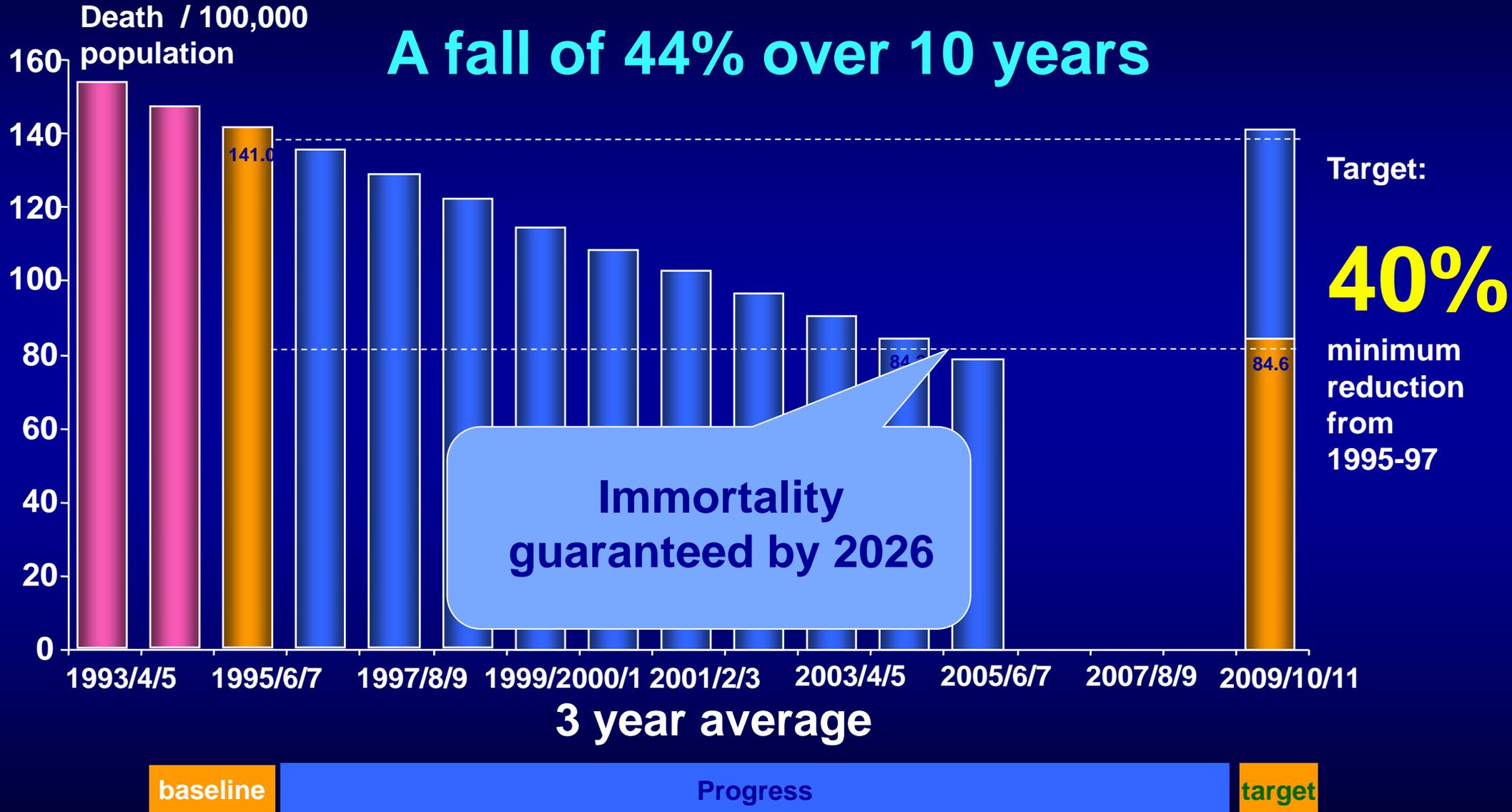


Circulatory Disease Mortality Target:

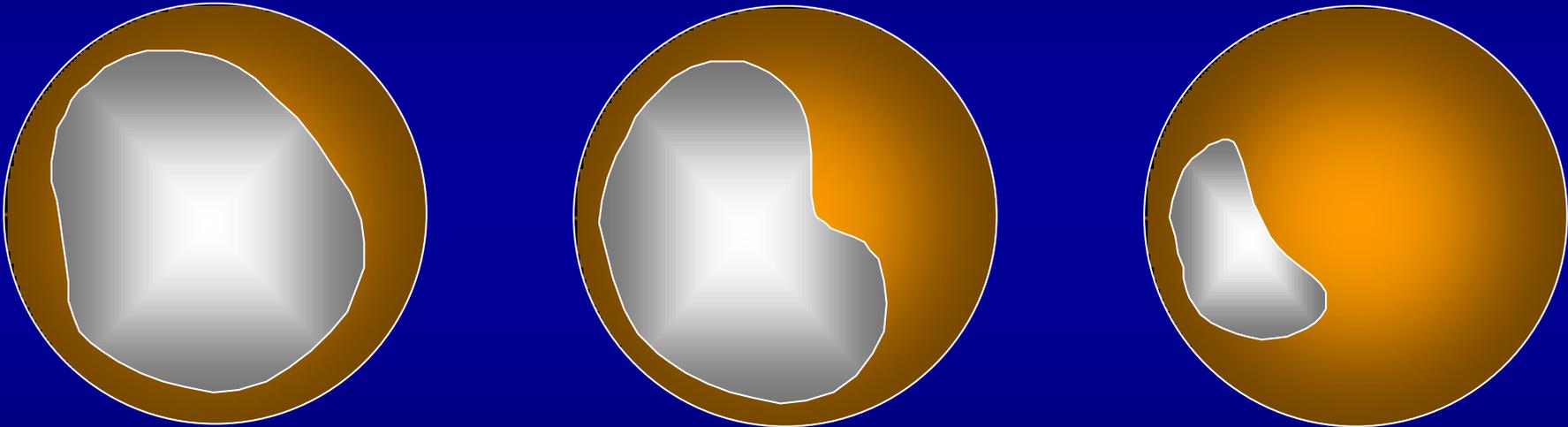
Death rates in England 1993-2006 Persons under 75



Source: ONS (ICD9 390-459; ICD10 I00-I99)

