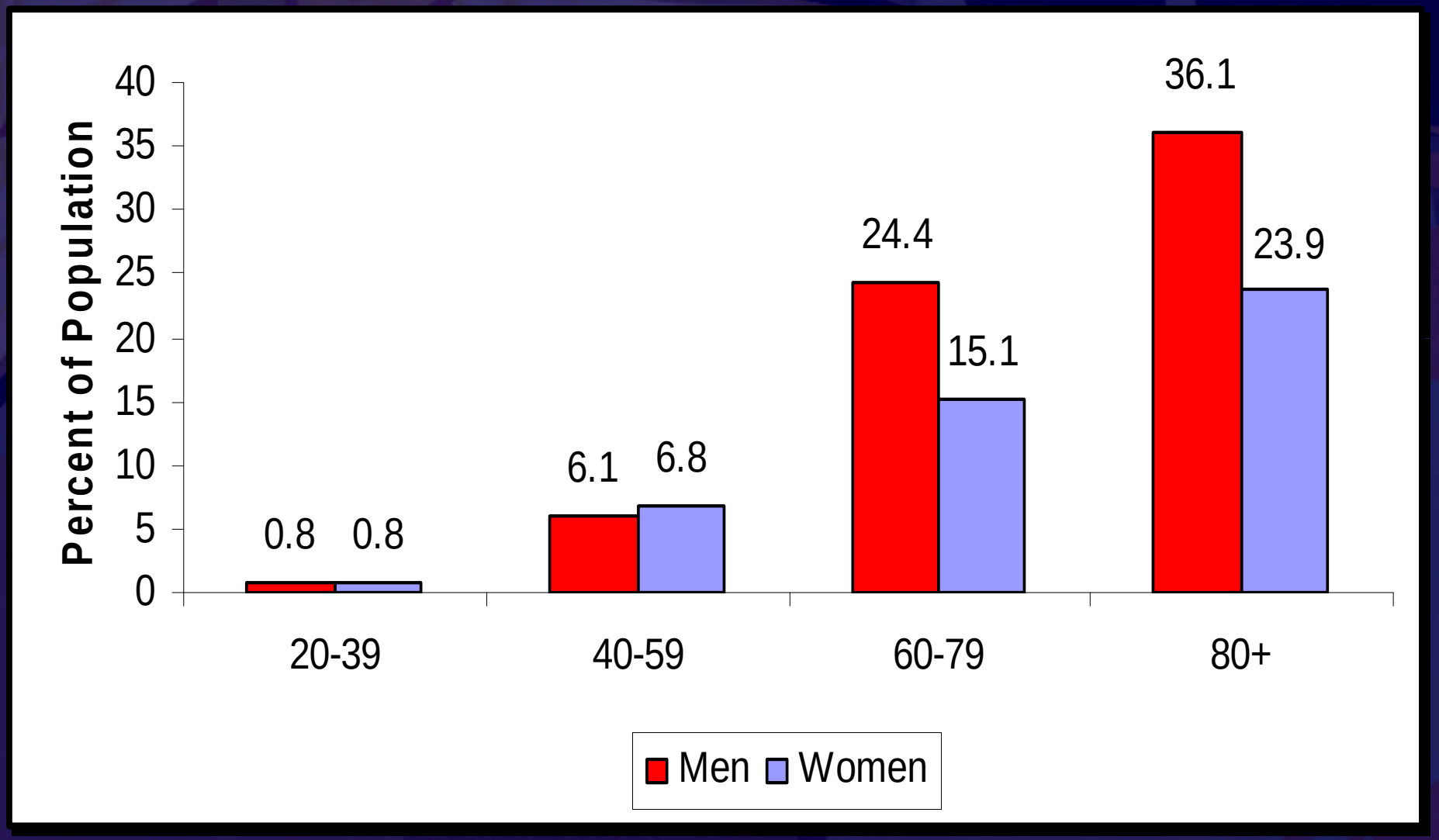
10-Year CVD risk in 50-54-year-old adults Framingham Heart Study



	A	B	C	D
Age	50-54	50-54	50-54	50-54
HDL Cholesterol, mg/dL	45-49	45-49	35-34	35-34
Total Cholesterol (mg/dL)	160-199	200-239	200-239	200-239
Systolic BP mm/Hg, no treat.	120-29	130-139	130-139	130-139
Smoker	No	No	No	Yes
Diabetes	No	No	Yes	Yes

D'Agostino et al., Circulation. 2008;117:743-753

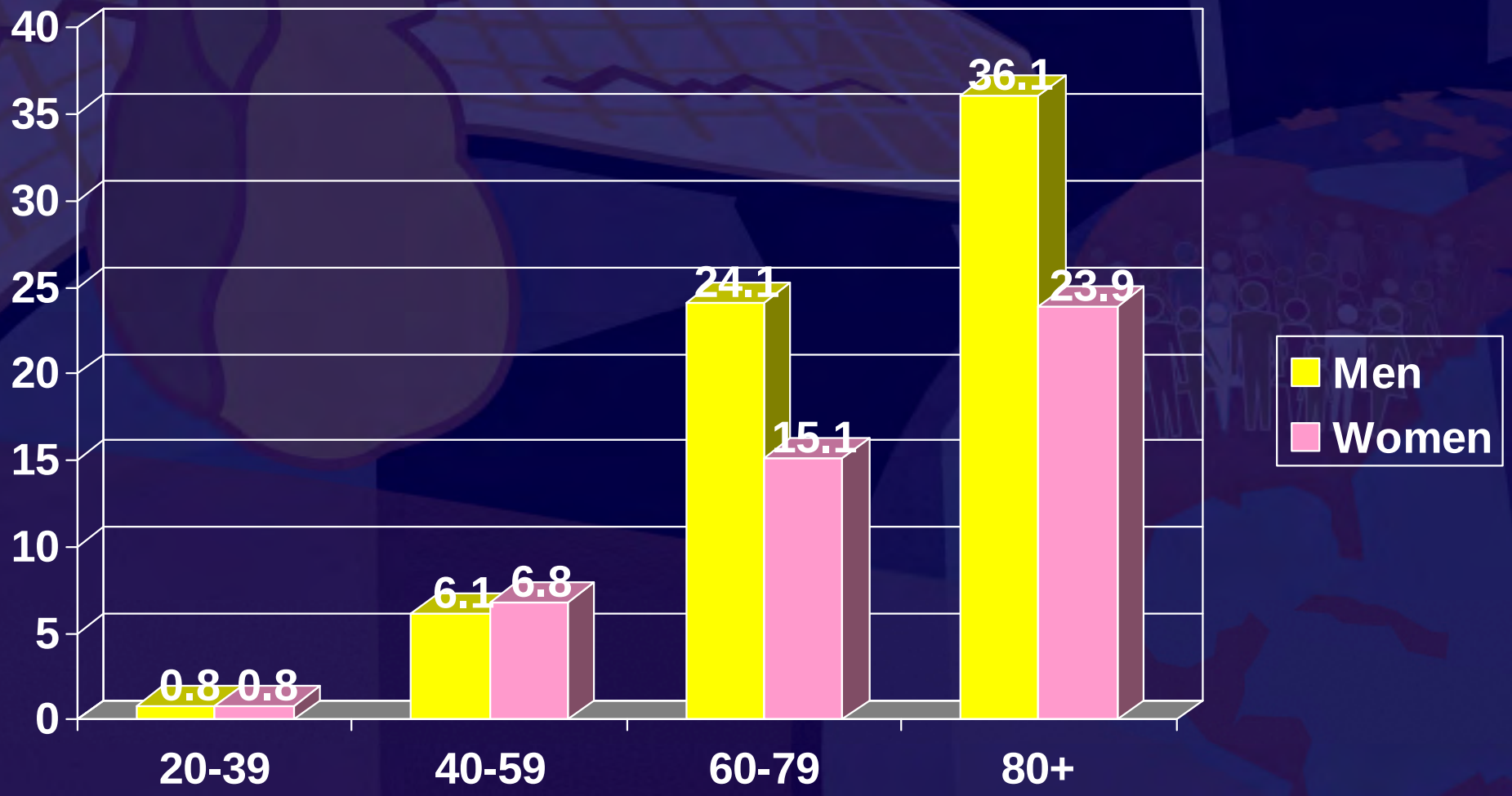
Prevalence of CAD



NHANES:2005-2006---Source: NCHS and NHLBI

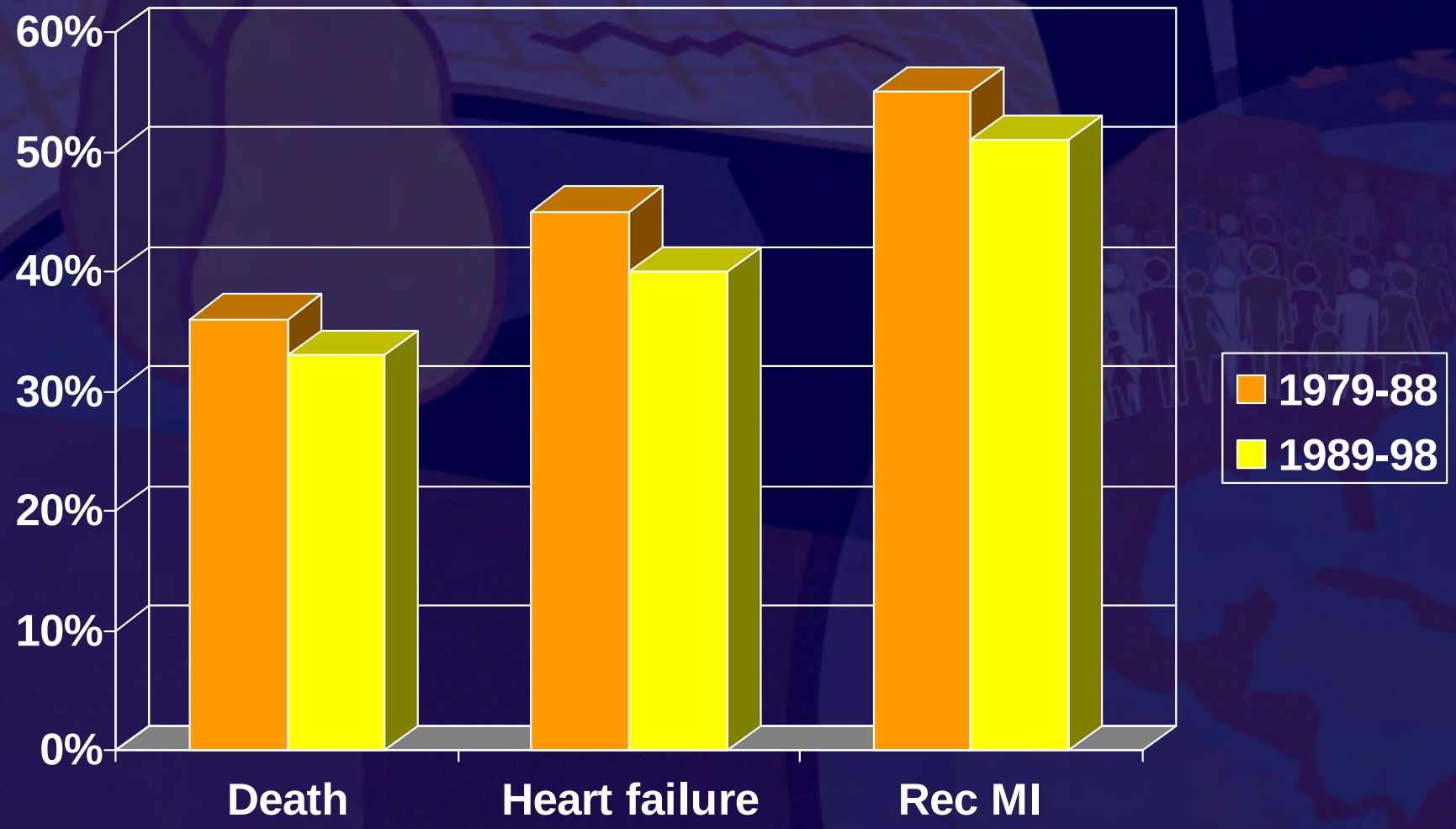
americanheart.org

Prevalence of Coronary Disease



NHANES:2005-2006---Source: NCHS and NHLBI

Events rates at 5 years
2171 incident MIs- Olmsted Co



Roger, Annals 2002---Hellermann, Am J Epi 2003---Jokhadar Am J Epi 2004

ORIGINAL INVESTIGATION

External Validity of Clinical Trials in Acute Myocardial Infarction

Philippe Gabriel Steg, MD; José López-Sendón, MD; Esteban Lopez de Sa, MD; Shaun G. Goodman, MD; Joel M. Gore, MD; Frederick A. Anderson, Jr, PhD; Dominique Himbert, MD; Jeanna Allegrone, MS; Frans Van de Werf, MD; for the GRACE Investigators

Background: Patients enrolled in randomized clinical trials (RCTs) may not reflect those seen in real-life practice. Our goal was to compare patients eligible for enrollment but not enrolled in contemporary RCTs of reperfusion therapy with patients who would have been ineligible and also with patients with acute myocardial infarction (AMI) participating in RCTs.

Methods: Consecutive patients with AMI (n=8469) enrolled in the GRACE registry (Global Registry of Acute Coronary Events) were divided into 3 groups: RCT participants (11%; n=953), eligible nonenrolled patients (55%; n=4669), and ineligible patients (34%; n=2847). Our main outcome measures were hospital mortality rates.

Results: Based on baseline characteristics or GRACE risk-score distribution, RCT participants had the lowest a priori risk of death; eligible patients had a higher risk; and ineligible patients had the highest risk. Actual hospital mortality showed a similar gradient (3
respectively) ($P<.001$). Multivar
ing for baseline risk, use and type
and delay from symptom onset
tently showed a higher mortality
rolled patients than for RCT partici
95% confidence interval, 1.06-2.4
95% confidence interval, 1.24-3.1

Conclusions: Patients with AMI
have a lower baseline risk and exp
ity than nonenrolled patients, even when
eligible. This difference is not entirely ex
ferences in baseline risk, use and typ
therapy, and/or delays in presentatio
essary when extending the findings obtained in RCTs to the general population with AMI.

Arch Intern Med. 2007;167:68-73

Patients with AMI participating in RCTs have a lower baseline risk and experience lower mortality that non-enrolled patients….Caution is necessary when extending the findings obtained in RCTs to the general population with AMI

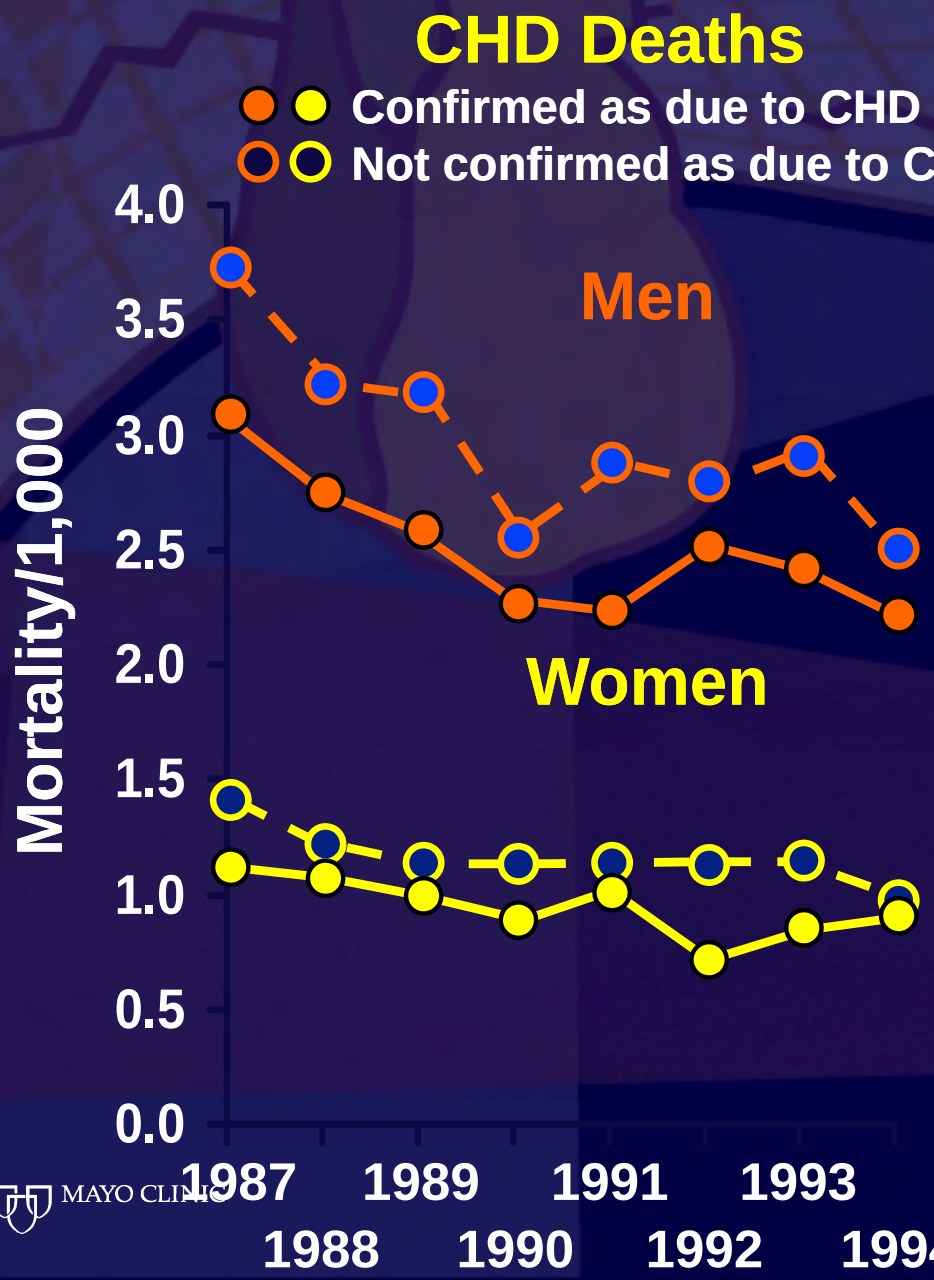
Effectiveness versus efficacy

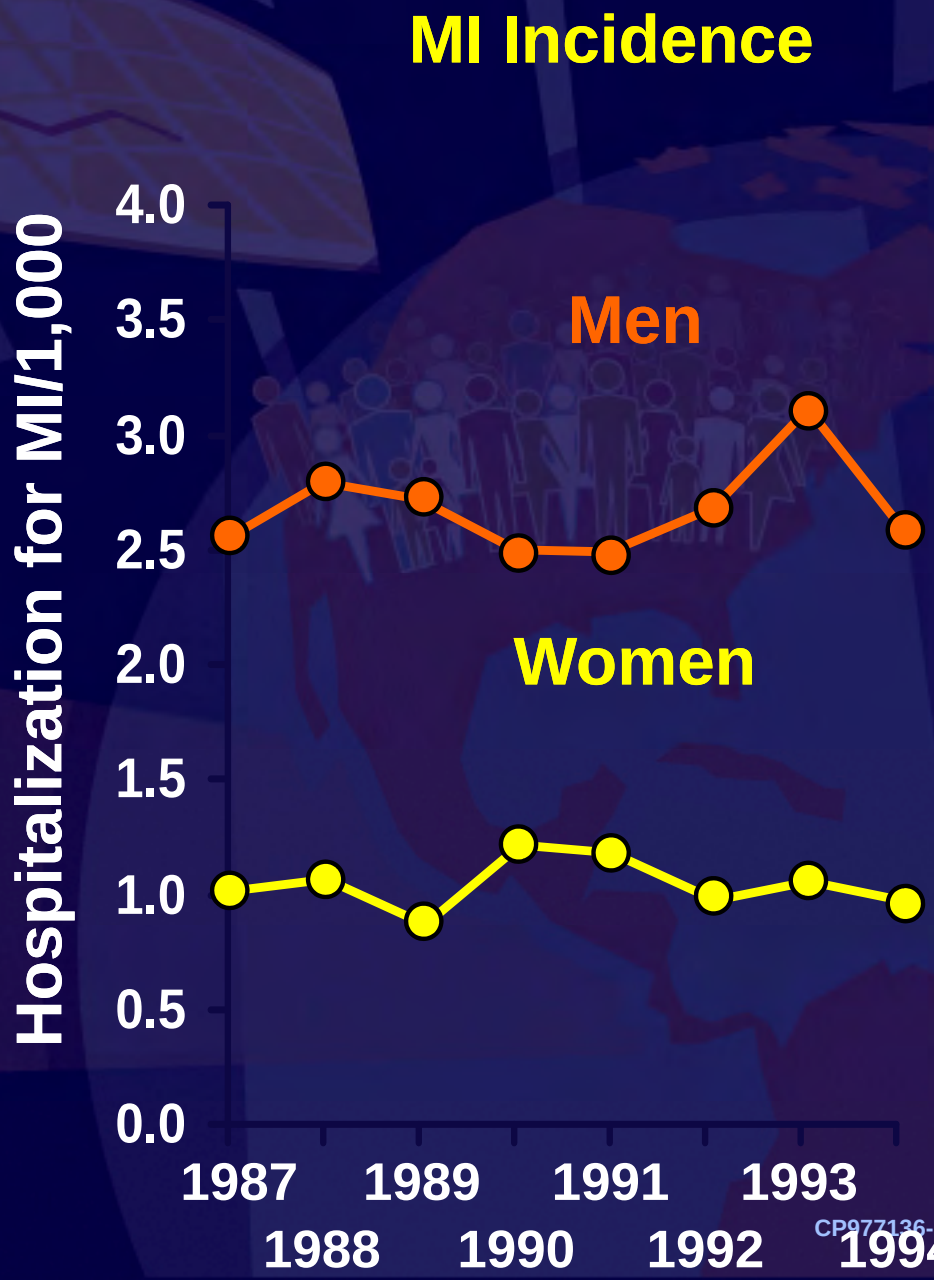
- Randomized trials: External validity challenge

- Physicians not representative
- Participants not representative
- Treatment received is not representative of standard care

CHD Trends–ARIC Study

Rosamond et al, NEJM, 1998

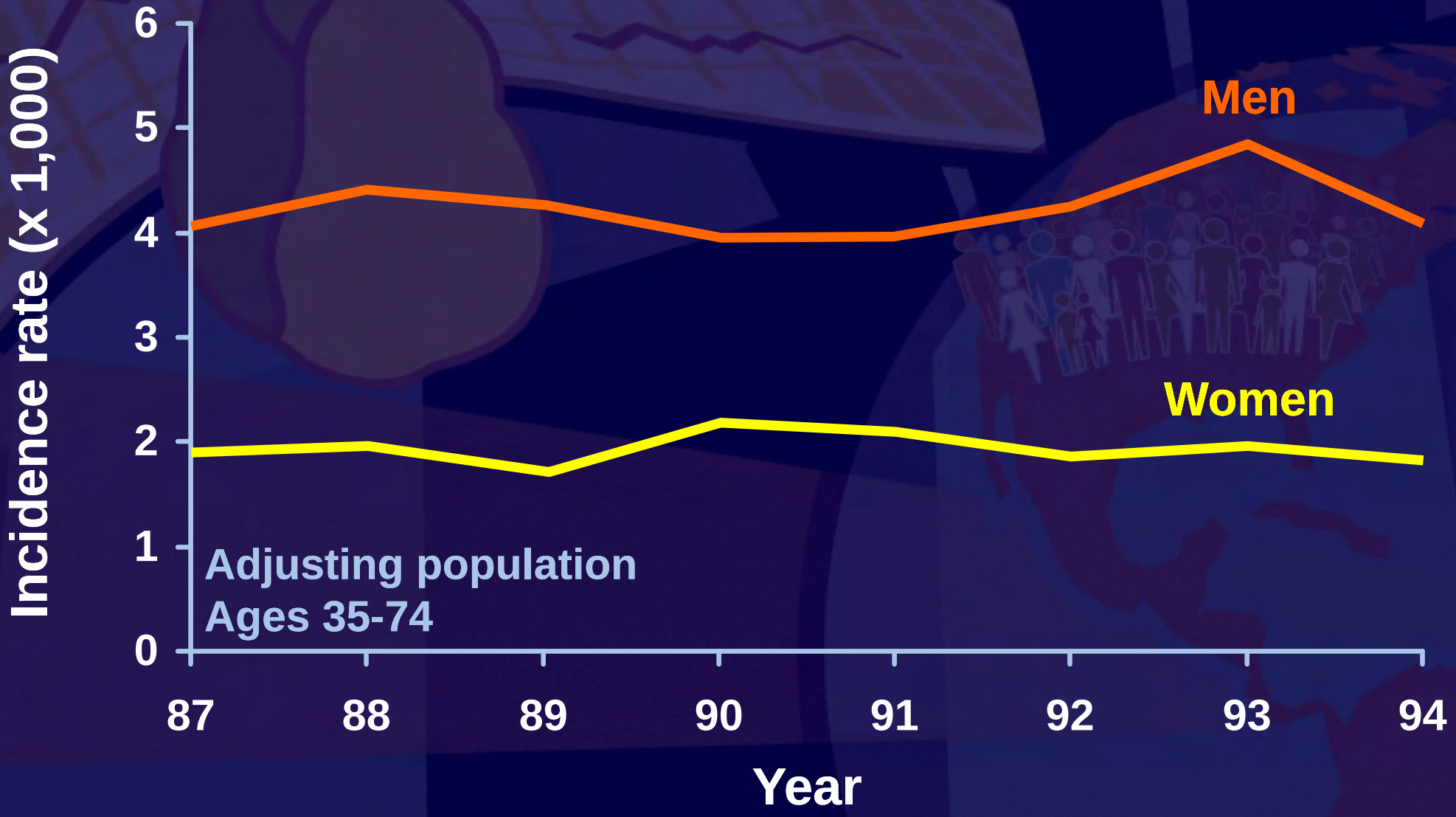




MAYO CLINIC

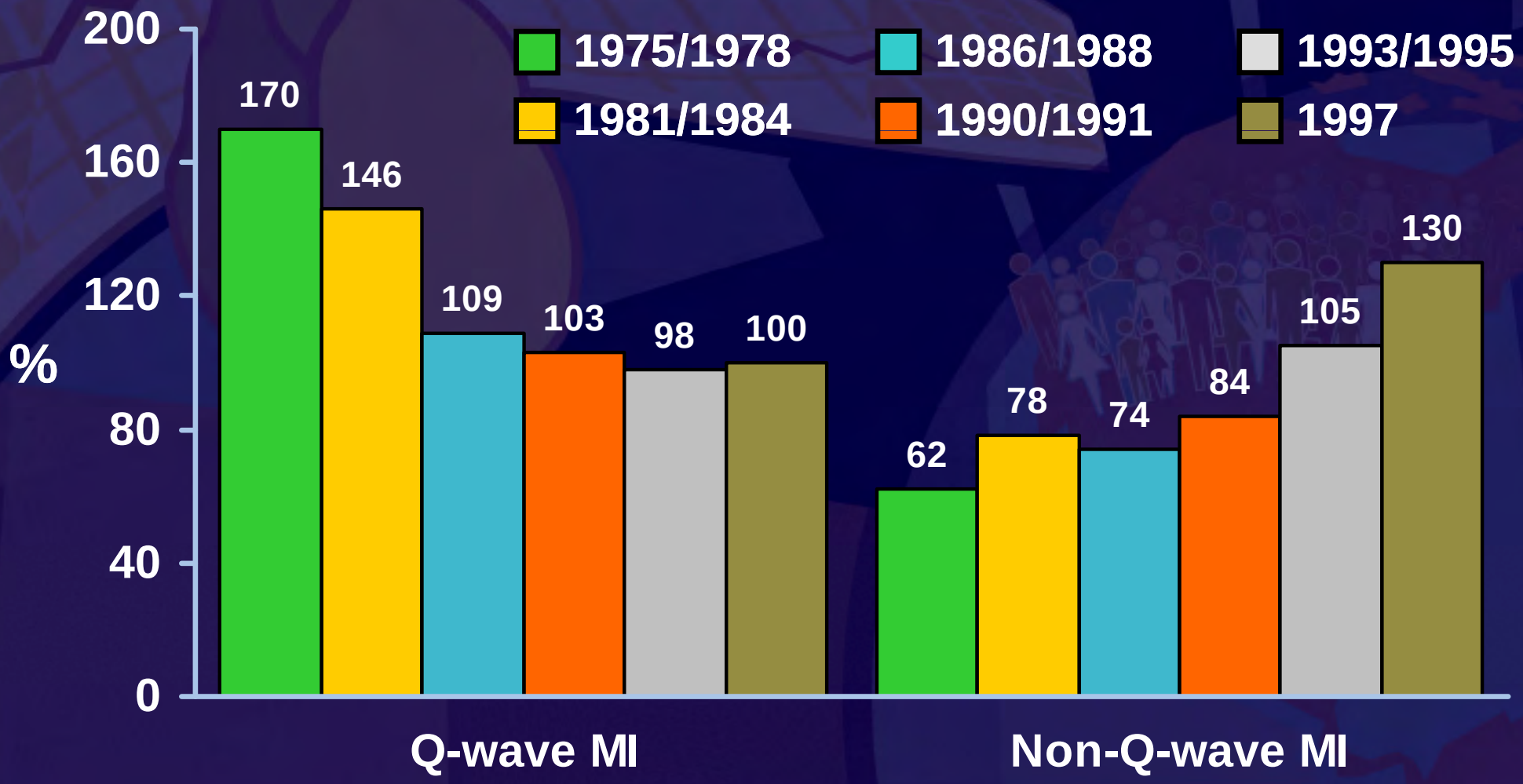
CP977136-7

MI Incidence
ARIC



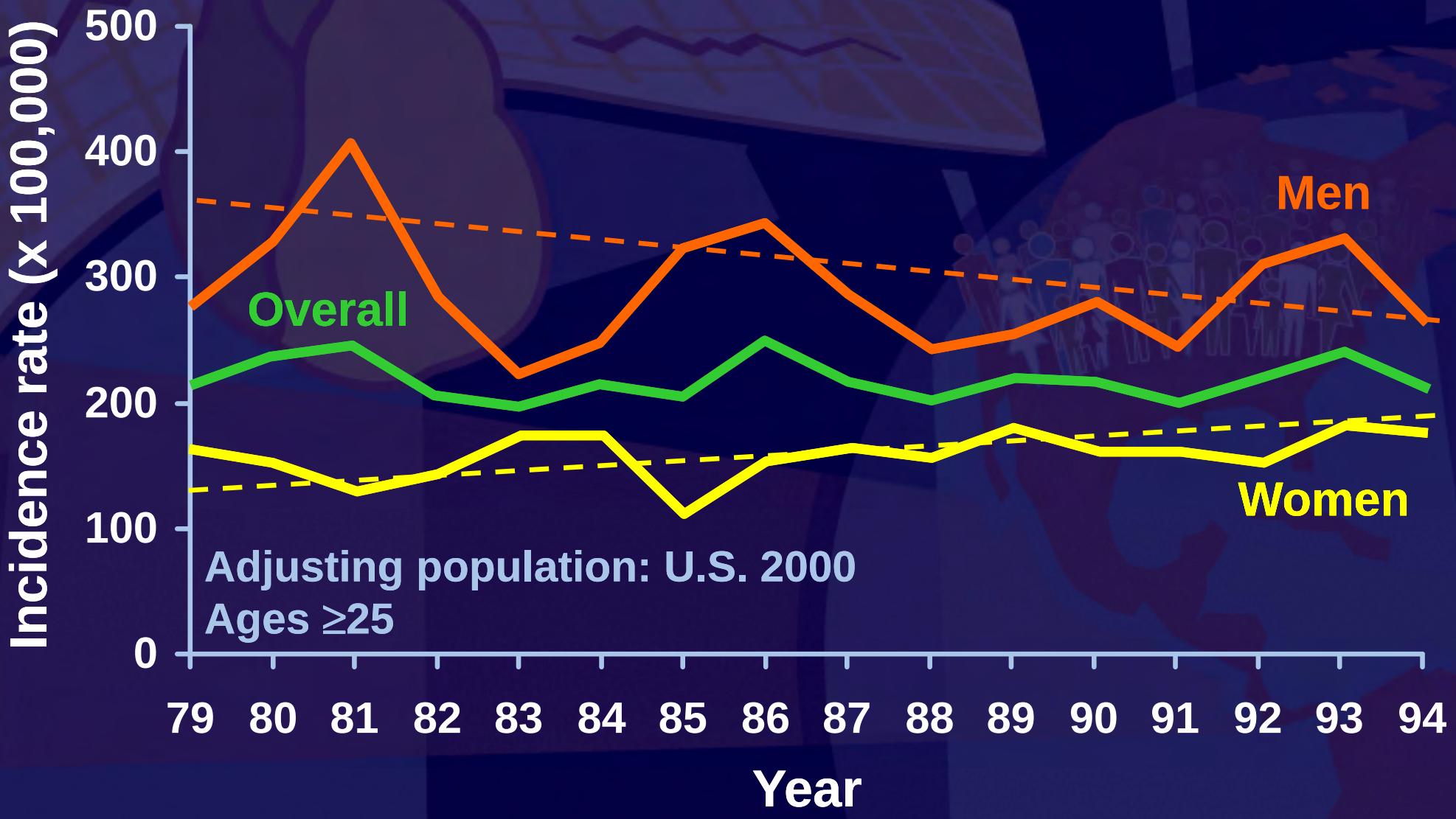
Rosamond et al: NEJM, 1998

MI Incidence
Worcester



Furman et al: JACC, 2001

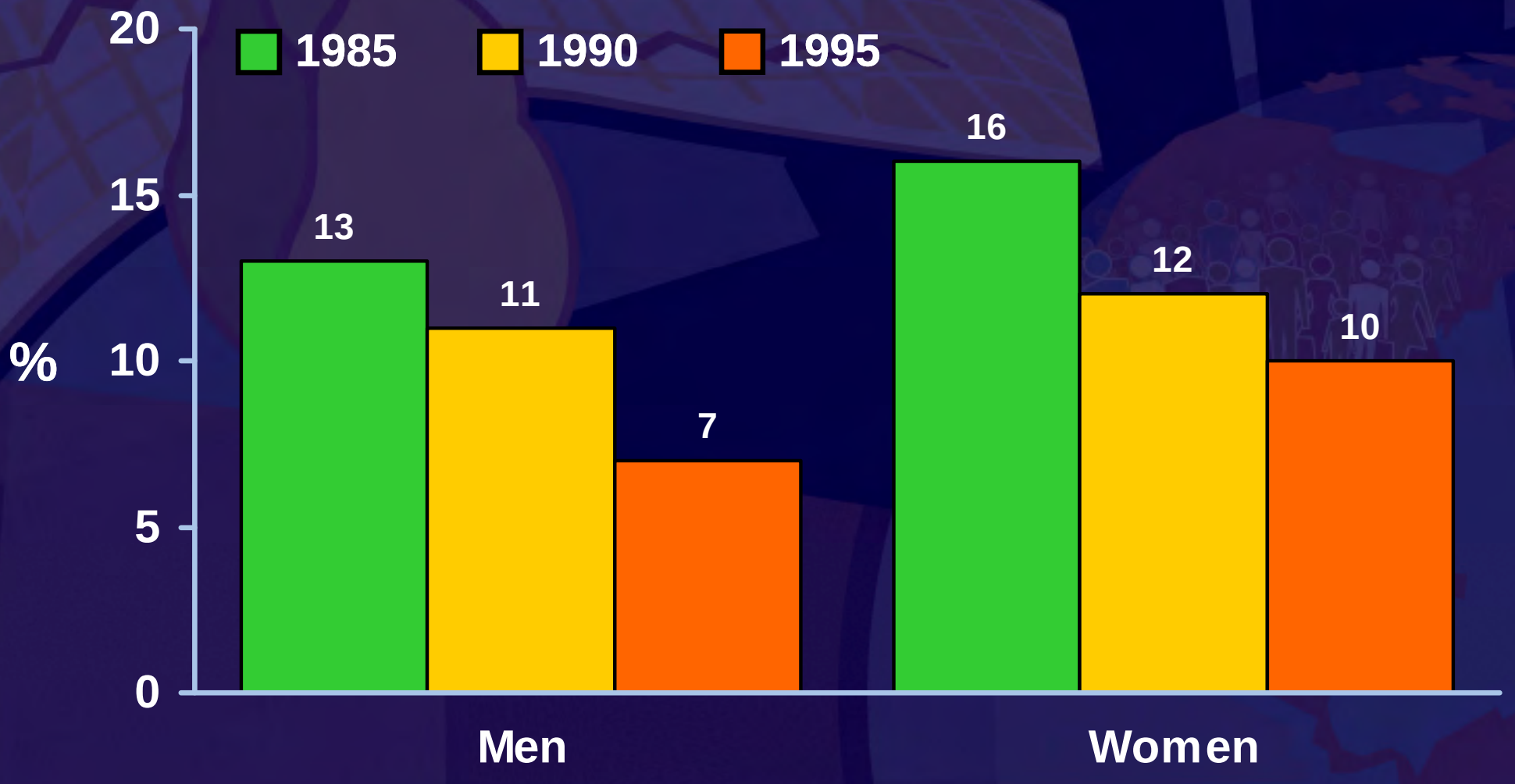
MI Incidence
Olmsted County



Ann Int Med, 2002

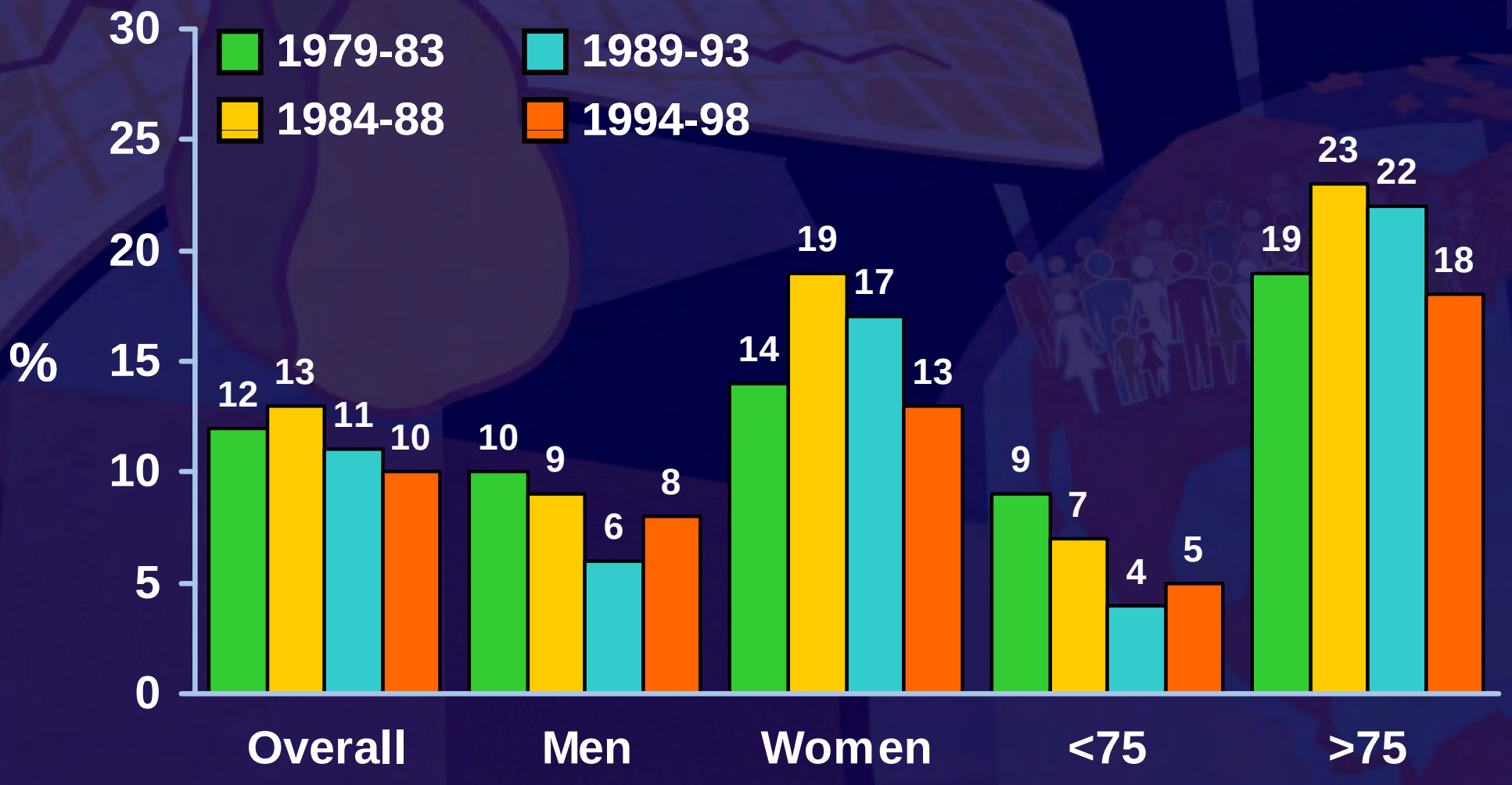
MAYO CLINIC

28-Day Case Fatality Rate
Minnesota Heart Survey



McGovern et al: Circ, 2001

Death Within First Month Post-MI
Olmsted County

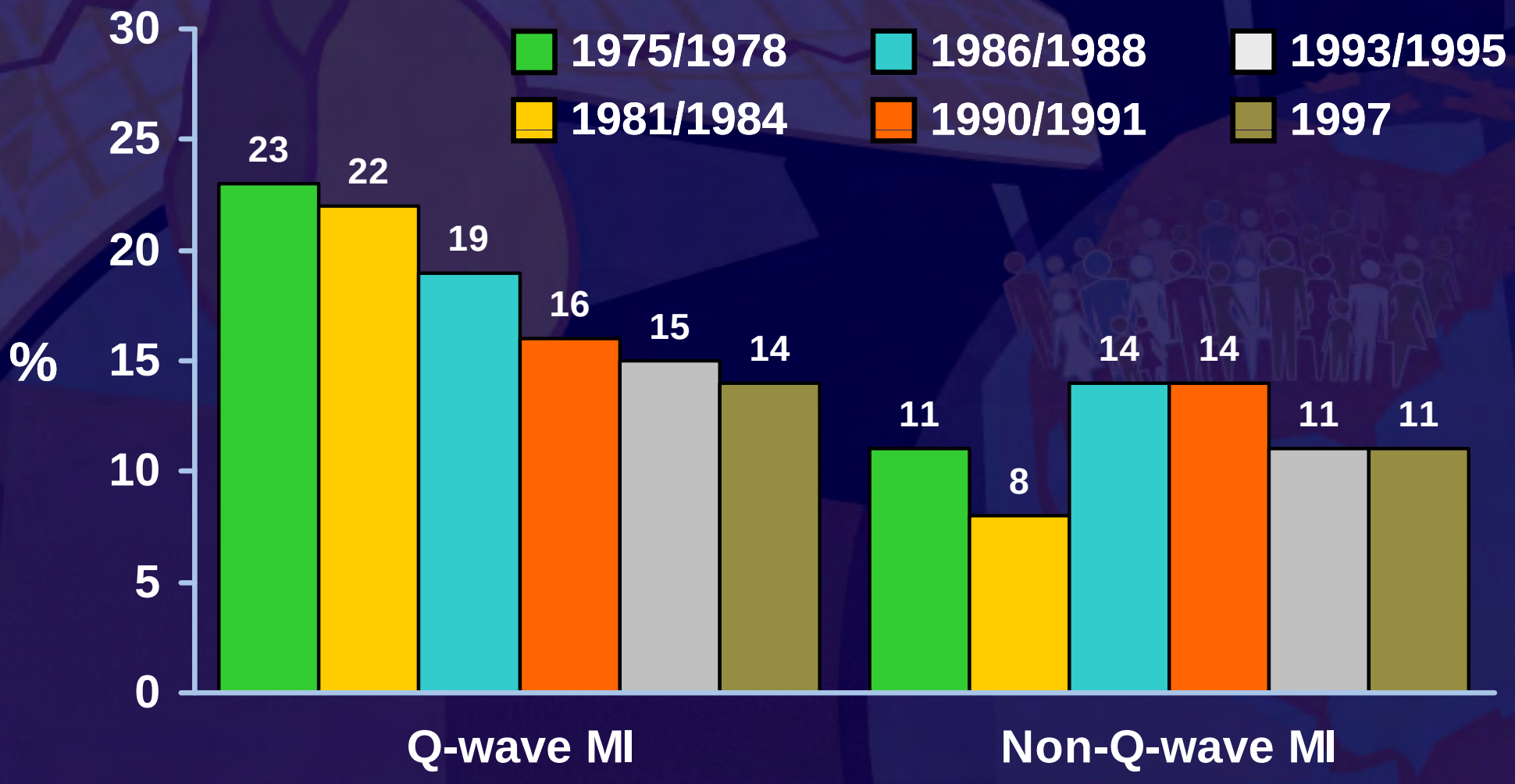


Ann Int Med, 2002

MAYO CLINIC

CP1348386-6

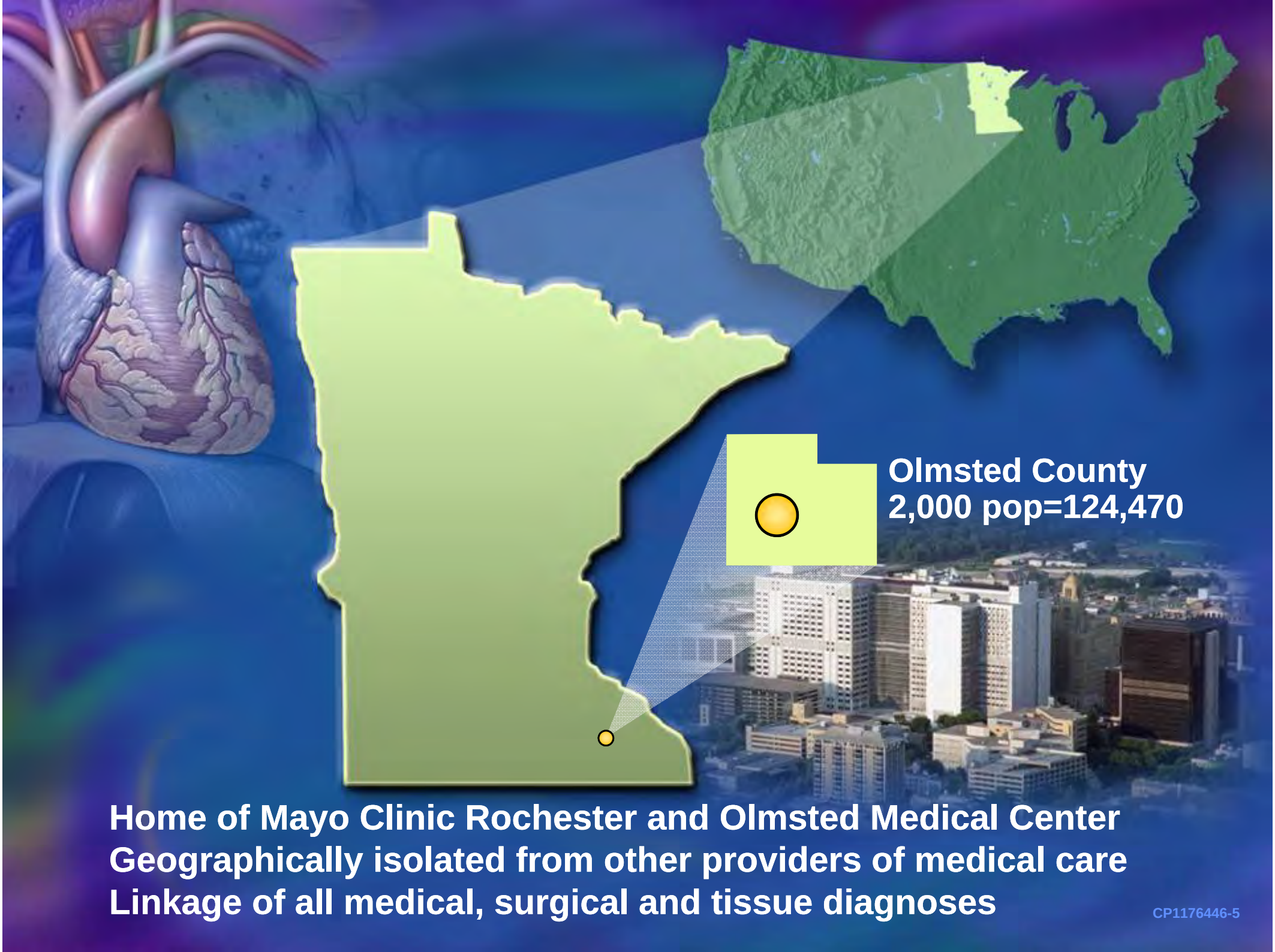
In-Hospital Deaths
Worcester



Furman et al: JACC, 2001

Stages of Epidemiologic Transition as It Pertains to Cardiovascular Diseases

Stages of development	Deaths from CVD (% of total deaths)	Predominant CVDs and risk factors	Regional examples
Age of			
Pestilence and famine	5-10	Rheumatic heart disease, infections, and nutritional cardiomyopathies	Sub-Saharan Africa, rural India, South America
Receding pandemics	10-35	As above + hypertensive heart disease and hemorrhagic strokes	China
Degenerative and man-made diseases	35-65	All forms of strokes, ischemic heart disease at young ages, increasing obesity, and diabetes	Urban India, former socialist economies, aboriginal communities
Delayed degenerative diseases	<50	Stroke and ischemic heart disease at old age	Western Europe, North America, Australia, New Zealand
Health regression and social upheaval	35-55	Re-emergence of deaths from rheumatic heart disease, infections, increased alcoholism and violence; increase in ischemic and hypertensive diseases in the young	Russia

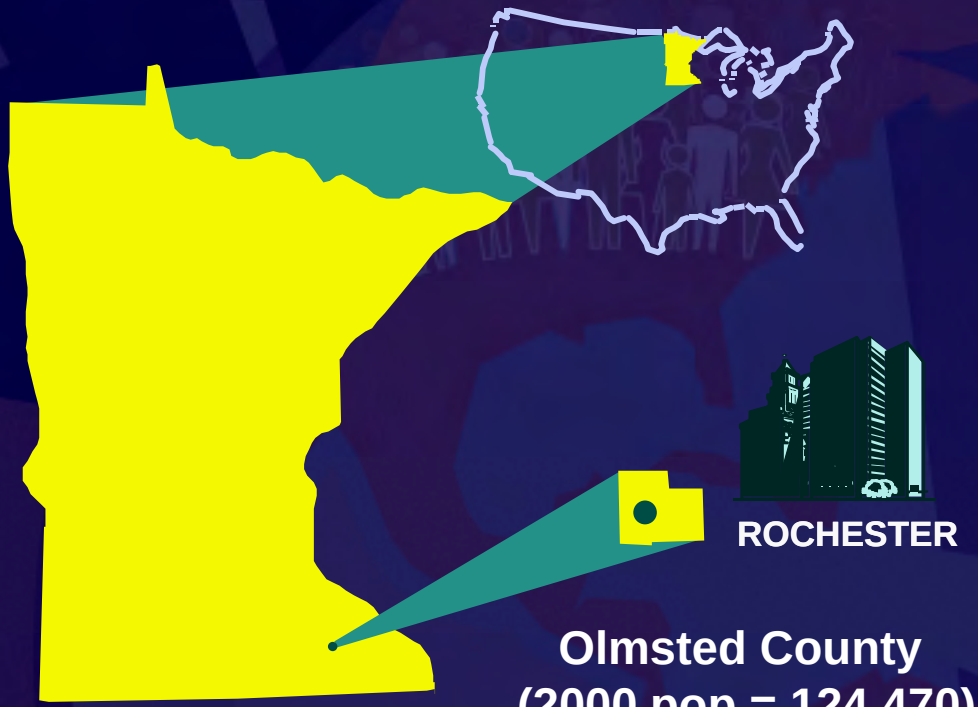


Home of Mayo Clinic Rochester and Olmsted Medical Center
Geographically isolated from other providers of medical care
Linkage of all medical, surgical and tissue diagnoses

Rochester Epidemiology Project

Olmsted County MN

- Home of Mayo Clinic Rochester and Olmsted Medical Center
- Geographically isolated from other providers of medical care
- Extensive indices of medical diagnoses, surgical procedures, tissue diagnoses
- Median duration of medical history available = 43 years

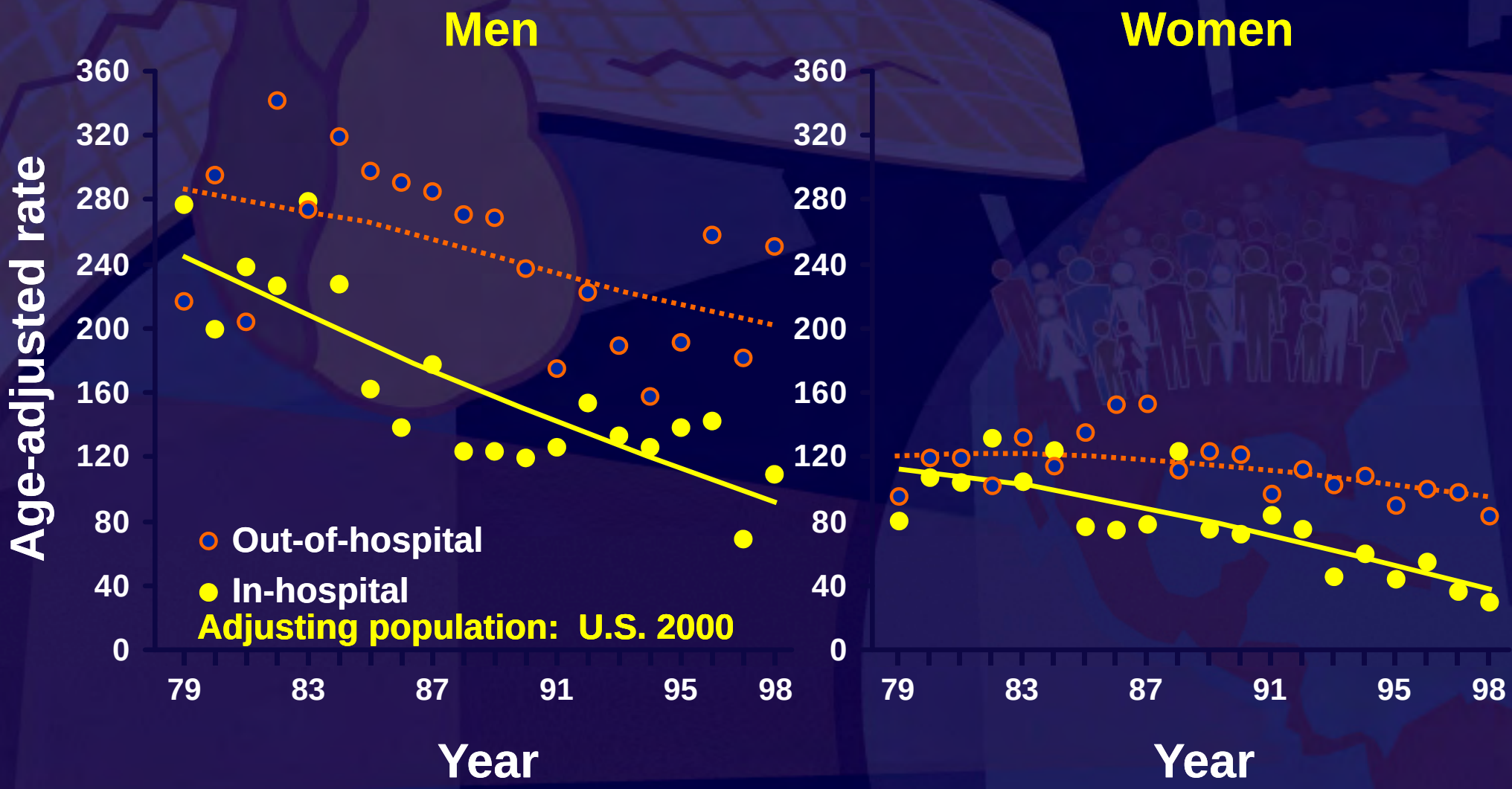


Incidence of Heart Failure in Olmsted County