Evolution of Atherosclerosis

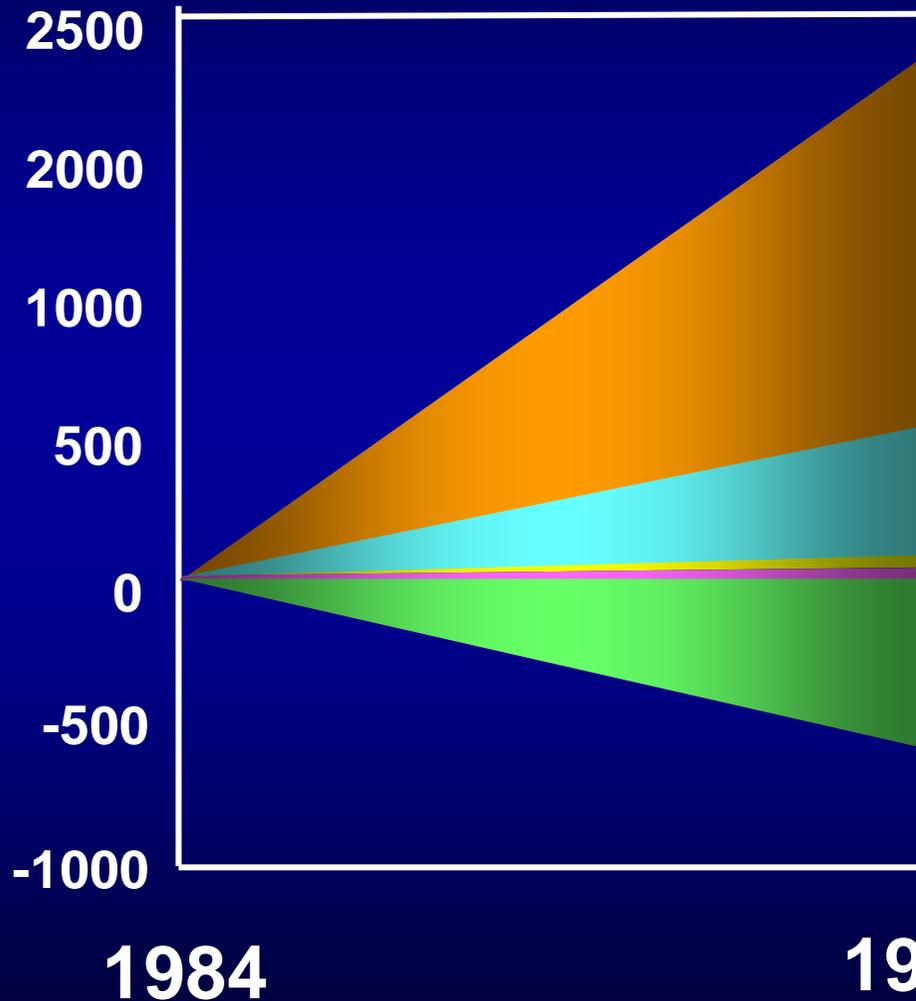
Genetic **Environmental**



Clinical Events

0 20 40 60 Age (yrs)

Coronary Heart Disease Mortality in Beijing 1984-1999

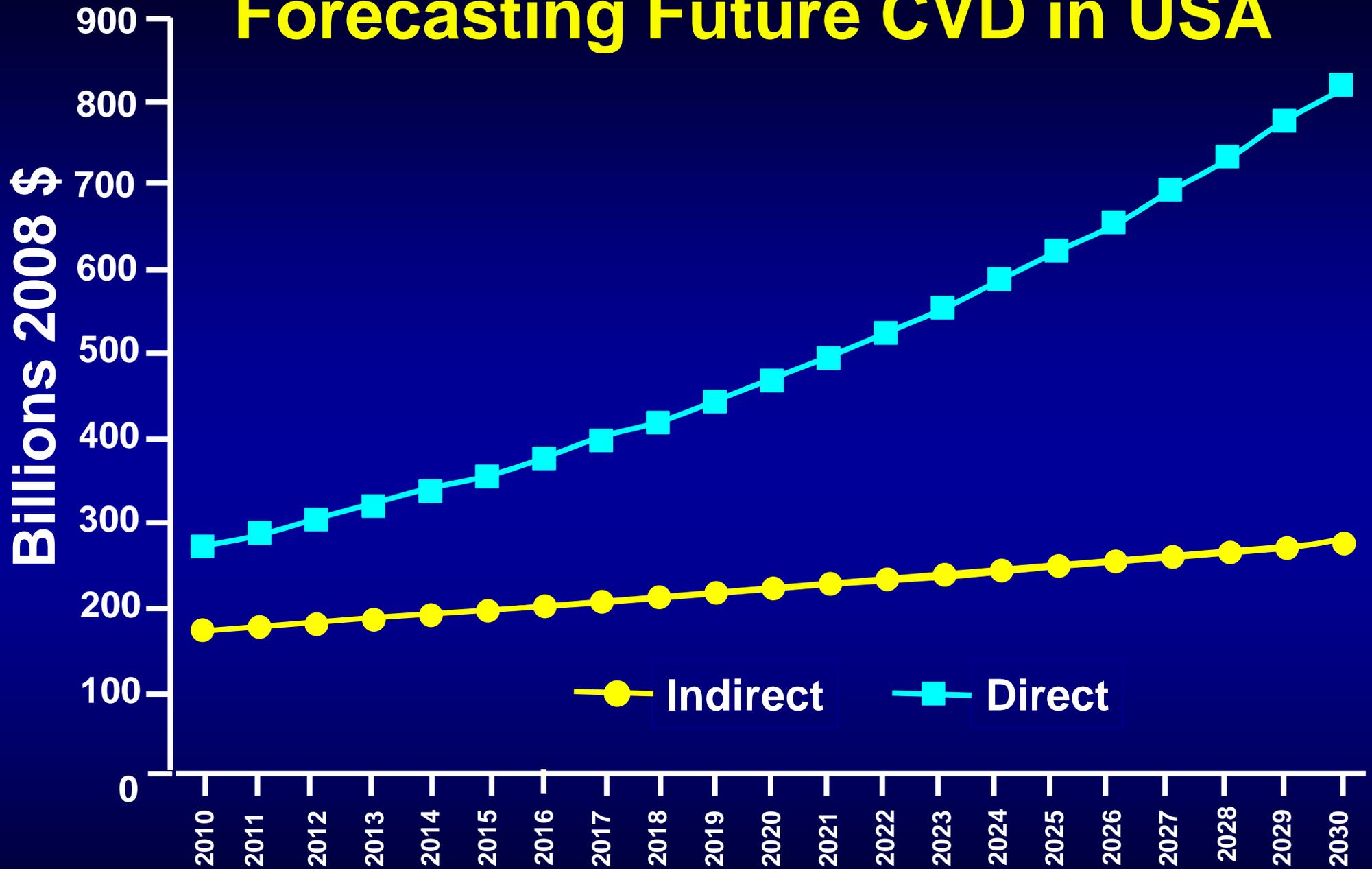


1822 Extra deaths Attributable to Risk Factor Changes

	Cholesterol	77%
	Diabetes	19%
	BMI	4%
	Smoking	1%
	642 fewer deaths by treatments	

AMI treatments	41%
Hypertension treatment	24%
Secondary prevention	11%
Heart failure	10%
Aspirin for Angina	10%
Angina: CABG & PTCA	2%