JAMA 2004

	Men		Women	
	Incidence/ 100,000 (95% CI)	RR (95% CI)	Incidence/ 100,000 (95% CI)	RR (95% CI)
1979-1984	360 (323-396)	1	284 260-307)	1
1985-1990	390 (354-425)	1.07 (0.94-1.22)	292 (270-315)	1.04 (0.93-1.16)
1991-1995	375 (340-409)	1.01 (0.88-1.15)	260 (238-282)	0.93 (0.83-1.05)
1996-2000	383 (351-415)	1.04 (0.92-1.18)	315 (292-338)	1.11 (1.00-1.24)

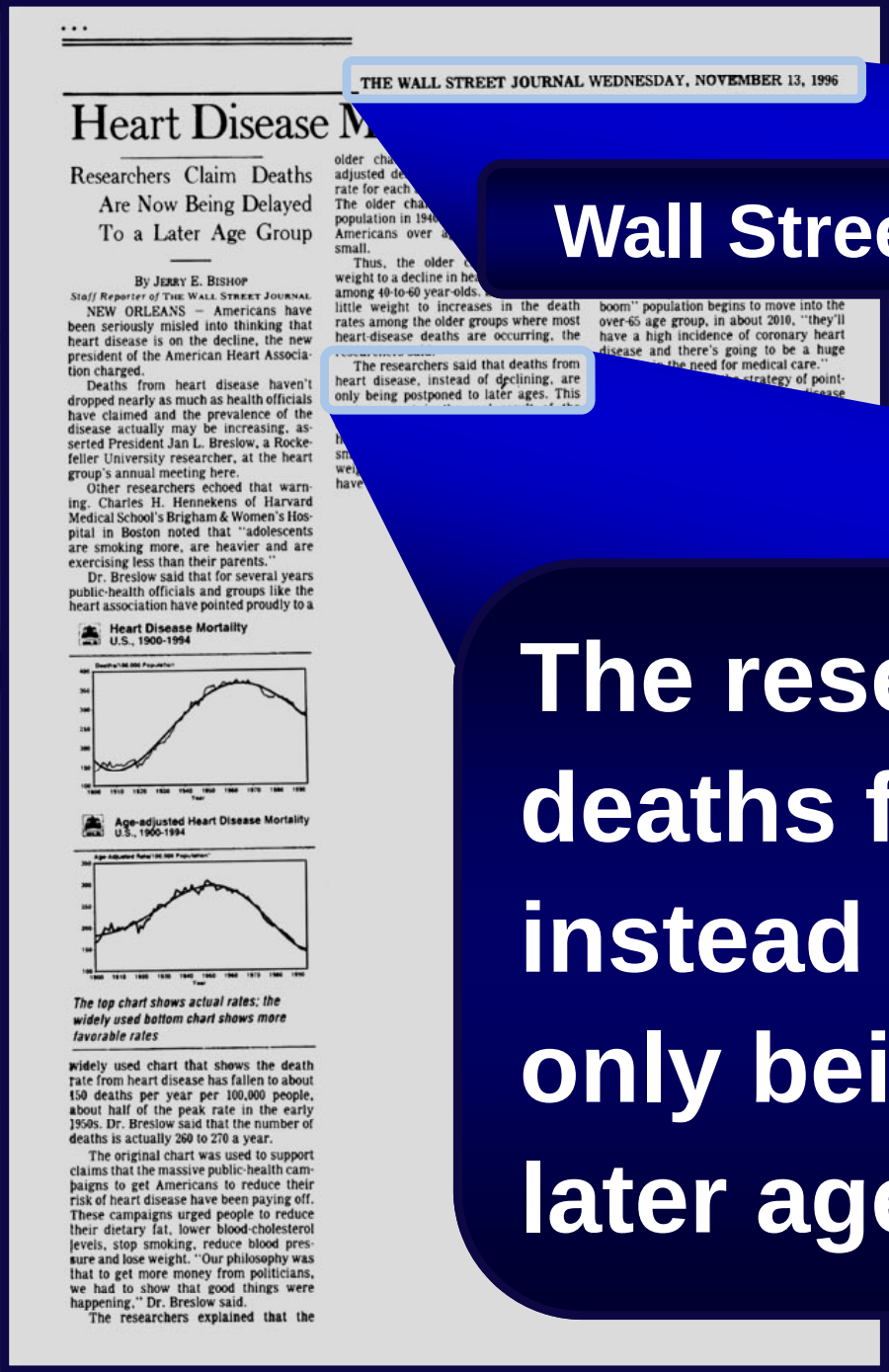
CHD Deaths – Olmsted County



Goraya TG: AJ Epi, 2002

MAYO CLINIC

CP979616-2



THE WALL STREET JOURNAL WEDNESDAY, NOVEMBER 13, 1996

Heart Disease M

Researchers Claim Deaths Are Now Being Delayed To a Later Age Group

By JERRY E. BISHOP
Staff Reporter of THE WALL STREET JOURNAL

NEW ORLEANS — Americans have been seriously misled into thinking that heart disease is on the decline, the new president of the American Heart Association charged.

Deaths from heart disease haven't dropped nearly as much as health officials have claimed and the prevalence of the disease actually may be increasing, asserted President Jan L. Breslow, a Rockefeller University researcher, at the heart group's annual meeting here.

Other researchers echoed that warning. Charles H. Hennekens of Harvard Medical School's Brigham & Women's Hospital in Boston noted that "adolescents are smoking more, are heavier and are exercising less than their parents."

Dr. Breslow said that for several years public-health officials and groups like the heart association have pointed proudly to a

Heart Disease Mortality
U.S., 1900-1994

Age-adjusted Heart Disease Mortality
U.S., 1900-1994

The top chart shows actual rates; the widely used bottom chart shows more favorable rates

widely used chart that shows the death rate from heart disease has fallen to about 150 deaths per year per 100,000 people, about half of the peak rate in the early 1950s. Dr. Breslow said that the number of deaths is actually 260 to 270 a year.

The original chart was used to support claims that the massive public-health campaigns to get Americans to reduce their risk of heart disease have been paying off. These campaigns urged people to reduce their dietary fat, lower blood-cholesterol levels, stop smoking, reduce blood pressure and lose weight. "Our philosophy was that to get more money from politicians, we had to show that good things were happening," Dr. Breslow said.

The researchers explained that the older cha... adjusted de... rate for each ... The older cha... population in 194... Americans over a... small.

Thus, the older ... weight to a decline in he... among 40-to-60 year-olds. ... little weight to increases in the death rates among the older groups where most heart-disease deaths are occurring, the

The researchers said that deaths from heart disease, instead of declining, are only being postponed to later ages. This

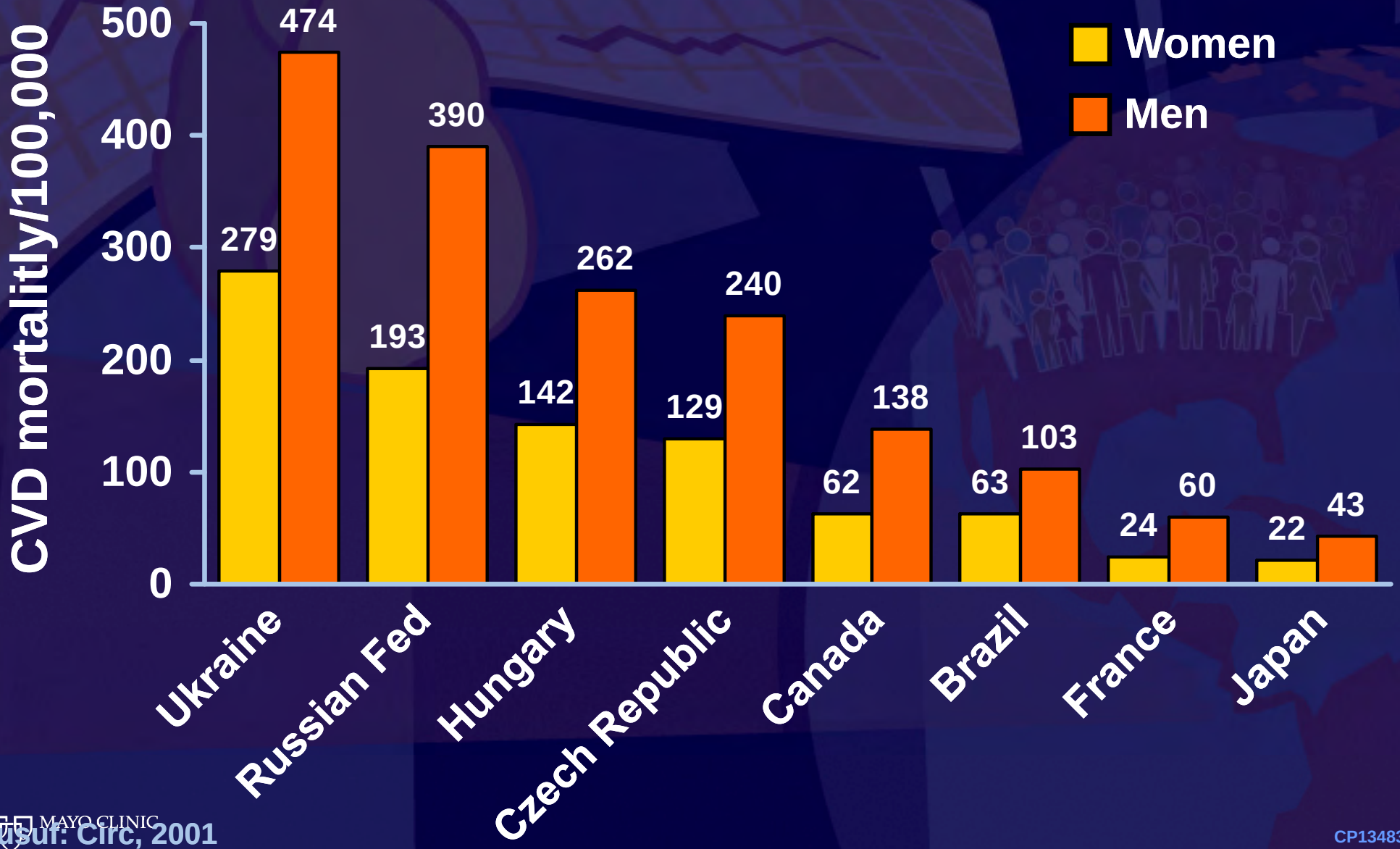
boom" population begins to move into the over-65 age group, in about 2010, "they'll have a high incidence of coronary heart disease and there's going to be a huge ... the need for medical care."

... strategy of point- ... disease

Wall Street Journal, Nov 13, 1996

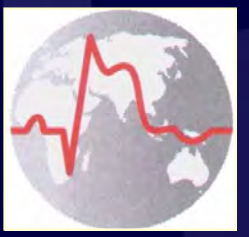
The researchers said that deaths from heart disease, instead of declining, are only being postponed to later ages.

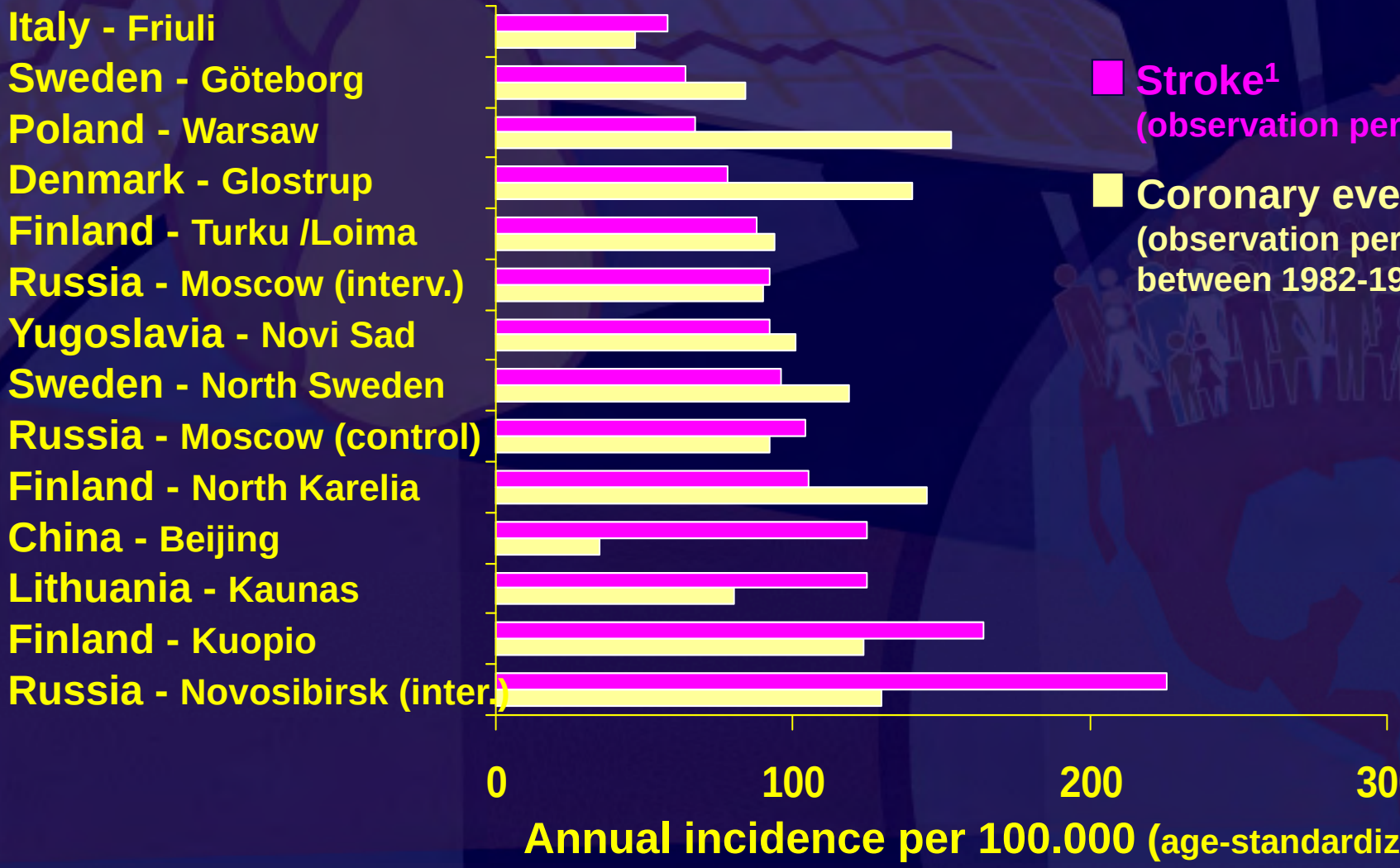
CHD Mortality in Countries Demonstrating Marked Variations



Yusuf: Circ, 2001

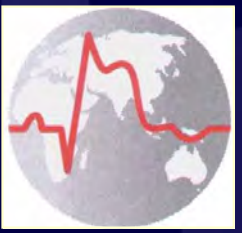
Incidence of Stroke and Coronary Events in 14 WHO MONICA Populations (women aged 35-64 years)

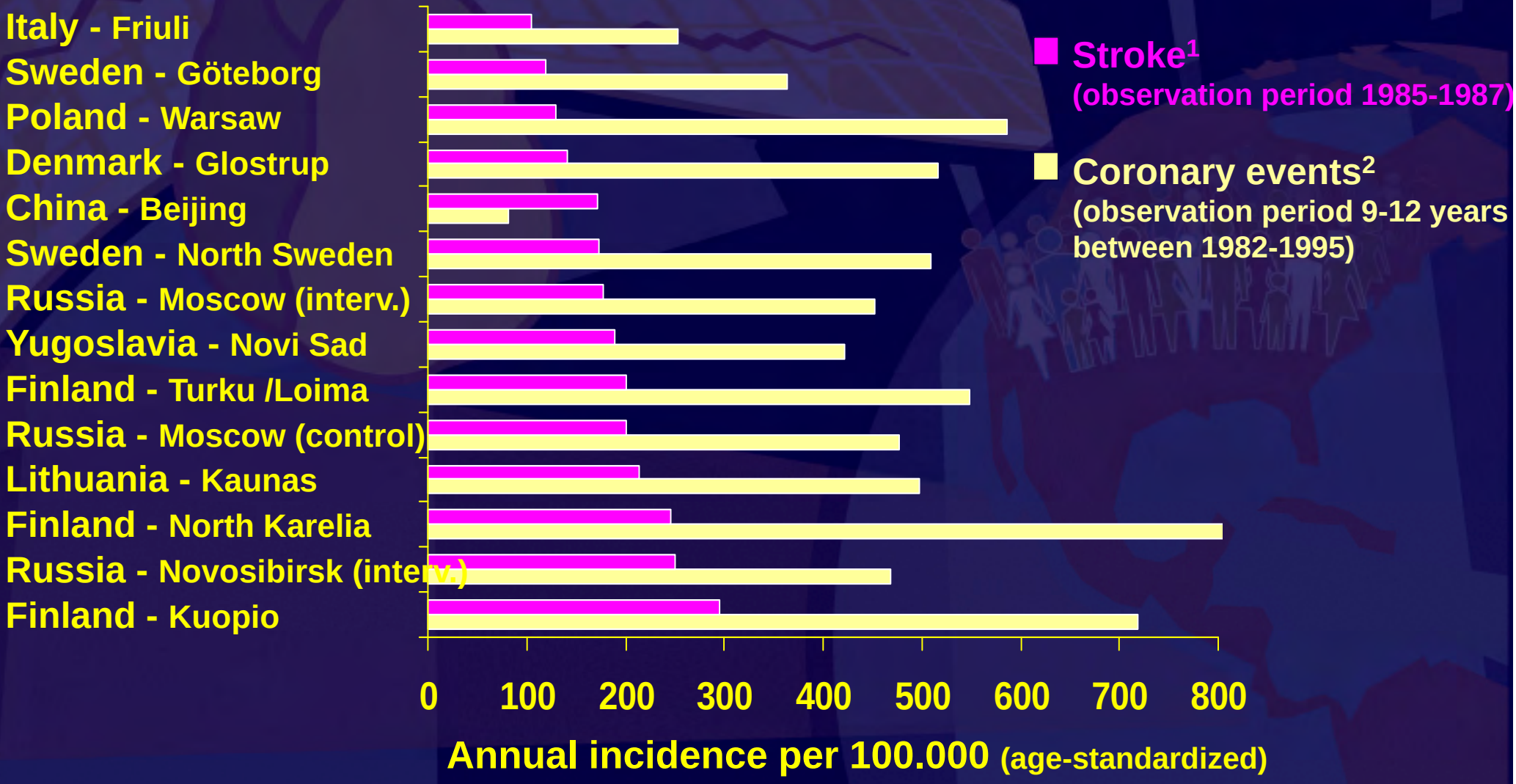




Sources: [1] P. Thorvaldsen et al. Stroke 1995, 26:361-367; [2] H. Tunstall-Pedoe et al. Lancet 1999, 353:1547-1557
http://www.chd-taskforce.de/slidekit/

Incidence of Stroke and Coronary Events in 14 WHO MONICA Populations (men aged 35-64 years)





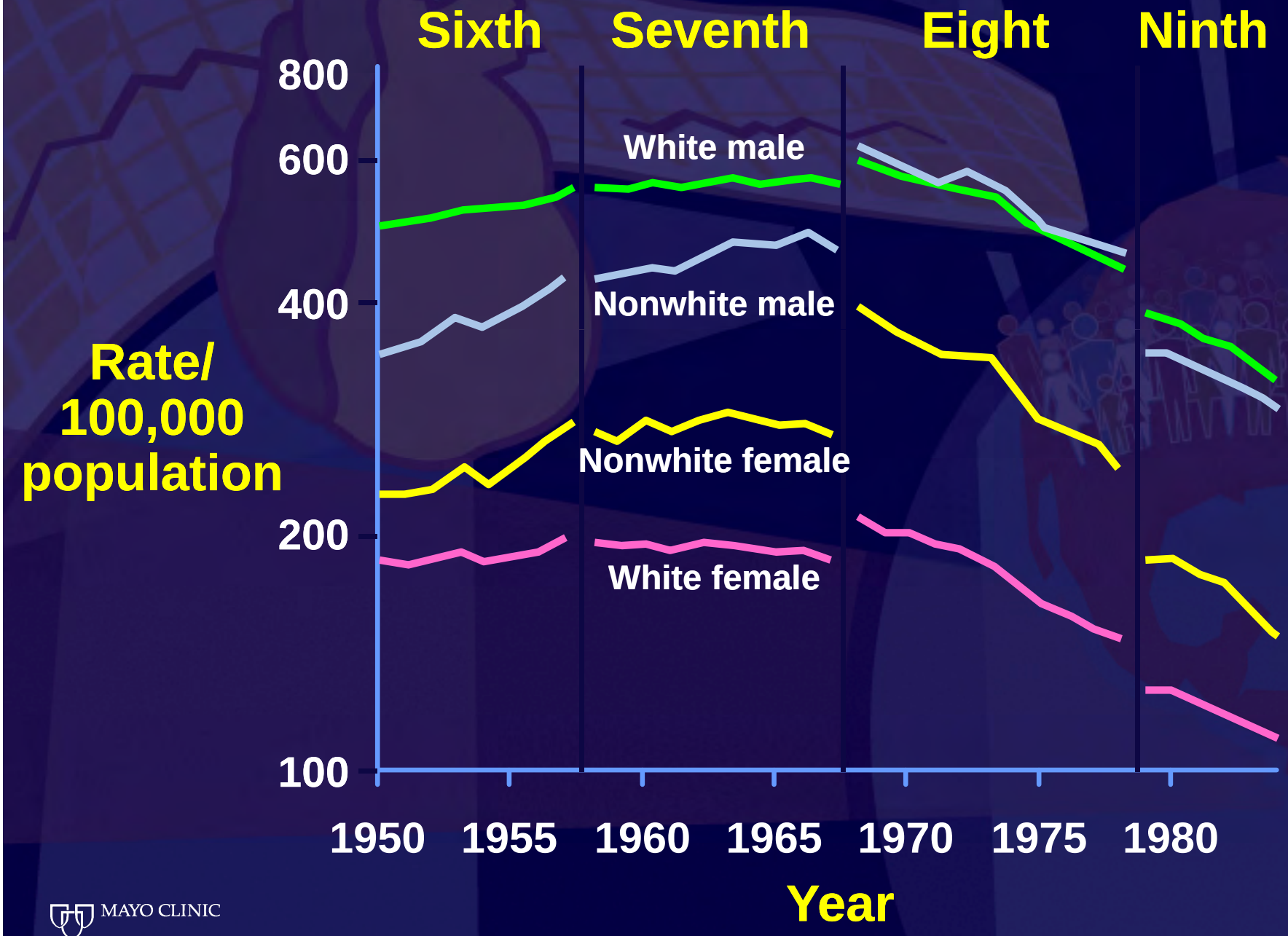
Sources: [1] P. Thorvaldsen et al. Stroke 1995, 26:361-367; [2] H. Tunstall-Pedoe et al. Lancet 1999, 353:1547-1557—
http://www.chd-taskforce.de/slidekit/

MAYO CLINIC

CHD deaths declined in middle-aged men Women and the elderly experienced less of a decline in CHD deaths