Forecasting Future CVD in USA



Heidenreich Circ 2011; 123: 933-944

Emergence of Health Maintenance as the Business of Health Care



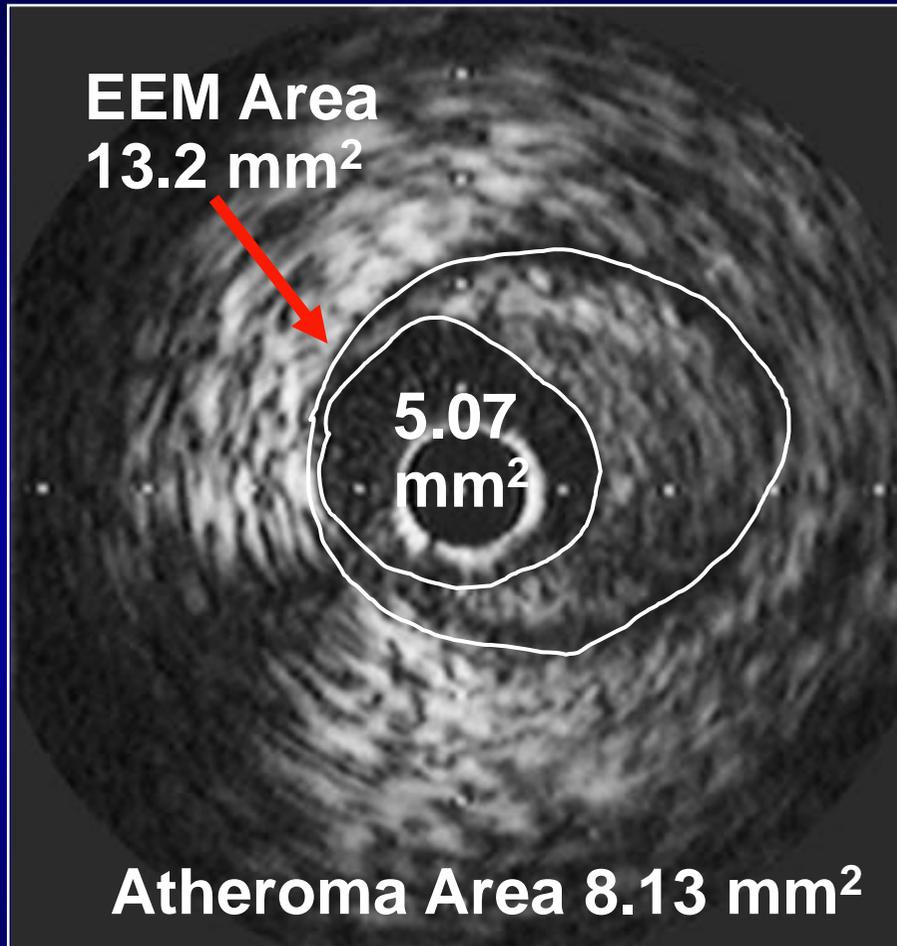
Eastman Kodak
filed for
bankruptcy on Jan
19 2012 after 131
years

“Move from product orientated
industry to customer orientated one”

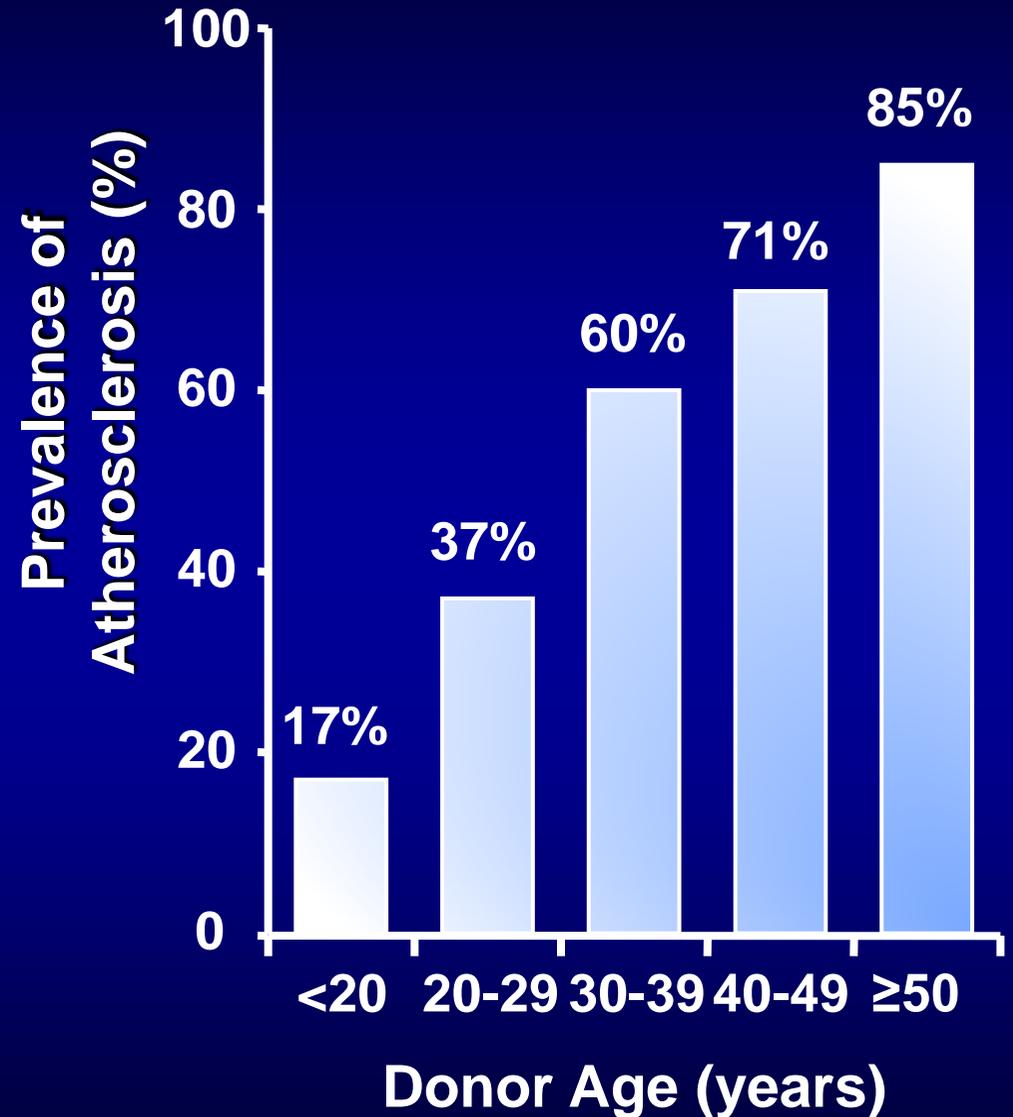
Lifetime Management of Atherosclerosis Risk