Deaths from Heart Disease

International Classification of Diseases



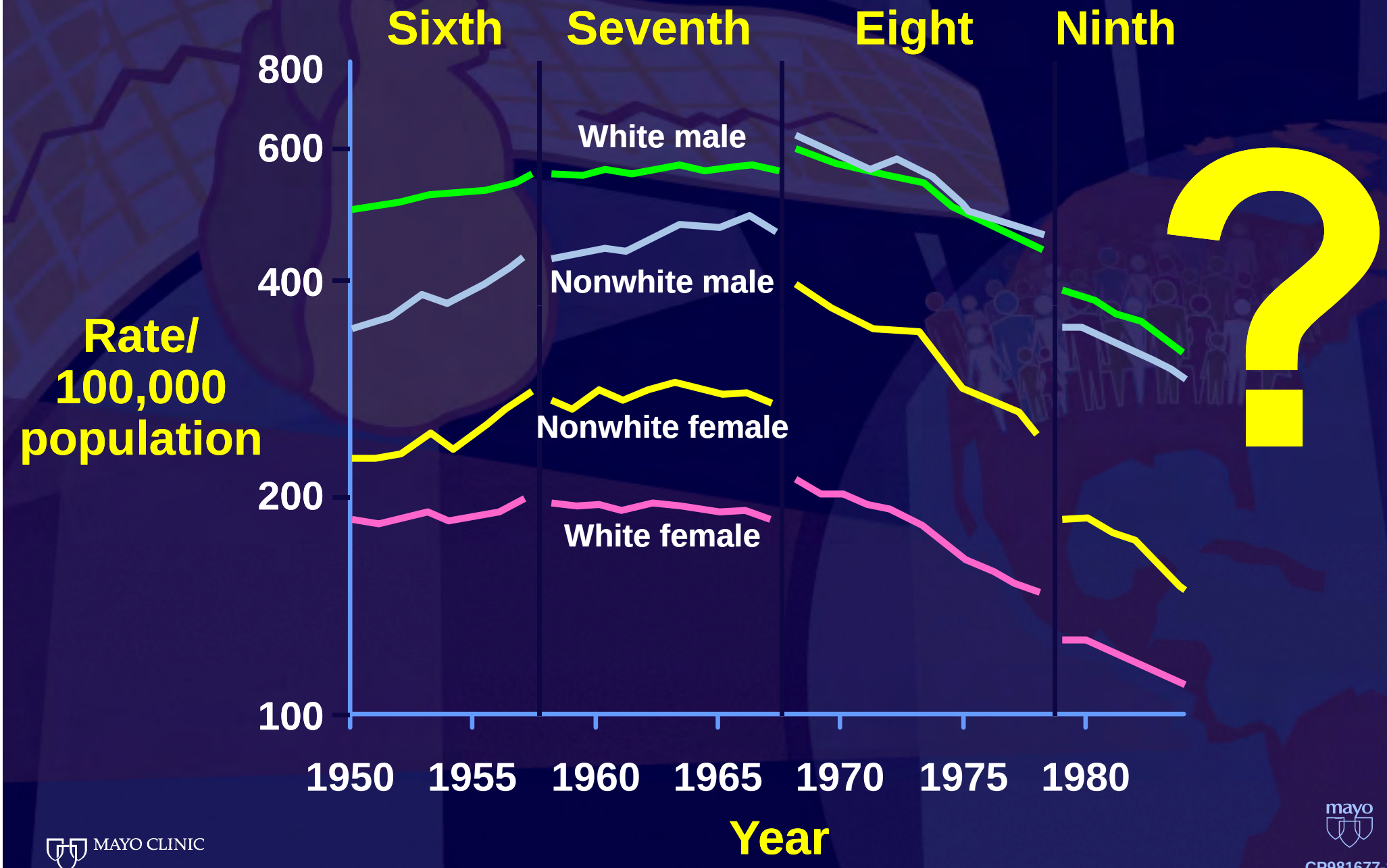
MAYO CLINIC

mayo

CP981677-1

Deaths from Heart Disease

International Classification of Diseases



MAYO CLINIC

mayo

CP981677-1

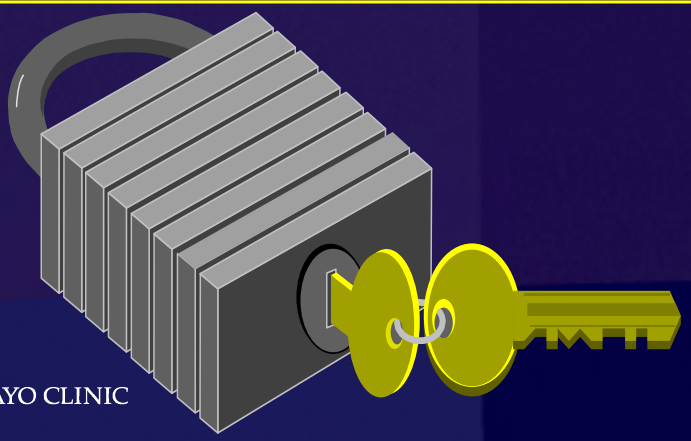
Decline in CHD deaths
Determinants

Incidence

Fatalities

Primary prevention

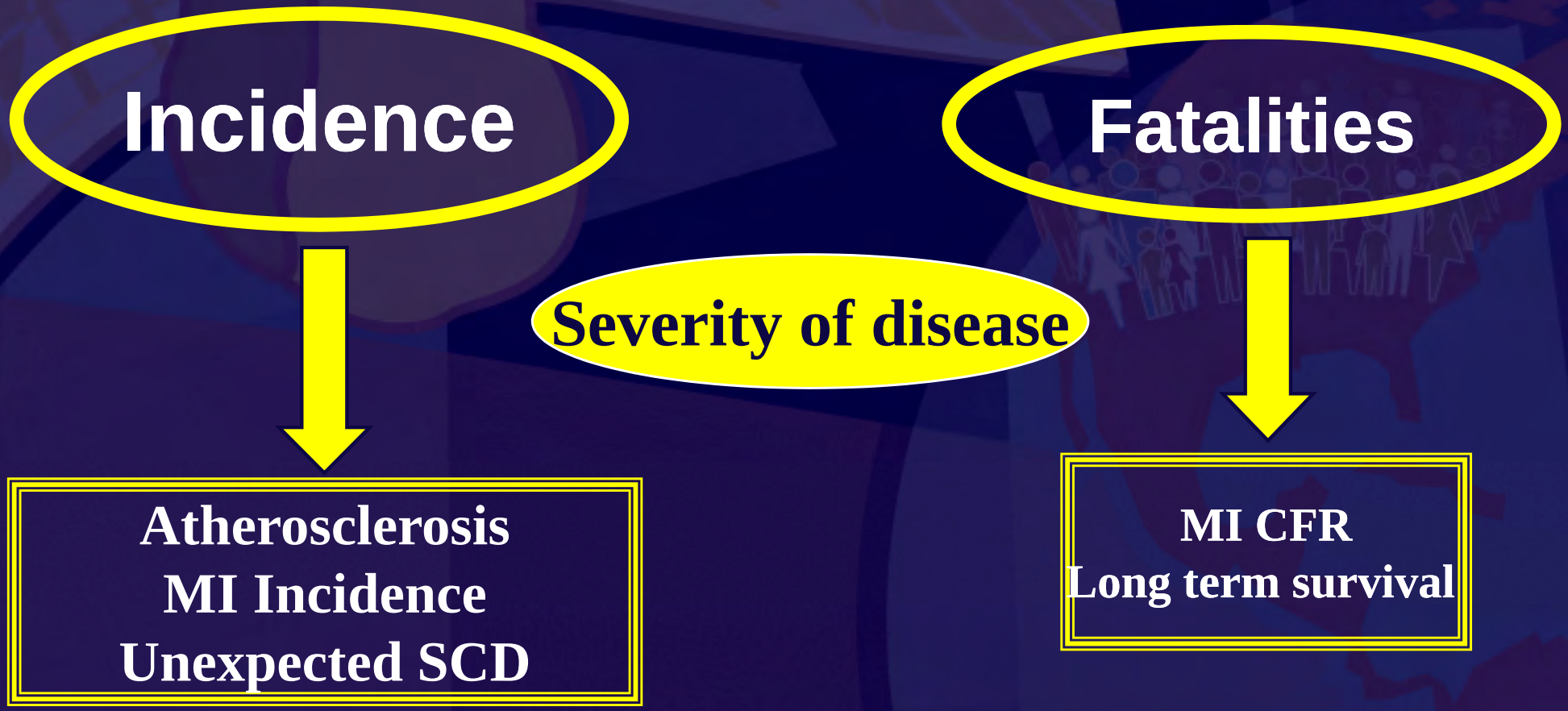
Medical care
Reperfusion Rx



Better prevention
Better care

MAYO CLINIC

Experimental approach



Decline in CHD deaths

Incidence ~

Fatalities ↓

MI Severity ↓

Primary prevention

Medical care

Shift of the burden of CHD towards women and the elderly

Post MI morbidity improving but remains high

Community surveillance

- **Defined** population
- **Rigorous** event definition
- **Constant** criteria over time

ARIC
Minnesota Heart Survey (MHS)
Worcester Heart Attack Study
Olmsted County Study

CHD incidence

Atherosclerosis and MI incidence declined among younger persons.

Burden of incident CHD displaced towards elderly and women.

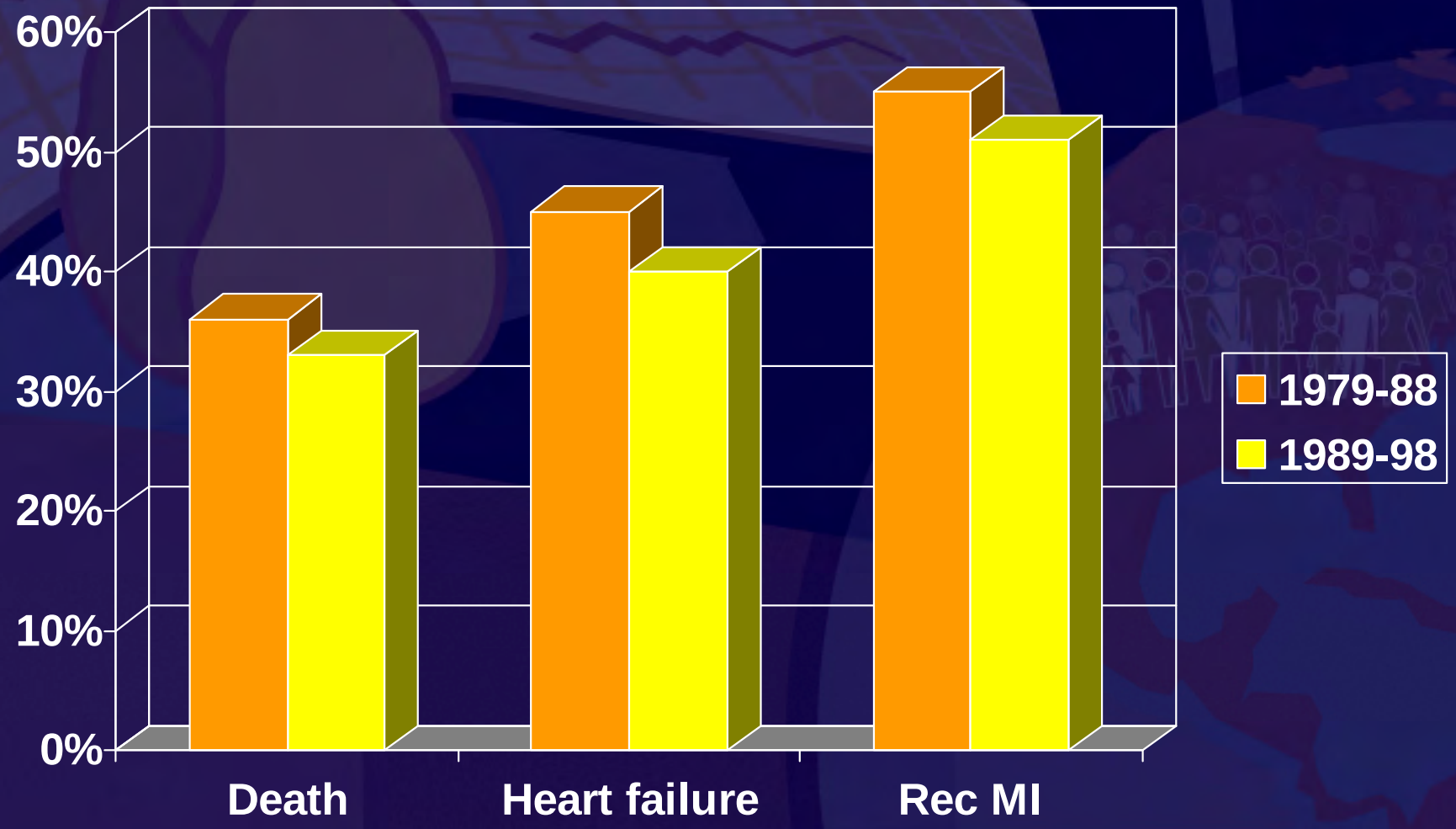
Why??

Death after MI
1994 vs 1979

	RR	95% CI
Age 40	0.45	0.22-0.90
Age 60	0.70	0.49-0.99
Age 80	1.08	0.83-1.35

Annals of Int Med, 2002

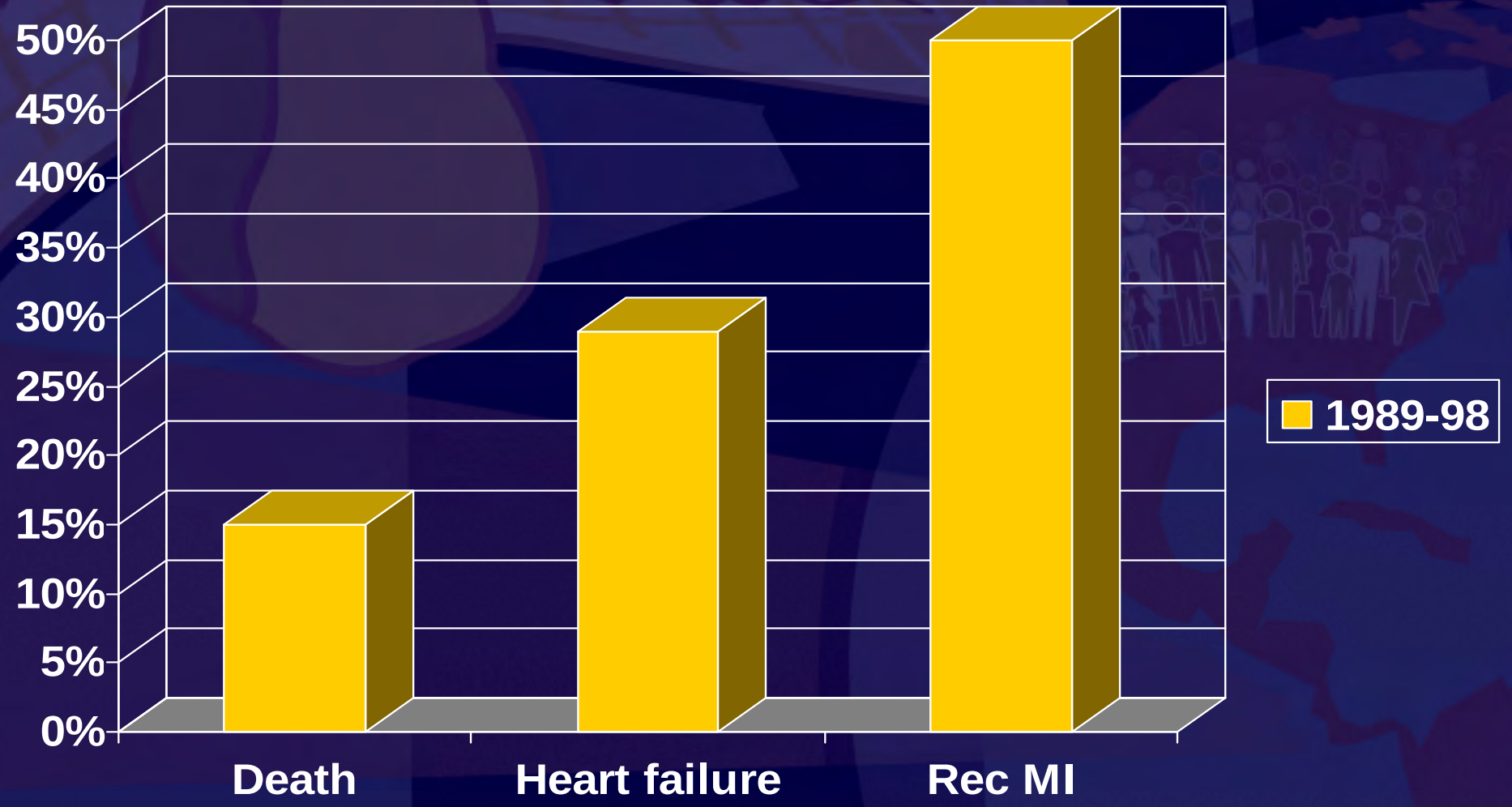
Events rates at 5 years
2171 incident MIs- Olmsted Co



Roger, Annals 2002---Hellermann, Am J Epi 2003---Jokhadar Am J Epi 2004

Events rates at 5 years

MIs with evidence-based therapy*



*Revascularization, Beta-blockers, Aspirin

MAYO CLINIC

Coronary Disease Trends

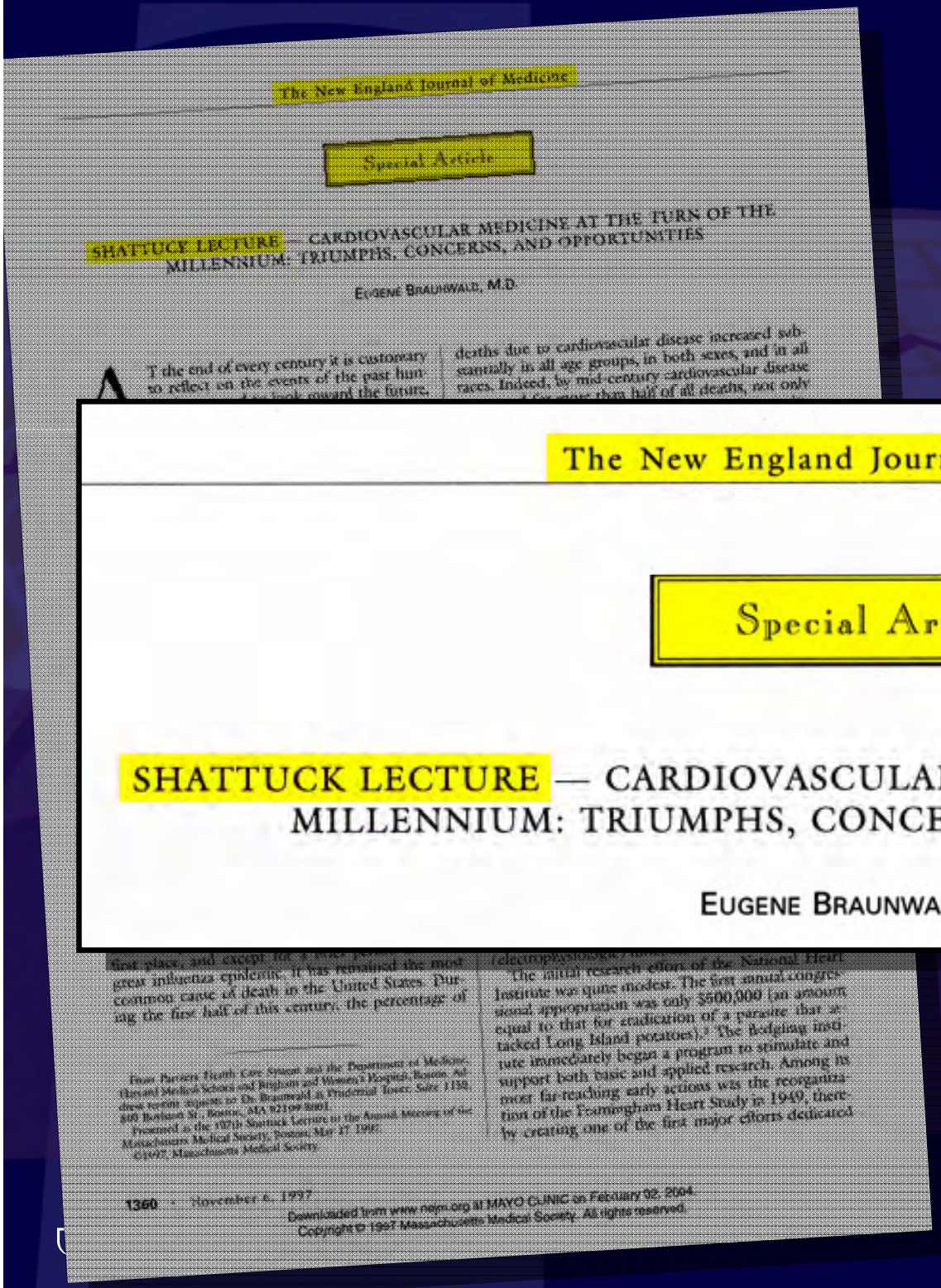
Implications for heart failure

While CHD mortality declined,

- MI incidence and atherosclerosis prevalence have failed to change
- BUT survival after MI is improving concurrently to the use of reperfusion therapy and the severity of MI is declining
- How are MI survivors contributing to the epidemic heart failure?

Emergence of New Epidemics of Cardiovascular Disease

Two new epidemics of cardiovascular disease are emerging: Heart failure and atrial fibrillation. Hospital admissions for heart failure have climbed steadily, so that this condition has become the single most frequent cause of hospitalization in persons 65 years of age and older.



The New England Journal of Medicine

Special Article

SHATTUCK LECTURE — CARDIOVASCULAR MEDICINE AT THE TURN OF THE MILLENNIUM: TRIUMPHS, CONCERNS, AND OPPORTUNITIES

EUGENE BRAUNWALD, M.D.

The New England Journal of Medicine

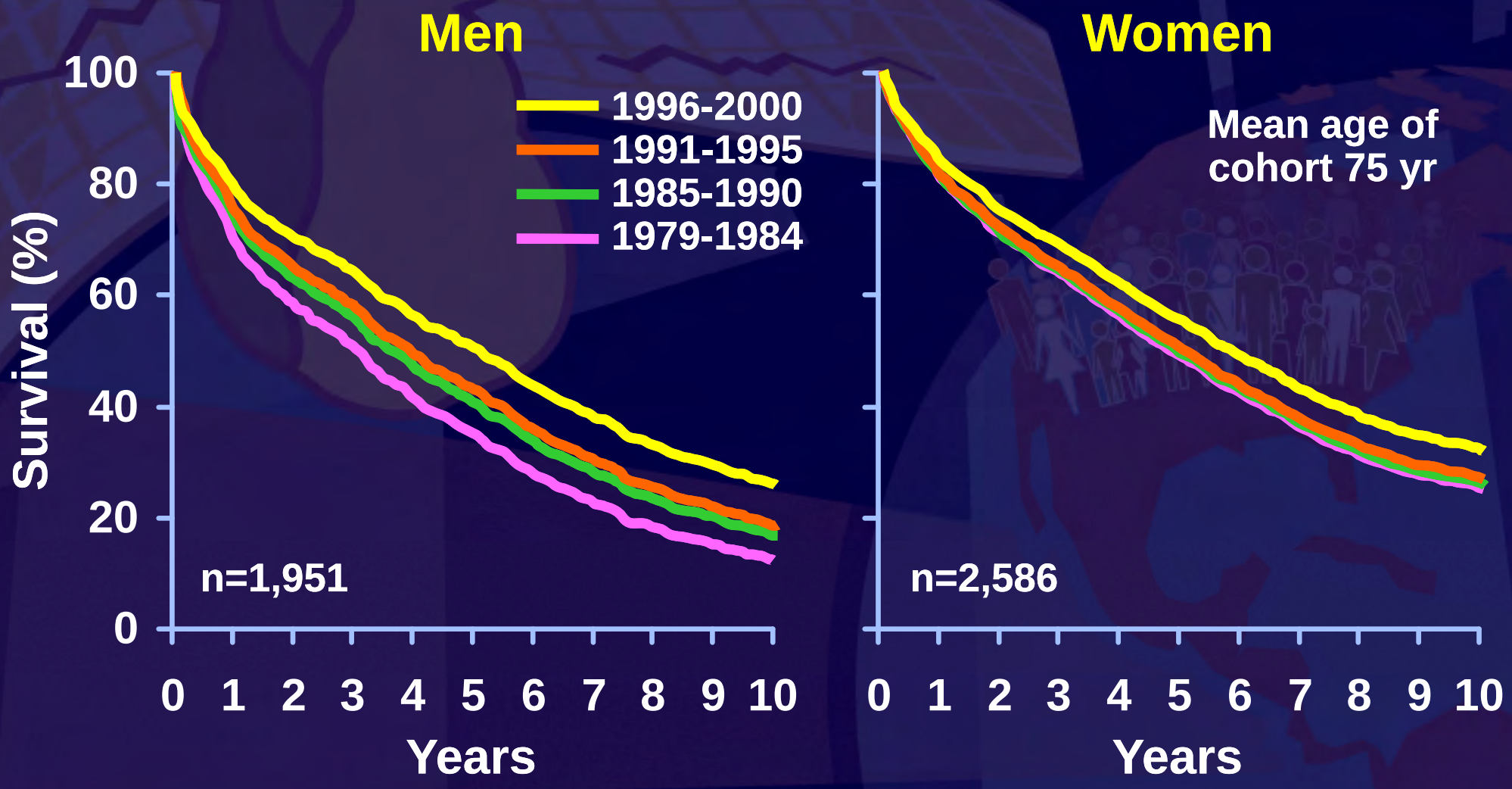
Special Article

SHATTUCK LECTURE — CARDIOVASCULAR MEDICINE AT THE TURN OF THE MILLENNIUM: TRIUMPHS, CONCERNS, AND OPPORTUNITIES

EUGENE BRAUNWALD, M.D.

Downloaded from www.nejm.org at MAYO CLINIC on February 02, 2004.
Copyright © 1997 Massachusetts Medical Society. All rights reserved.

Mortality After Diagnosis of Heart Failure
Olmsted County, MN

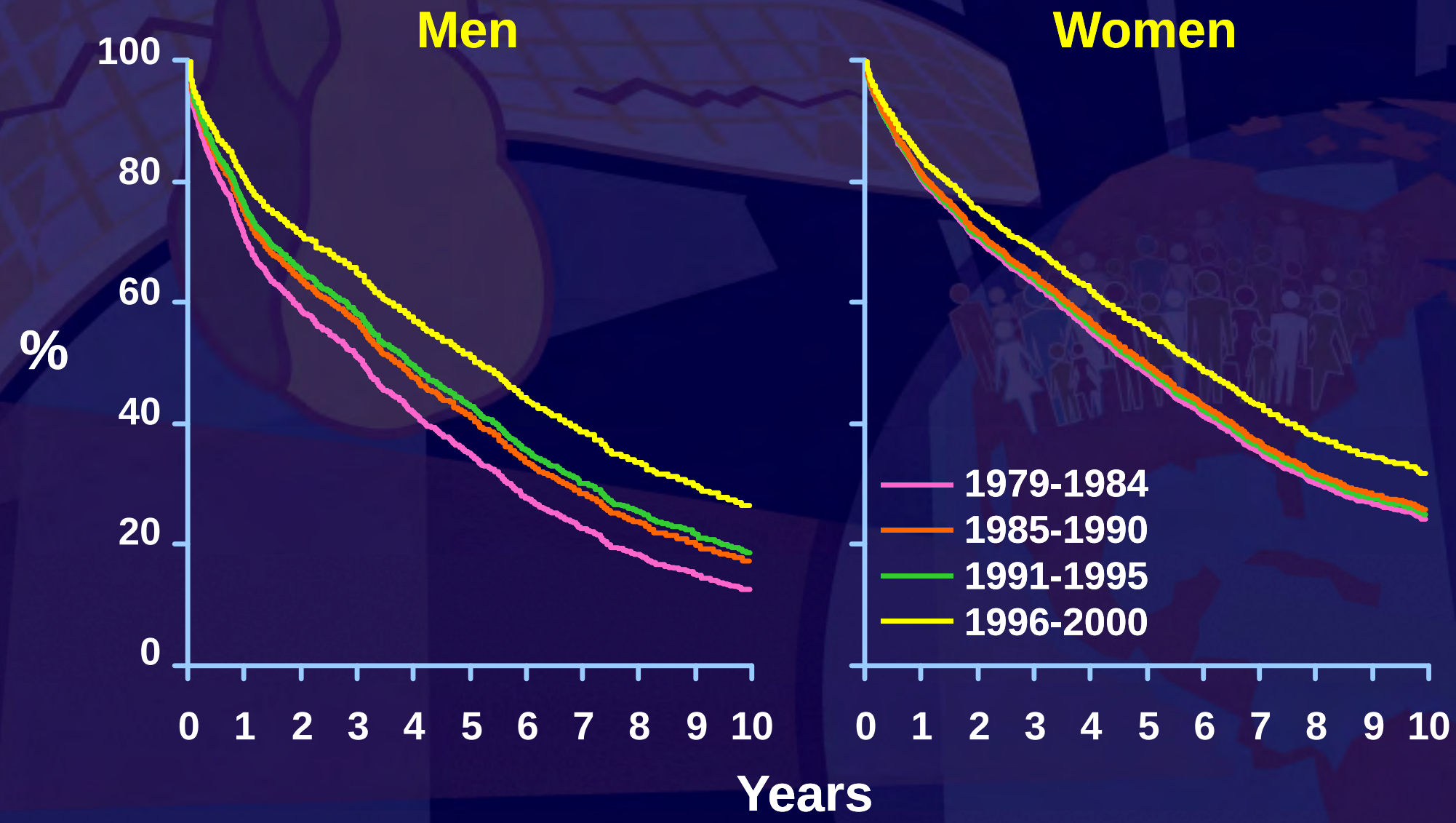


Roger et al: JAMA 292:344, 2004

MAYO CLINIC

CP1159959-2

Temporal Trends in Mortality After Diagnosis of Heart Failure by Sex



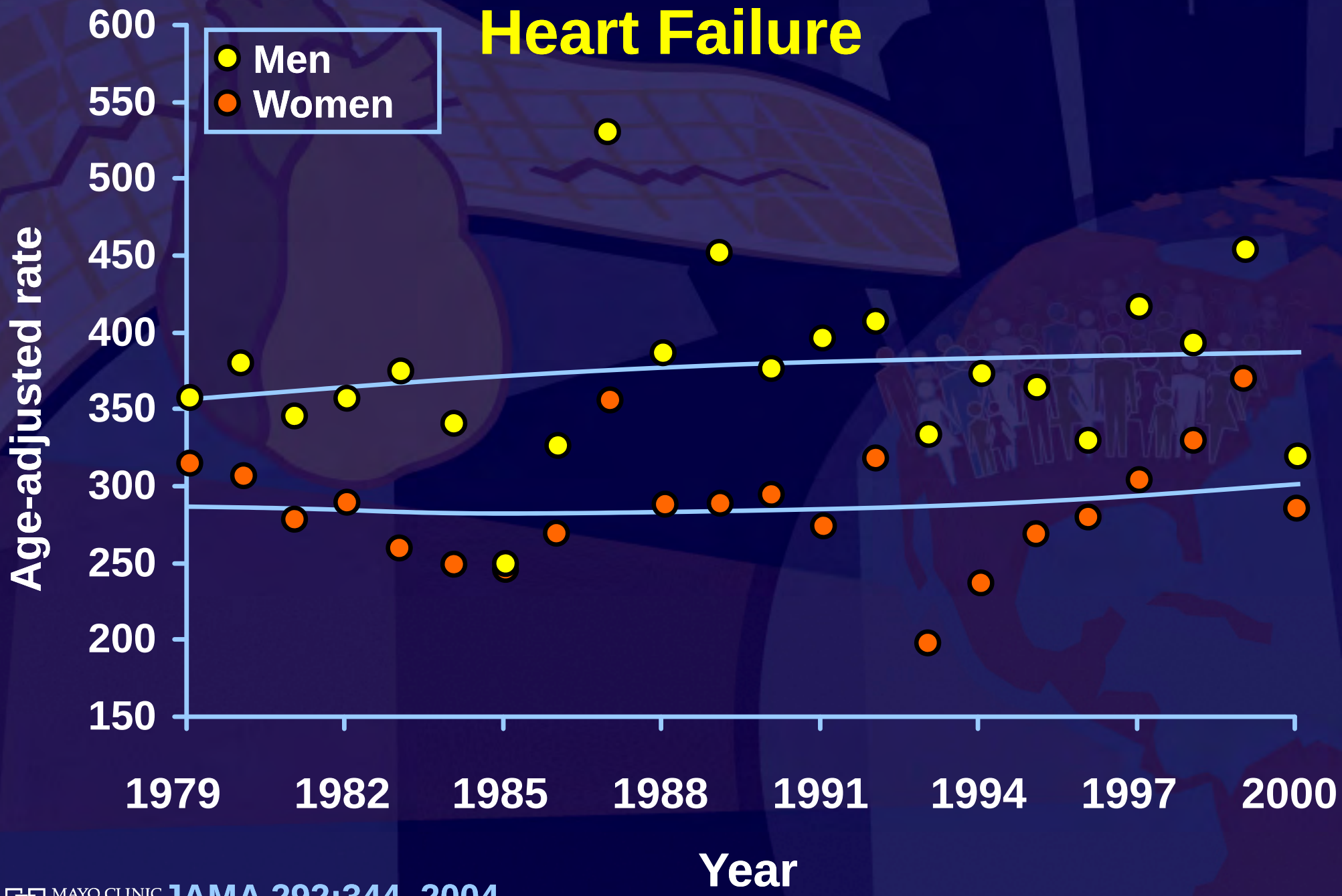
Curves represent 5-yr survival for 75 year olds

MAYO CLINIC

JAMA 292:344, 2004

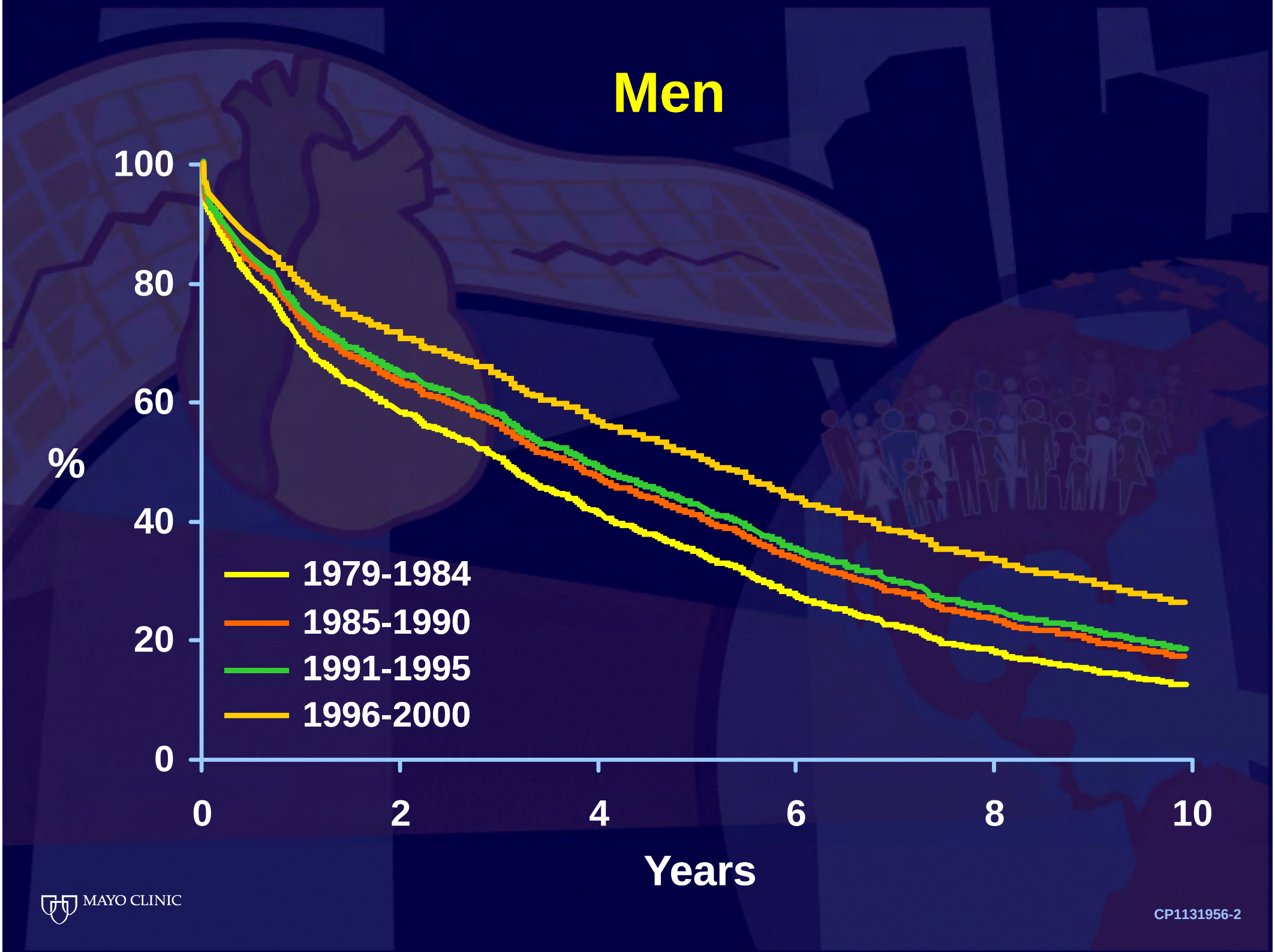
CP1142561-5

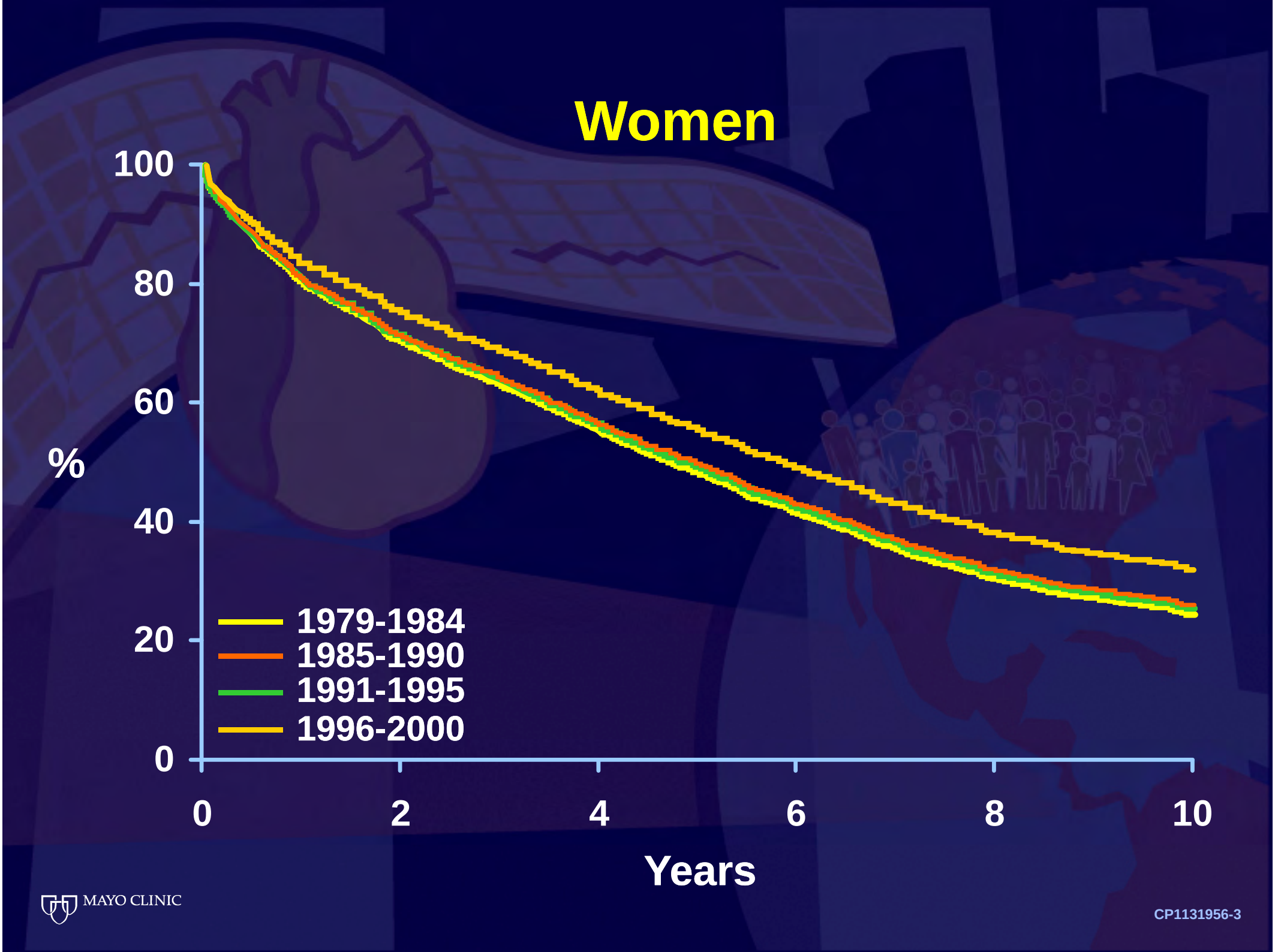
Temporal Trends in Age-Adjusted Incidence of Heart Failure



MAYO CLINIC JAMA 292:344, 2004

CP1131956-1


Men
100
80
60
40
20
0
%
1979-1984
1985-1990
1991-1995
1996-2000
0
2
4
6
8
10
Years
MAYO CLINIC
CP1131956-2


Women
100
80
60
%
40
20
0
1979-1984
1985-1990
1991-1995
1996-2000
0
2
4
6
8
10
Years
MAYO CLINIC
CP1131956-3

Conclusions

Over the past 2 decades, in the community

- **MI trends:** incidence stable and outcomes improving (although not enough)
- **HF trends:** incidence stable and survival improving, leading to more hospital admissions
    - The mortality of heart failure remains quite high, improved less among women and the elderly
- The HF epidemic is fueled largely by hospital admissions
- Coronary disease trends do not fully explain HF trends, work needed to understand determinants of HF in the population
- Adverse trends in obesity, diabetes and hypertension likely play a role and delineate preventive opportunities
- Urgent need for the study of diverse populations

Heart deaths drop

Experts credit healthier lifestyles, technological advances

Associated Press

MINNEAPOLIS — Heart disease, the leading cause of death in Minnesota an elsewhere for almost a century, has sl below cancer as the state's leading k

Experts say it means that the sta ning the war on heart disease, n battle against cancer.

For the first time, cancer to spot in Minnesota in 2000, w people died of cancer (9,21 disease (8,885), according certificates.

The shift went almo state officials starte major cancer strat in Bloomington.

"I took anoth 2000 and said an epidemio Health Dep disease a were rel plan to confe

to

American Heart Association. "It's quite extraordinary to see an epidemic ... in retreat. And people are living longer."

Experts say far more people are surviving or preventing heart attacks today because of healthier lifestyles and major advances in drugs and medical technology.

Minnesota's death rate from heart disease has dropped 40 percent since 1988 to one of the lowest rates in the nation. Luepker and others say lower smoking rates, better access to health care and more emphasis on controlling high blood pressure, cholesterol and other risk factors could be the reasons.

"Maybe it's better treatment. ... Maybe it's the activity level," said Dr. Robert Bonow, past president of the American Heart Association and chief of cardiology at Northwestern University's Feinberg School of Medicine in Chicago.

He said, however, that the news is somewhat misleading. The comparisons don't include deaths from stroke, which is linked to heart disease.

www.cancerplanmn.org.

It's quite extraordinary to see an epidemic…in retreat.

Rochester Post Bulletin, Sept 30, 2003

Heart deaths drop

Experts credit healthier lifestyles, technological advances

Associated Press

MINNEAPOLIS — Heart disease, the leading cause of death in Minnesota and elsewhere for almost a century, has slip below cancer as the state's leading kil

Experts say it means that the state ning the war on heart disease, not l battle against cancer.

For the first time, cancer took spot in Minnesota in 2000, whe people died of cancer (9,215) disease (8,885), according to certificates.

The shift went almost state officials started a major cancer strategy in Bloomington.

"I took another l 2000 and said, 'W an epidemiologi Health Depart disease again were releas plan to an conferen

"Tho tory," of M nat A

Experts say far more people are surviving or preventing heart attacks today because of healthier lifestyles and major advances in drugs and medical technology.

Minnesota's death rate from heart disease has dropped 40 percent since 1988 to one of the lowest rates in the nation. Luepker and others say lower smoking rates, better access to health care and more emphasis on controlling high blood pressure, cholesterol and other risk factors could be the reasons.

"Maybe it's better treatment. ... Maybe it's the activity level," said Dr. Robert Bonow, past president of the American Heart Association and chief of cardiology at Northwestern University's Feinberg School of Medicine in Chicago.

He said, however, that the news is somewhat misleading. The comparisons don't include deaths from stroke, which is linked to heart disease.

www.cancerplanmn.org.

Experts say far more people are surviving or preventing heart attacks today because of healthier lifestyles and advances in drug and medical technology.

Rochester Post Bulletin, Sept 30, 2003

. . .

THE WALL STREET JOURNAL WEDNESDAY, NOVEMBER 13, 1996

Heart Disease May Actually Be Rising

Researchers Claim Deaths Are Now Being Delayed To a Later Age Group

By JERRY E. BISHOP
Staff Reporter of THE WALL STREET JOURNAL

NEW ORLEANS – Americans have been seriously misled into thinking that heart disease is on the decline, the new president of the American Heart Association charged.

Deaths from heart disease haven't dropped nearly as much as health officials have claimed and the prevalence of the disease actually may be increasing, asserted President Jan L. Breslow, a Rockefeller University researcher, at the heart group's annual meeting here.

older chart showed the so-called age-adjusted death rate reflecting the death rate for each age group in the population. The older chart is based on the U.S. population in 1940, when the proportion of Americans over age 65 was relatively small.

Thus, the older chart gives heavy weight to a decline in heart-disease deaths among 40-to-60 year-olds. But it gives very little weight to increases in the death rates among the older groups where most heart-disease deaths are occurring, the researchers said.