**Early intervention
pays long term
dividends**

Prevalence of Atherosclerosis by Donor Age

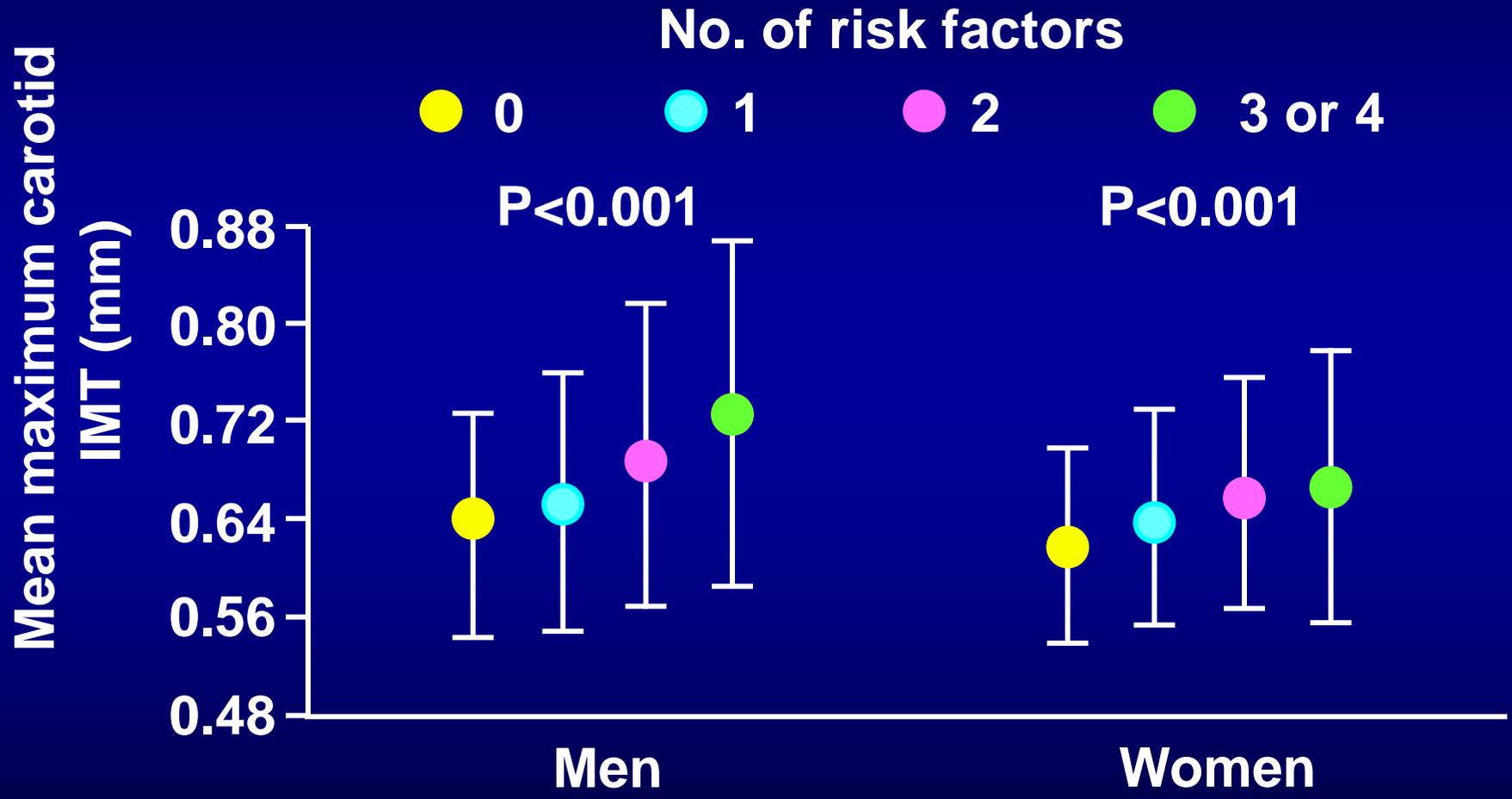


32 Year Old Female



CV Risk Factors in Childhood and Carotid IMT in Adults

Risk factors measured at ages 12-18yrs



Epidemiology and Prevention

Childhood Physical, Environmental, and Genetic Predictors of Adult Hypertension

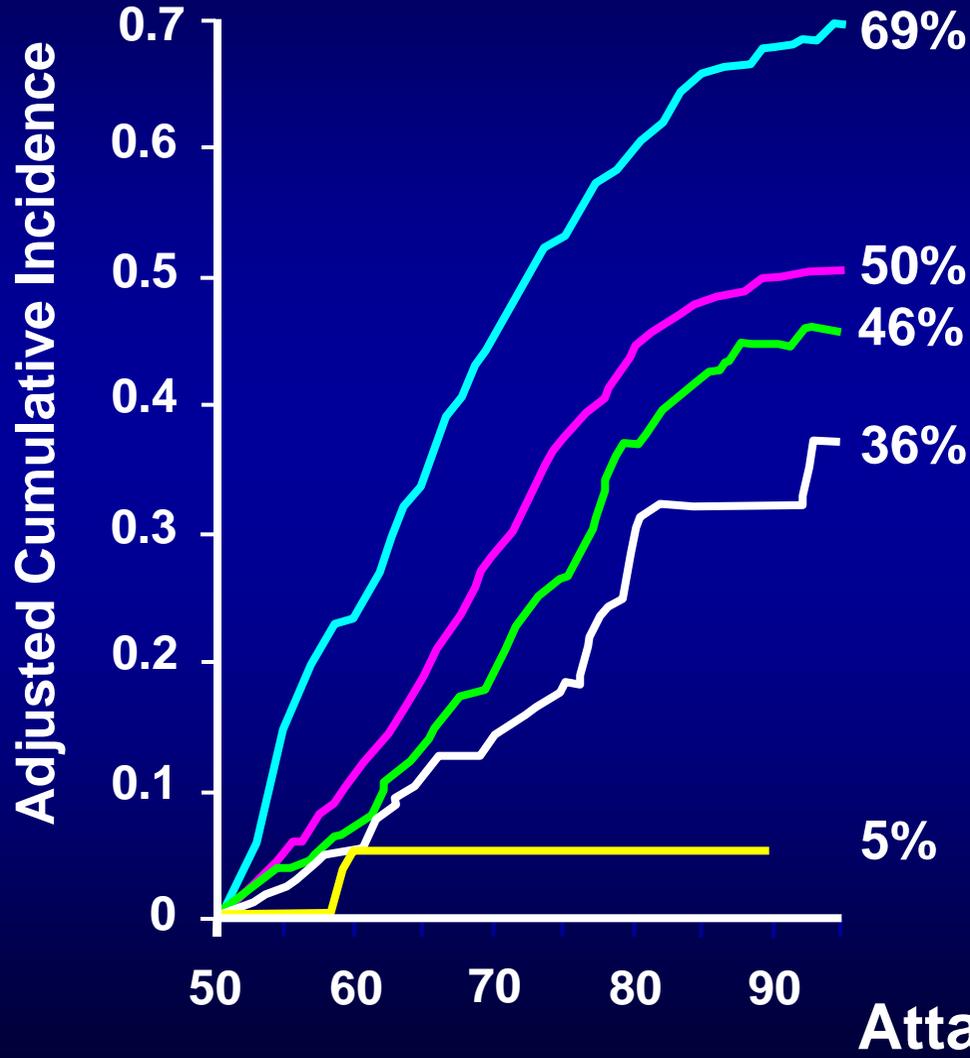
The Cardiovascular Risk in Young Finns Study