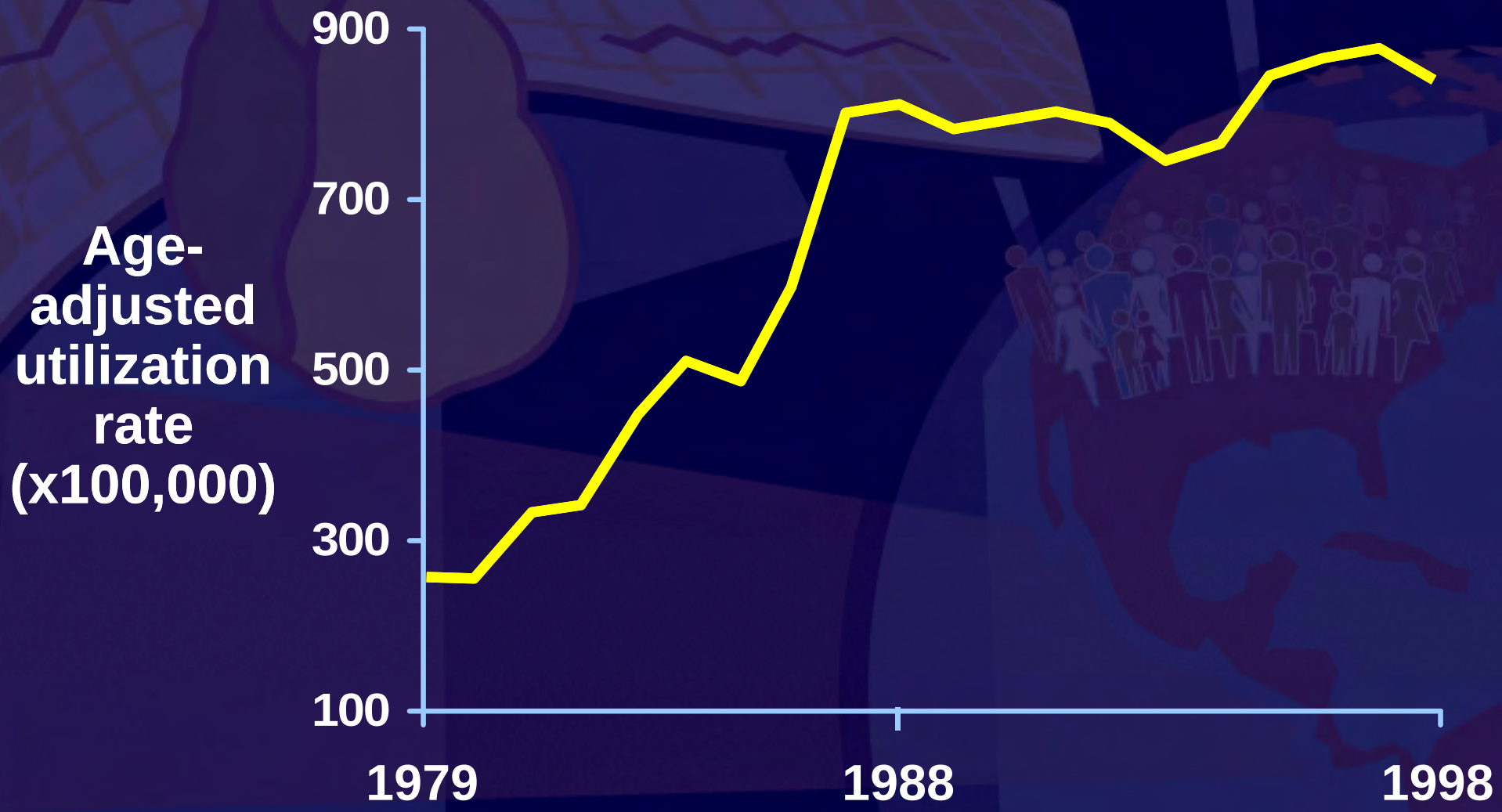
The researchers said that deaths from heart disease, instead of declining, are only being postponed to later ages. This postponement is the real result of the efforts by Americans to reduce their risk of heart disease with low-fat diets, quitting smoking, blood-pressure control and weight loss. Improved care of people who have heart attacks also has helped push deaths to a later age.

"The actual overall number of cardiovascular deaths is 60% higher than it was 30 years ago, despite a 60% decline in the age-adjusted death rate," added Australian cardiologist David Kelly of the University of Sydney. Today, "80% of coronary deaths are in the over-65 group," Dr. Kelly said.

Dr. Kelly said that when the "baby boom" population begins to move into the over-65 age group, in about 2010, "they'll have a high incidence of coronary heart disease and there's going to be a huge increase in the need for medical care."

Dr. Breslow said the strategy of pointing to successes against heart disease to coax more money for research, "although plausible as a strategy, . . . has backfired." The proportion of funds from of the National Institutes of Health going to heart and vascular disease has dropped by 5% to $669 million since 1985.

Age-Adjusted Angiography Utilization Rates

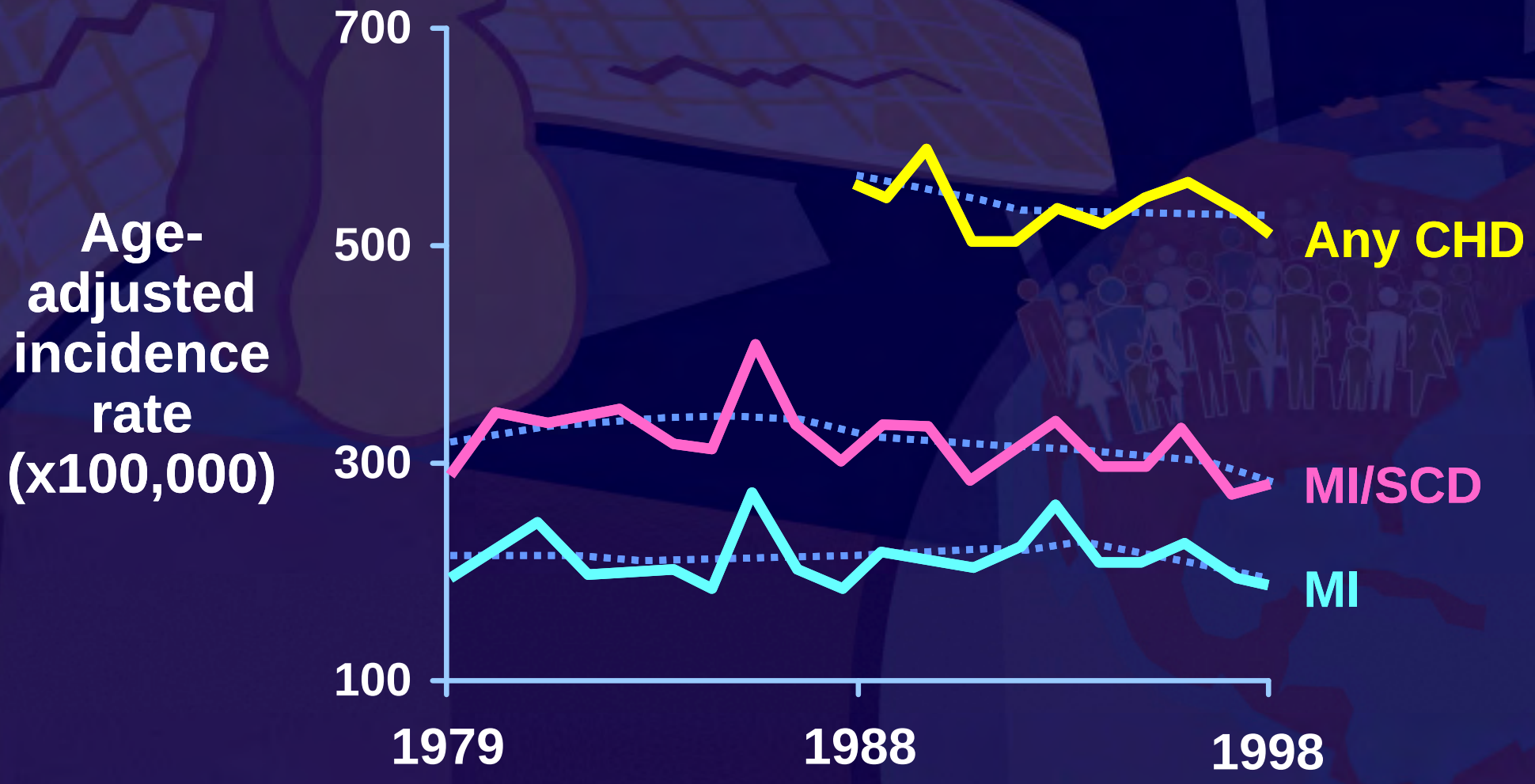


MAYO CLINIC

Arciero, AJM 2004

CB079700-2

Age-Adjusted Incidence Rates

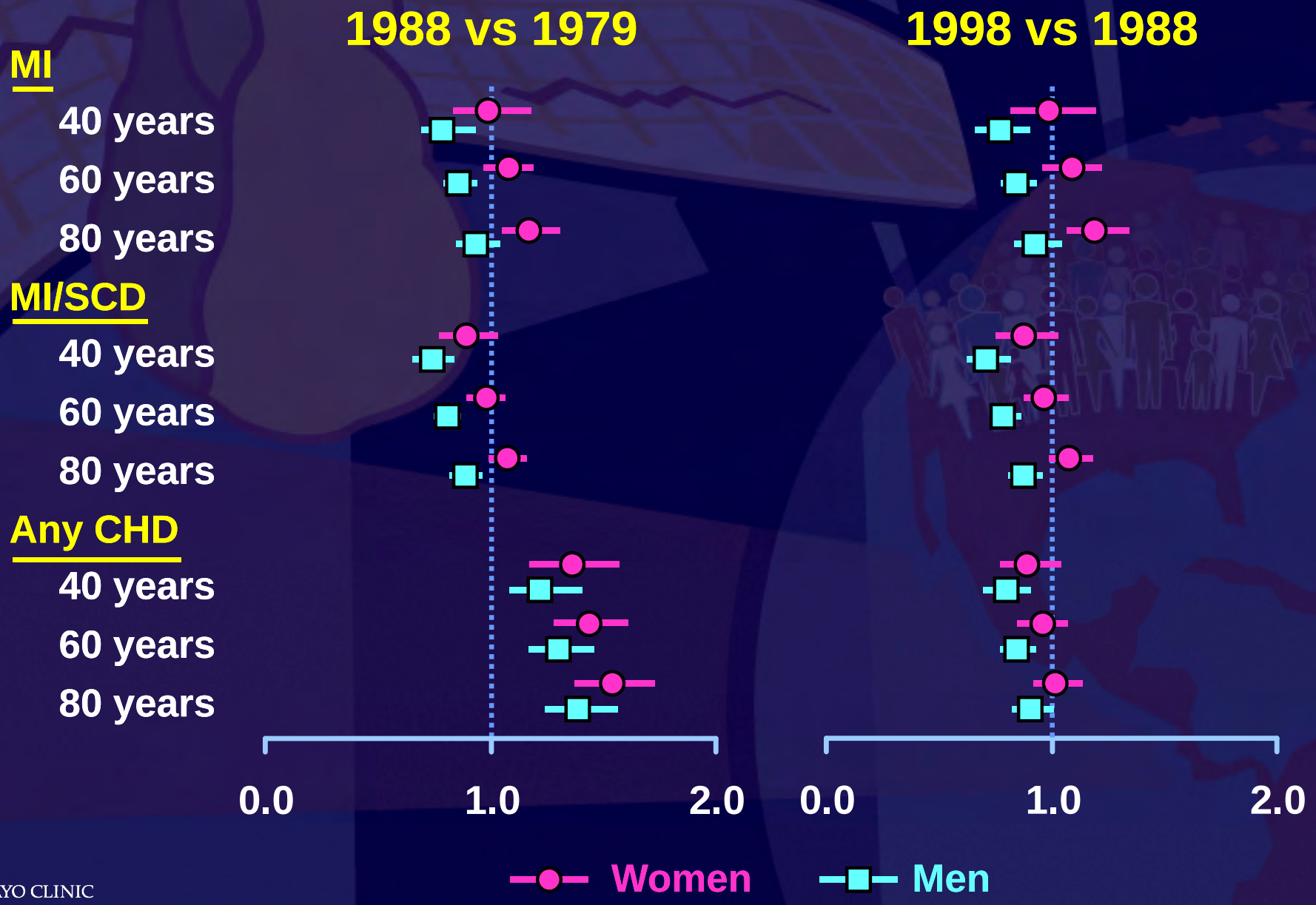


MAYO CLINIC

Arciero, AJM 2004

CB079700-3

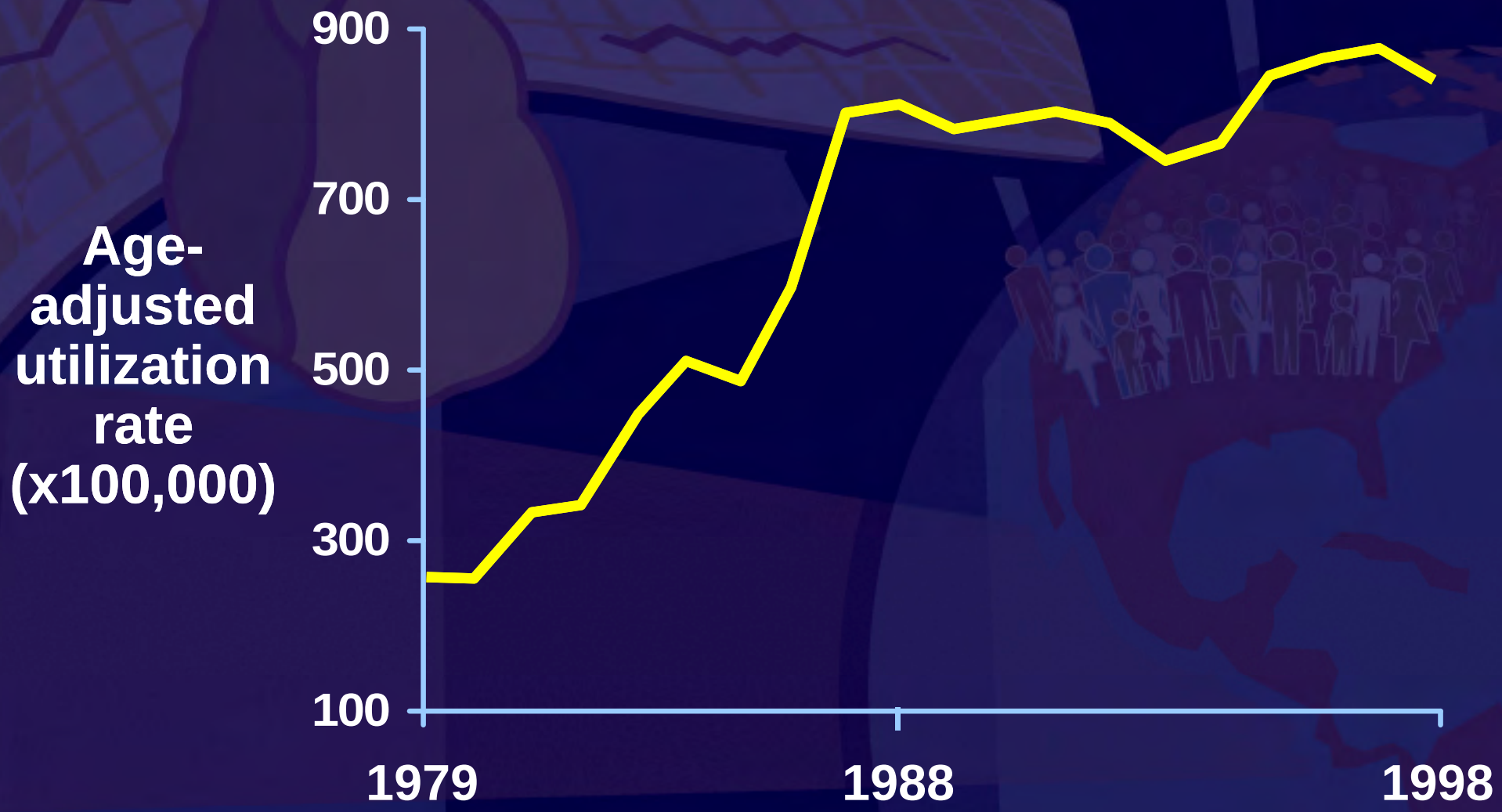
Age- and Sex-Specific Relative Risks for Incident CHD