Jonna Juhola, MD; Mervi Oikonen, PhD; Costan G. Magnussen, PhD; Vera Mikkilä, PhD;
Niina Siitonen, PhD; Eero Jokinen, MD, PhD; Tomi Laitinen, MD, PhD; Peter Würtz, PhD;
Samuel S. Gidding, MD; Leena Taittonen, MD, PhD; Ilkka Seppälä, MSc; Antti Jula, MD, PhD;
Mika Kähönen, MD, PhD; Nina Hutri-Kähönen, MD, PhD; Terho Lehtimäki, MD, PhD;
Jorma S.A. Viikari, MD, PhD; Markus Juonala, MD, PhD; Olli T. Raitakari, MD, PhD

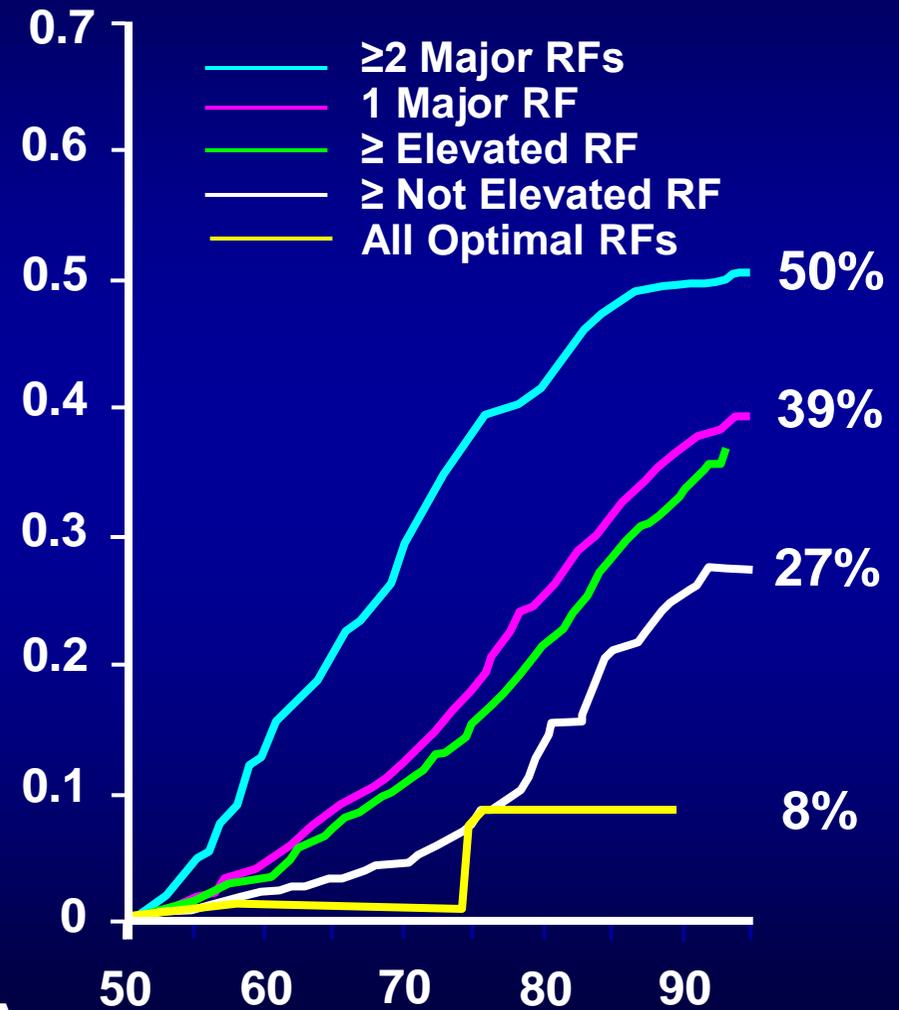
Conclusions—Prediction of adult hypertension was enhanced by taking into account known physical and environmental childhood risk factors, family history of hypertension, and novel genetic variants. A multifactorial approach may be useful in identifying children at high risk for adult hypertension. (*Circulation*. 2012;126:402-409.)

Framingham Heart Study :Lifetime Risk

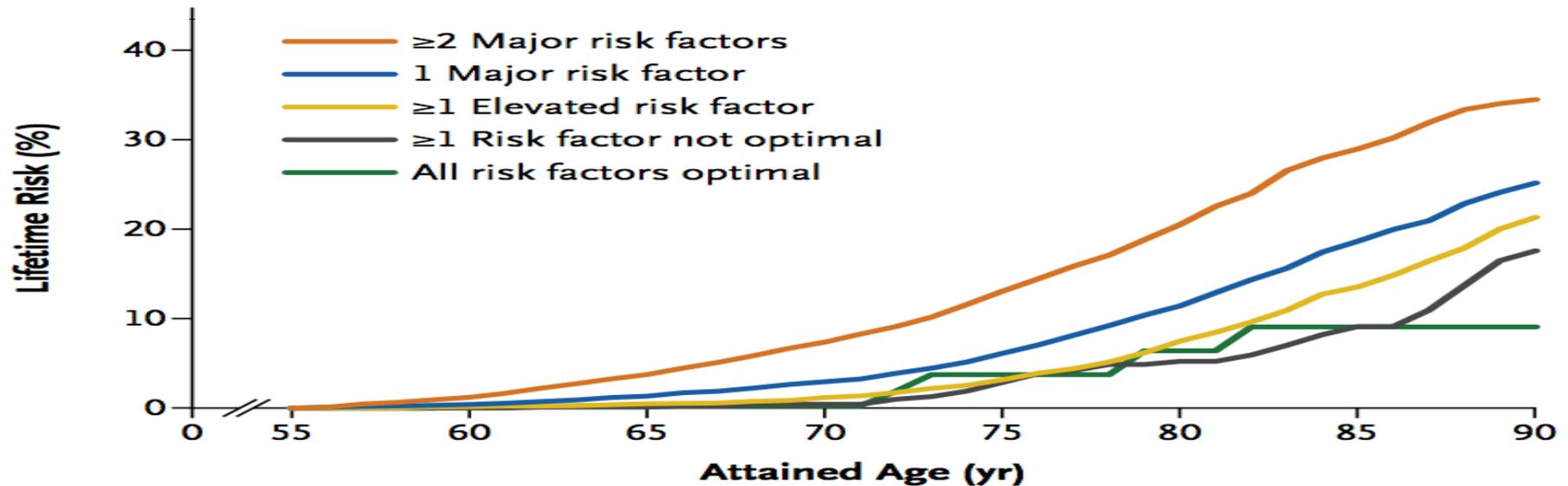
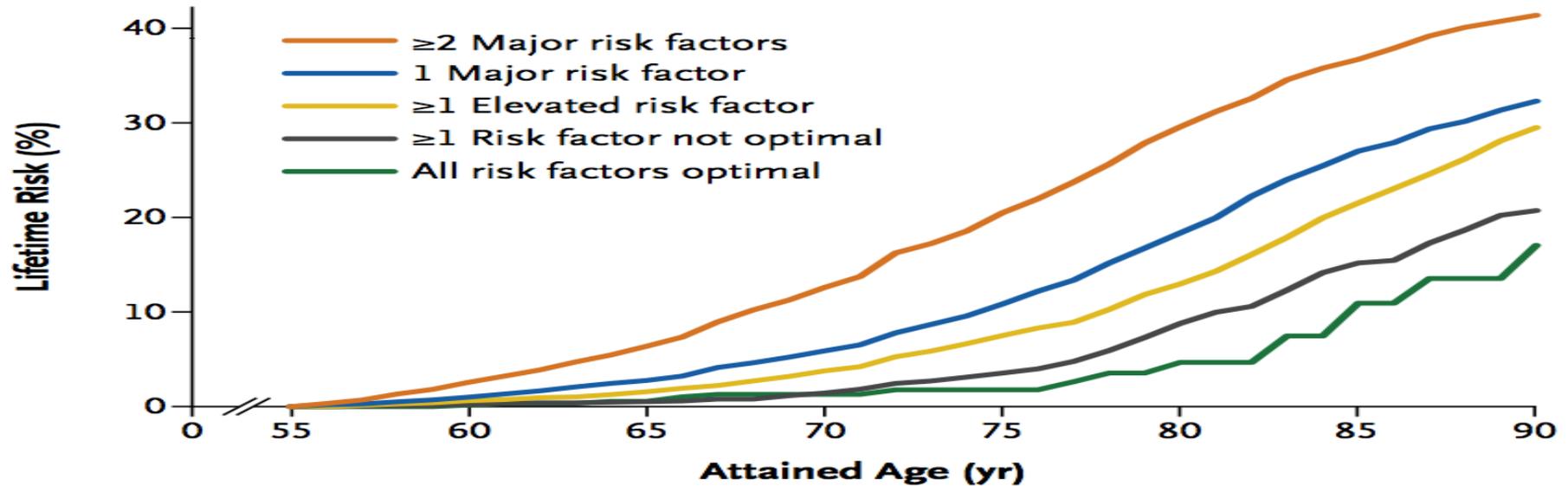
Men



Women

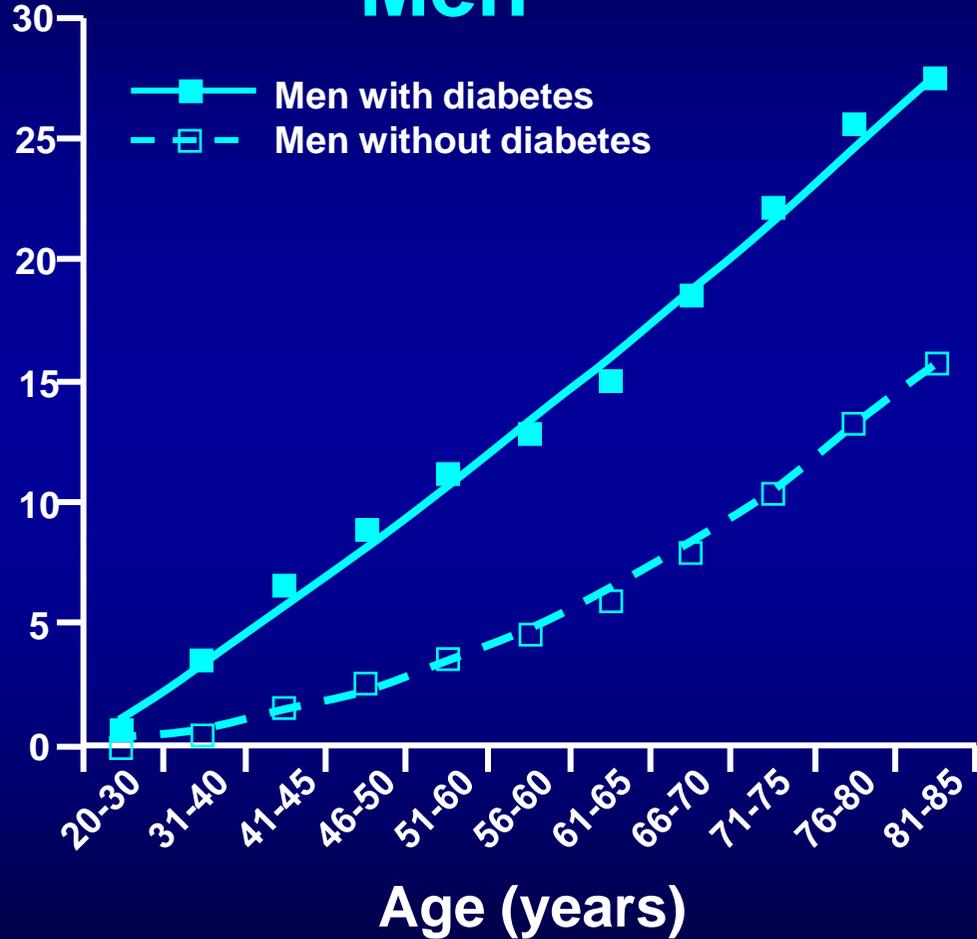


Lifetime Risk of Death from CV Disease

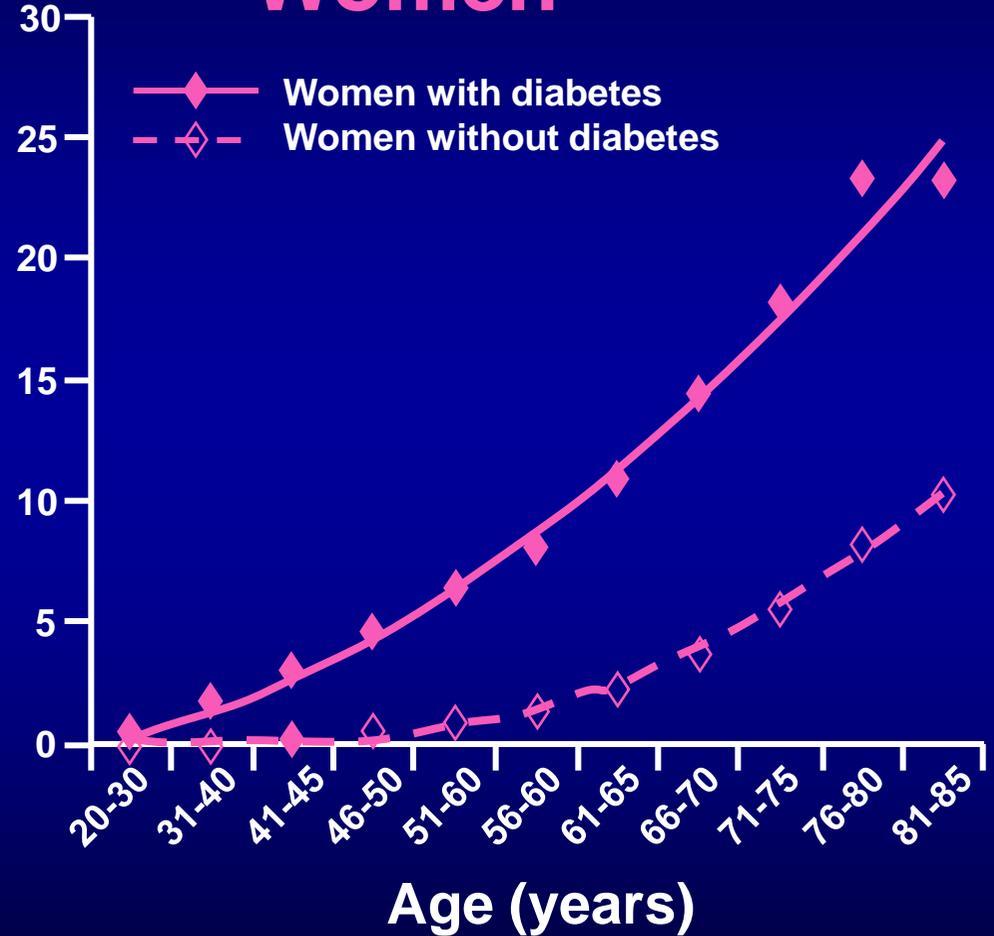