Arciero, AJM 2004

MAYO CLINIC
CB079700-1

Age-Adjusted Angiography Utilization Rates

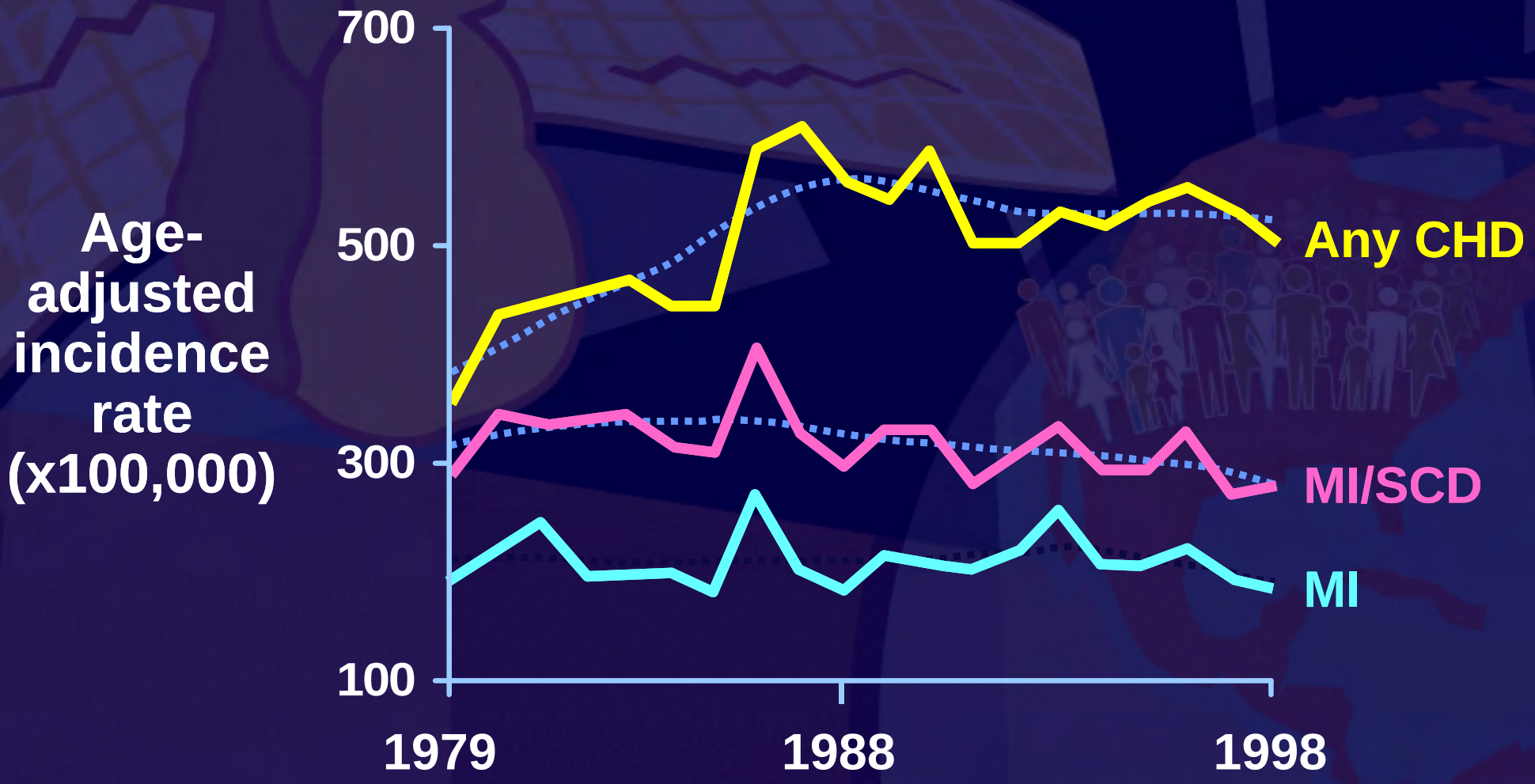


MAYO CLINIC

Arciero, AJM 2004

CB079700-2

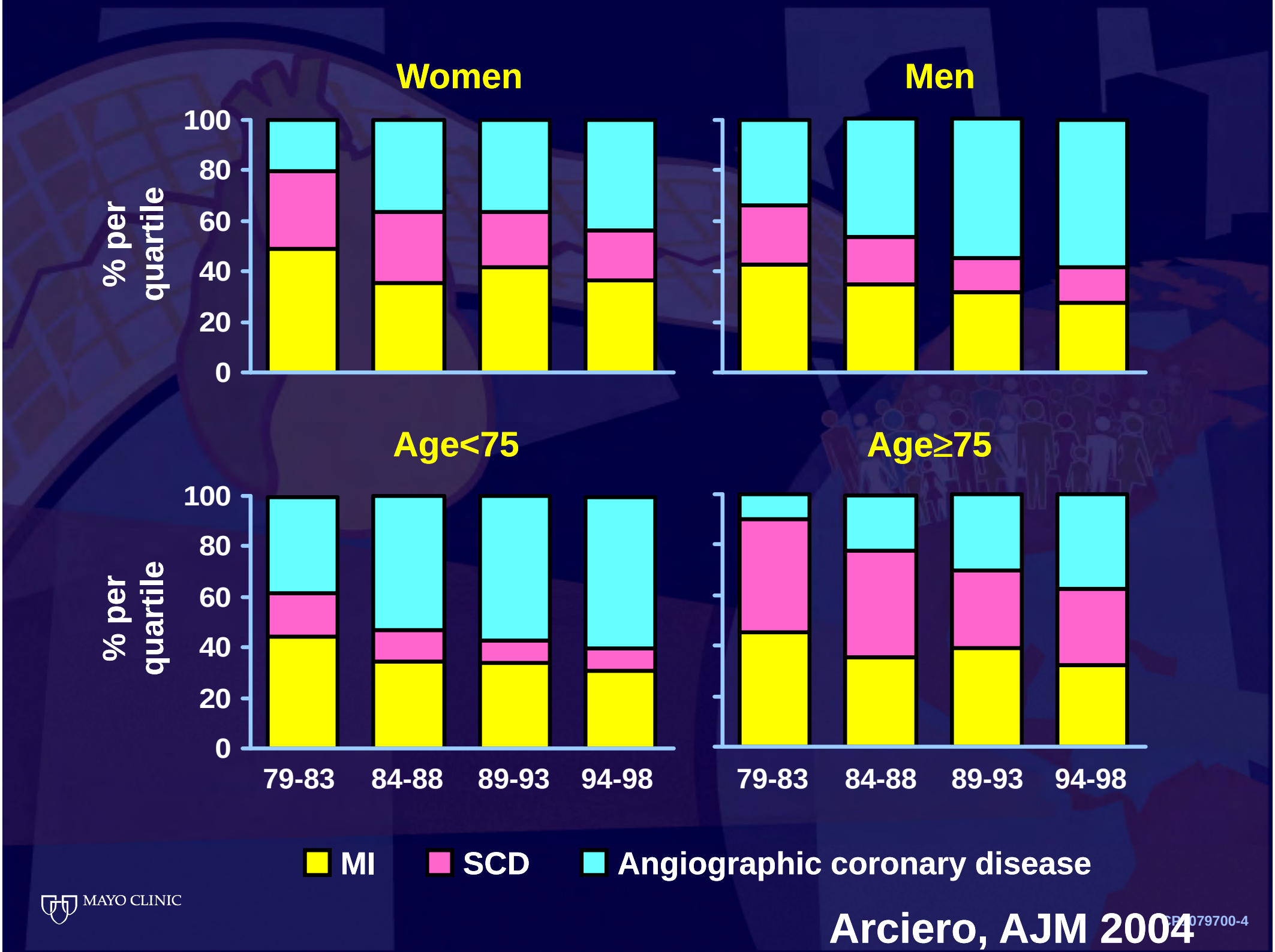
Age-Adjusted Incidence Rates



MAYO CLINIC

Arciero, AJM 2004

CB079700-3



MAYO CLINIC

Arciero, AJM 2004

CB079700-4

Trends in CV Disease

Epidemiology: Occurrence of Dx according to time, place, person

Issues

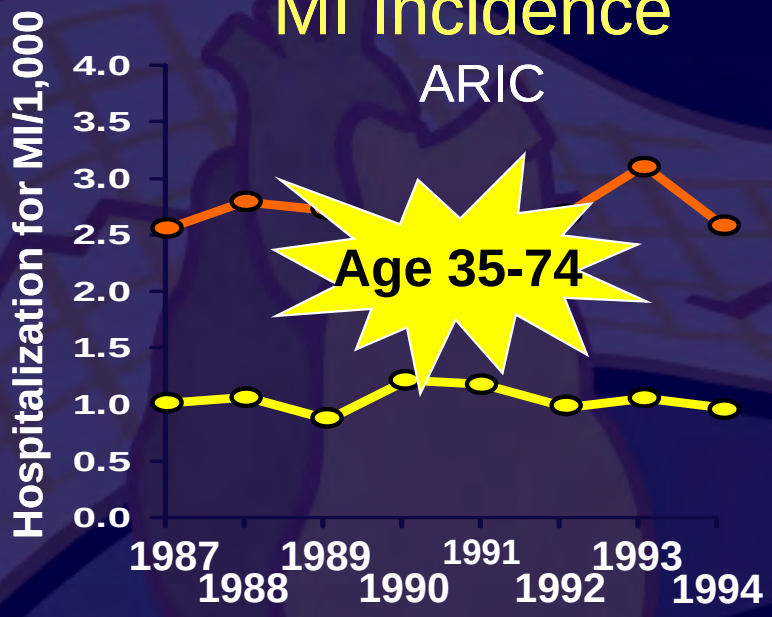
What is a trend?

What components of trends can we measure?

What are the weaknesses/strengths of data?

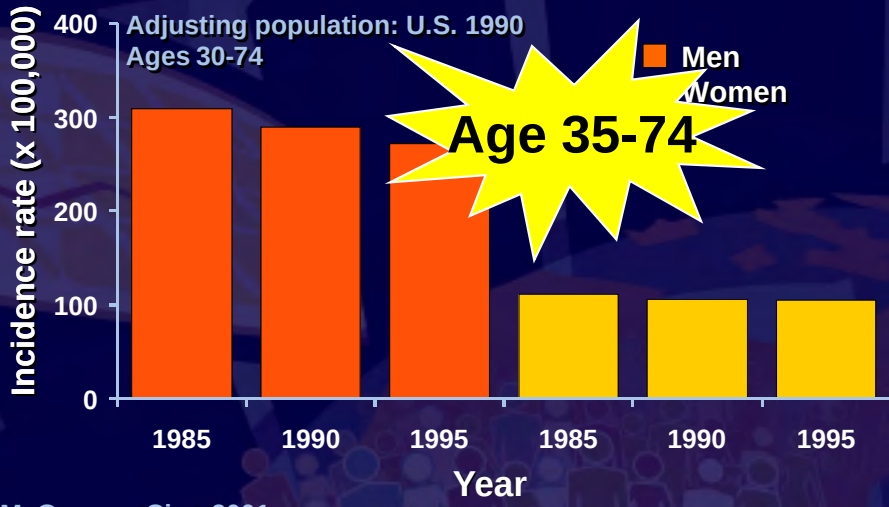
What period, population or location is of interest and why?

MI Incidence
ARIC



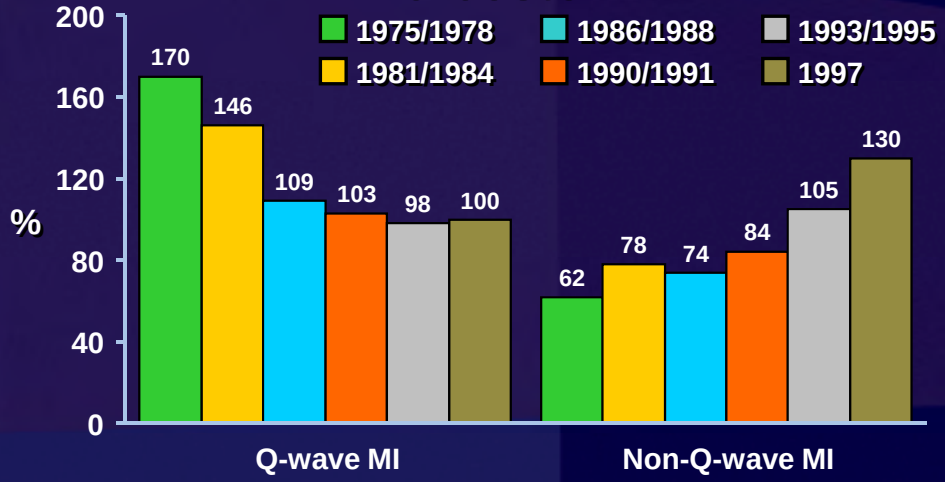
Rosamond, NEJM 1998

Acute CHD
MN Heart Survey



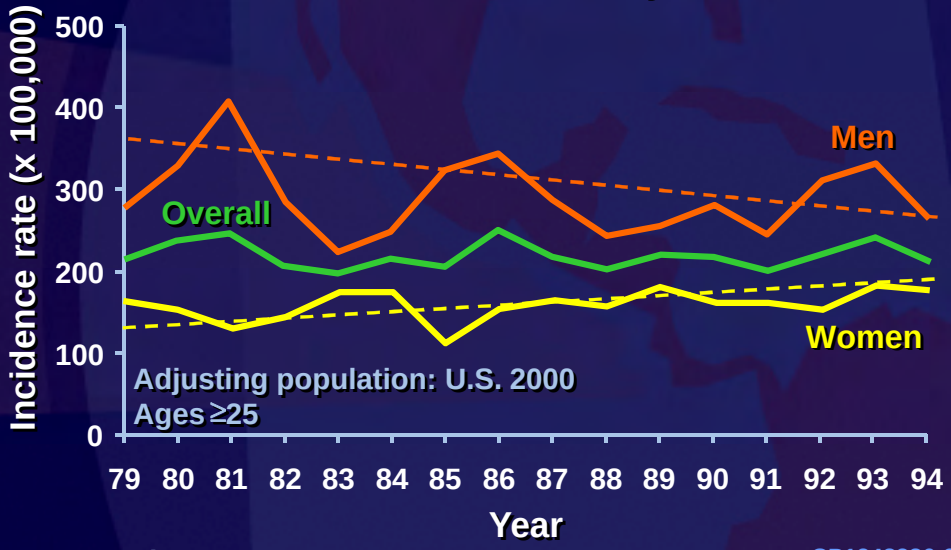
McGovern: Circ, 2001

MI Incidence
Worcester



Furman et al: JACC, 2001

MI Incidence
Olmsted County



Ann Int Med, 2002

MAYO CLINIC

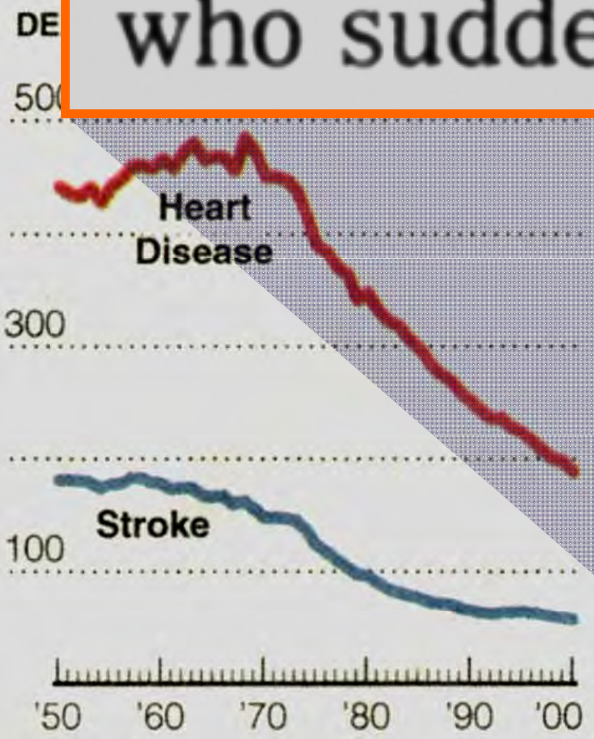
CP1348386-9

Emergence of New Epidemics of Cardiovascular Disease

Two new epidemics of cardiovascular disease are emerging: Heart failure and atrial fibrillation. Hospital admissions for heart failure have climbed steadily, so that this condition has become the single most frequent cause of hospitalization in persons 65 years of age and older.

Go

The stereotypical heart attack patient is no longer a man in his 50's who suddenly falls dead.



Source: National Institutes of Health

The New York Times

down for decades, but only lately have doctors begun to appreciate how profoundly things have changed for heart attacks and strokes.

They remain the leading cause of death in the United States, but their toll is nothing like what it used to be. They kill proportionately fewer people and — in another major change — they strike far later in life. Despite the obesity epidemic, the trends are continuing with no end in sight.

The stereotypical heart attack patient is no longer a man in his 50's who suddenly falls dead.

"That death rate is so low now that we're no longer able to track it," said Dr. Teri Manolio, director of the epidemiology and biometry programs

May 2003

Shift of the burden of MI towards

- Elderly
- Women
- Non Caucasians


I'M SENDING CHESTERFIELDS to
That's the merriest Christmas any smo
Chesterfield mildness plus no unpleas
Rona
see RONALD REAGAN
CHESTERFIELD


VIRGINIA SLIMS

Gender differences in cardiac care

The Yentl Syndrome

OUTRAGEOU PRACTICE

The Alarming Truth abo How Medicine Mistreats W

Leslie Laurence and Beth Wein

Heart disease is the #1 killer of women.

No one knows what it's like to be you

Except us

WomenHeart

the National Coalition for Women with Heart Disease

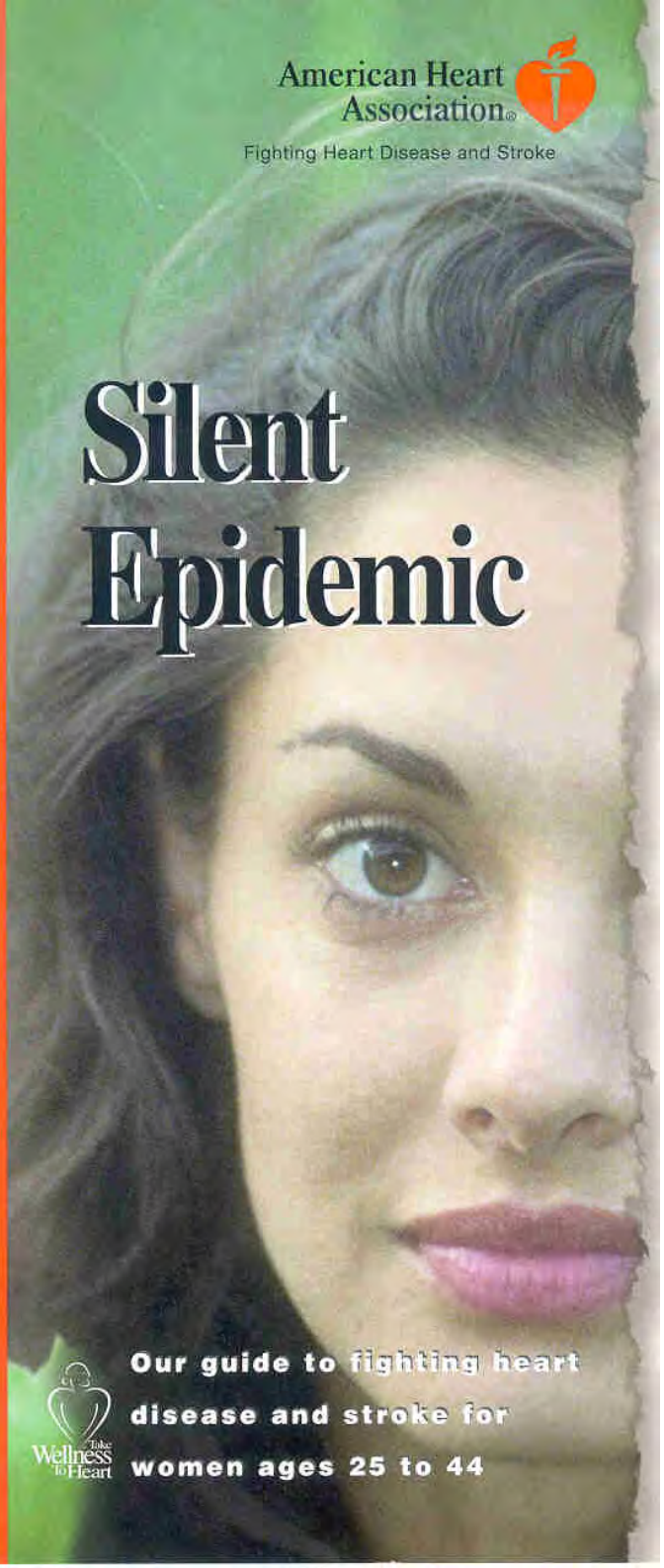
Heart attacks strike nearly 500,000 women each year. Almost half die from them.

WomenHeart is the only national organization found by women with heart disea dedicated to reducing deat and disability among the 8,000,000 American wome living with heart disease.

American Heart Association®

Fighting Heart Disease and Stroke

Silent Epidemic

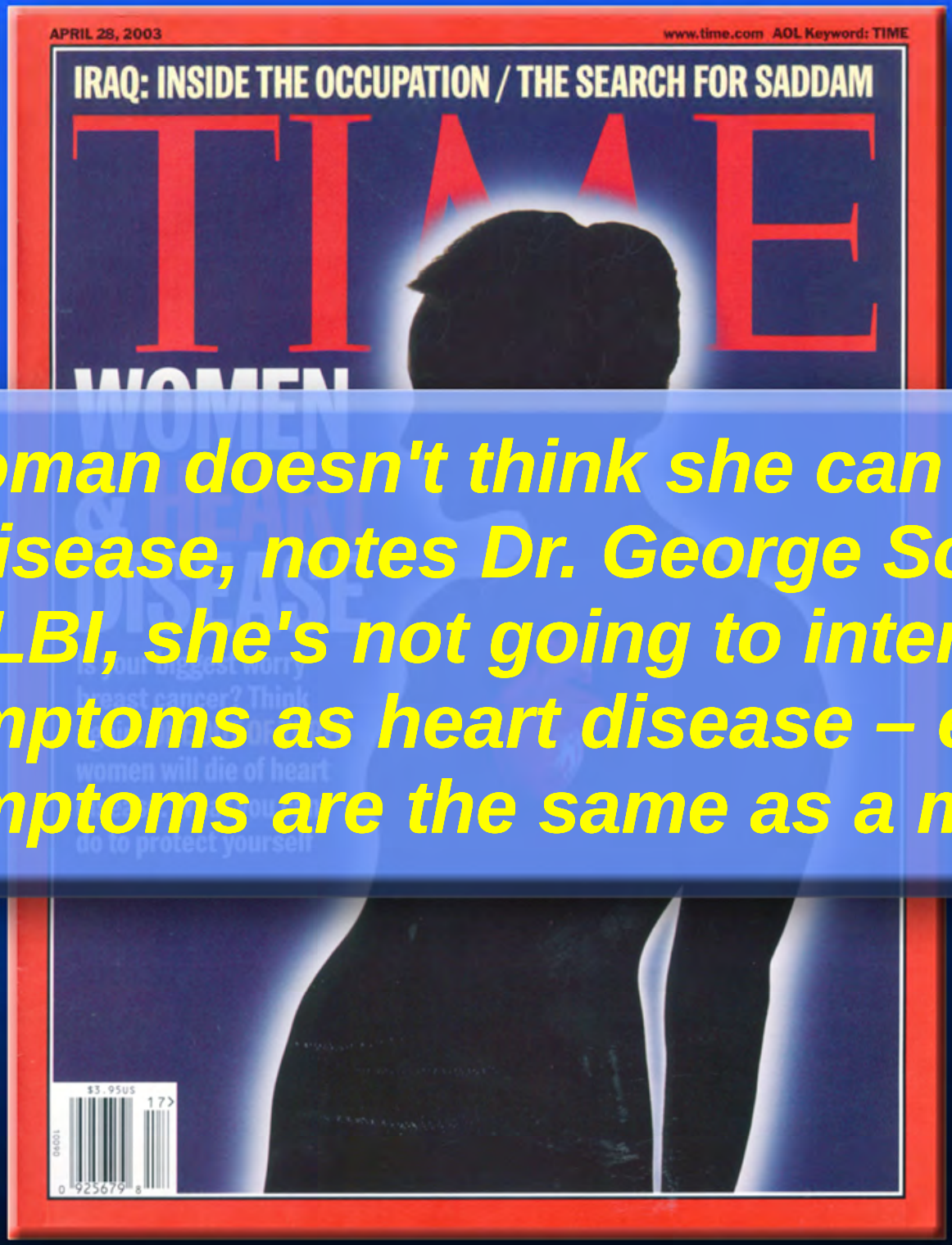


Take Wellness to Heart

Our guide to fighting heart disease and stroke for women ages 25 to 44


APRIL 28, 2003
www.time.com AOL Keyword: TIME
IRAQ: INSIDE THE OCCUPATION / THE SEARCH FOR SADDAM
TIME
WOMEN & HEART DISEASE
Is your biggest worry breast cancer? Think again. ONE OUT OF THREE women will die of heart disease. What you can do to protect yourself
$3.95US
17

CP1110520-1



"If a woman doesn't think she can have heart disease, notes Dr. George Sopko of the NHLBI, she's not going to interpret her symptoms as heart disease – even if her symptoms are the same as a man's."

CP1110520-2

Prevalence of CAD

Regression analysis-1994 vs 79

	OR	95% CI
Age 40	0.43	0.24-0.80
Age 60	0.62	0.45-0.87
Age 80	0.89	0.89-1.23

Am J Med 2001

Heart failure after MI

- After adjusting for age, hypertension, smoking, peak CK and comorbidity, post-MI HF declined by 2% per year.
- RR of developing HF for MIs occurring in 1994 vs 1979 0.71 (95% CI, 0.54-93), indicates a 29% reduction in post-MI HF.
- Consistent with the decline in MI severity and indicates that the contribution of MI to HF is declining

JP Hellermann- Am J EPI 2003