Age and CV Risk in Diabetes

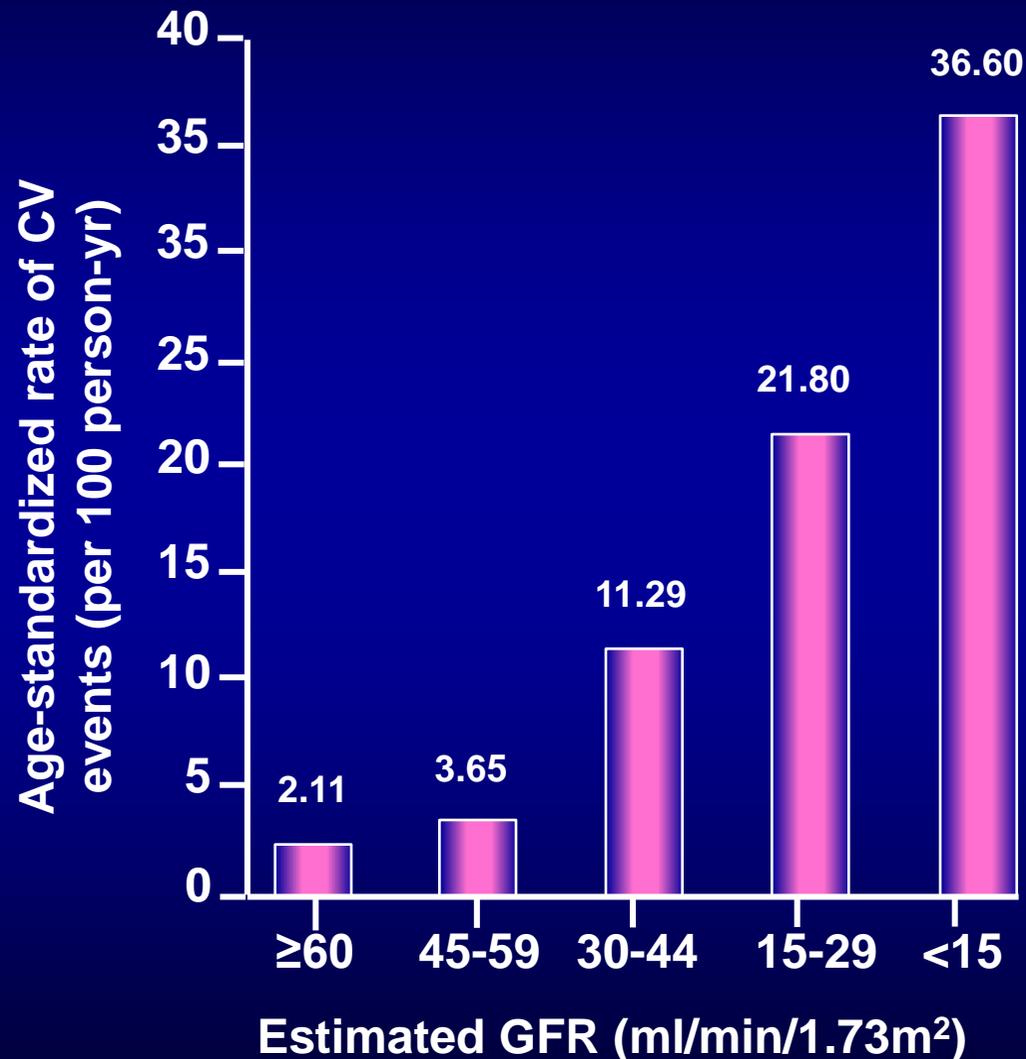
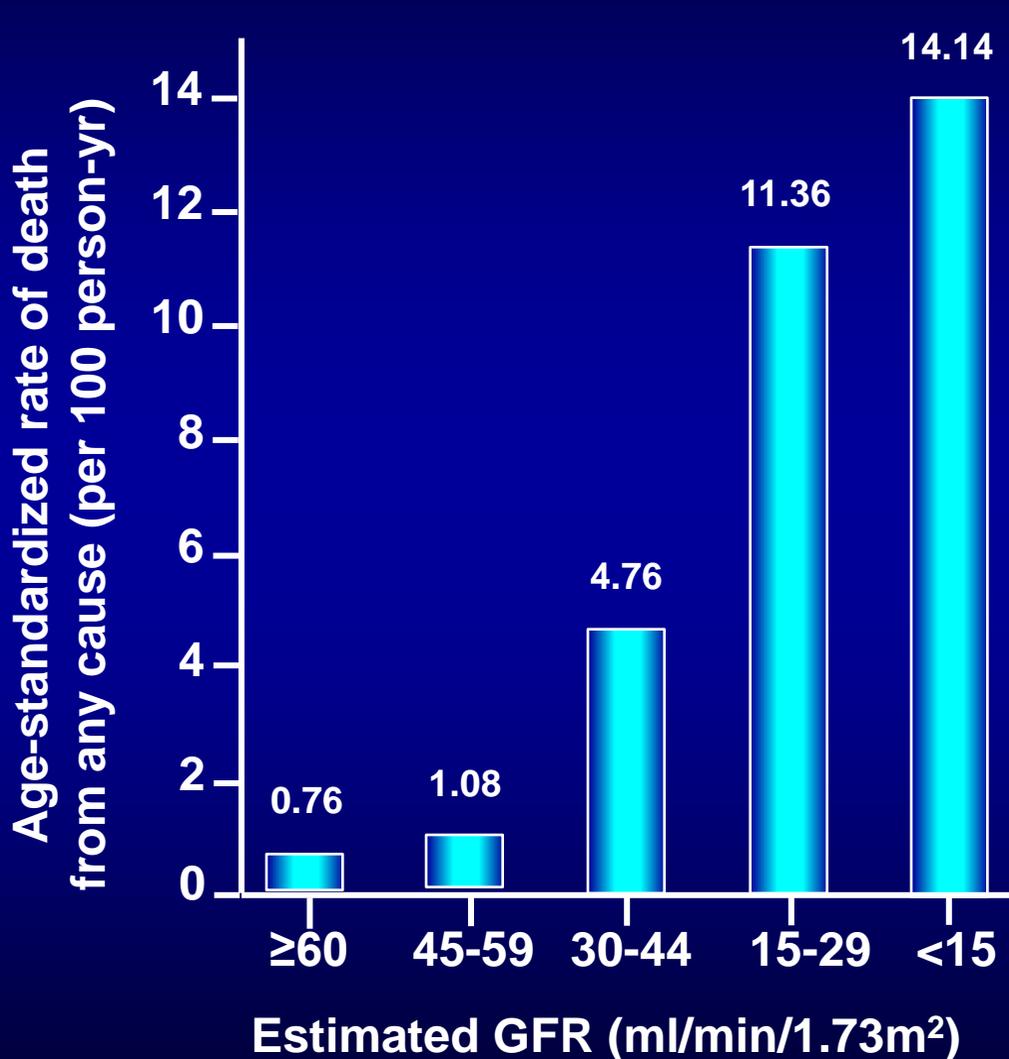
Men



Women

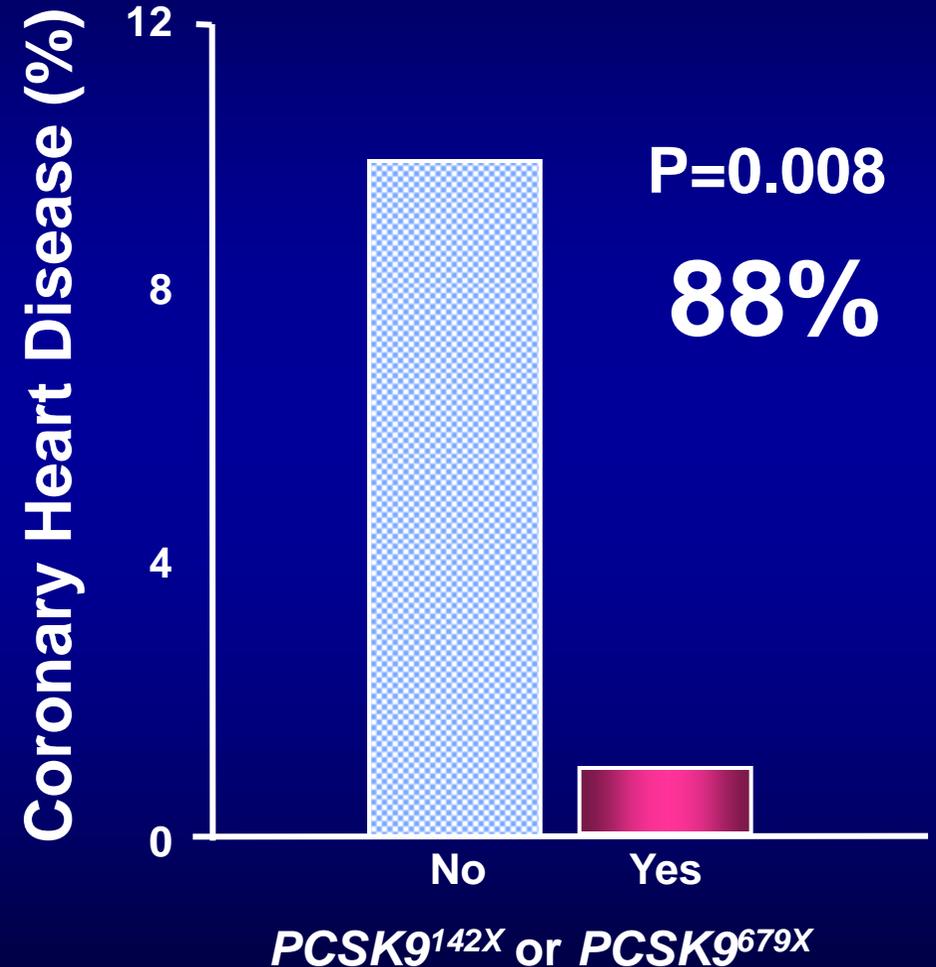
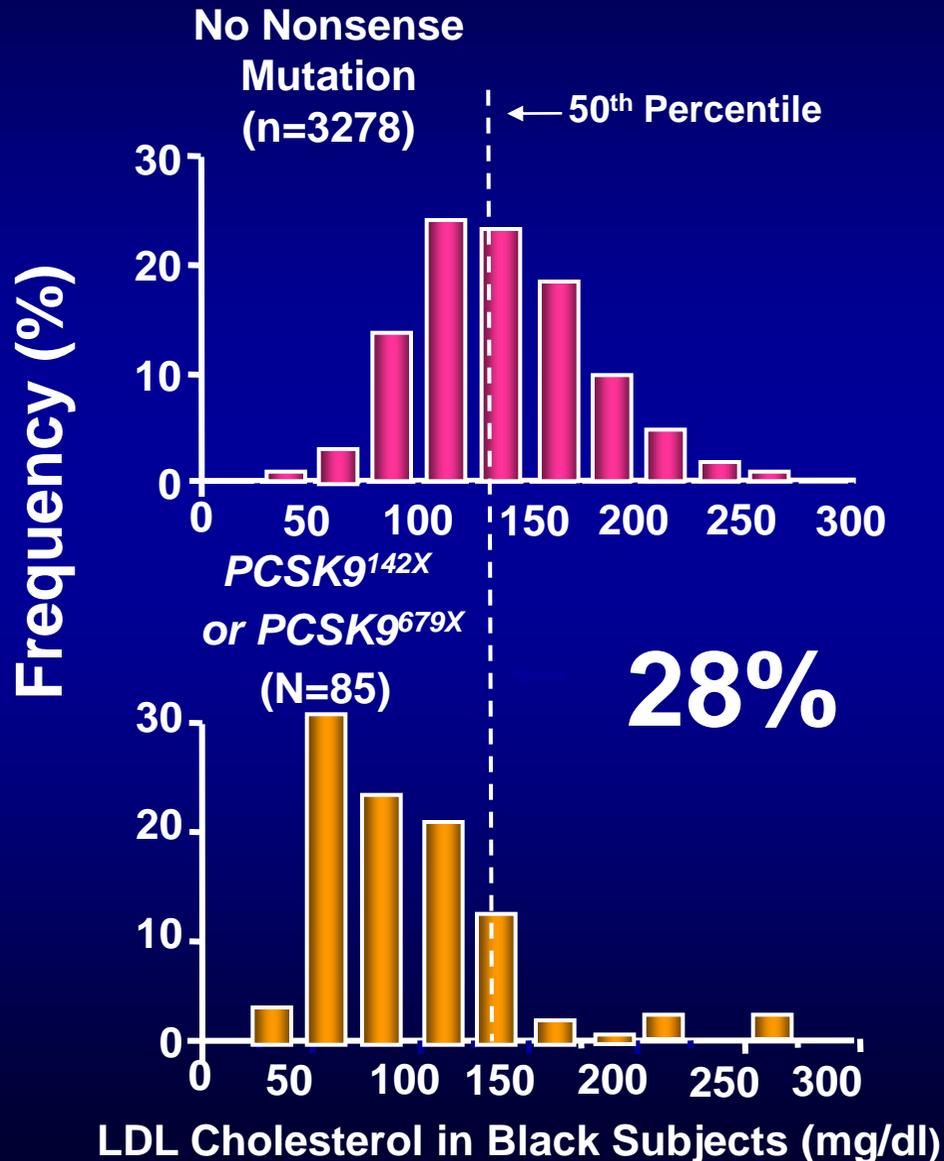


Independent and Graded Association between GFR and CVD



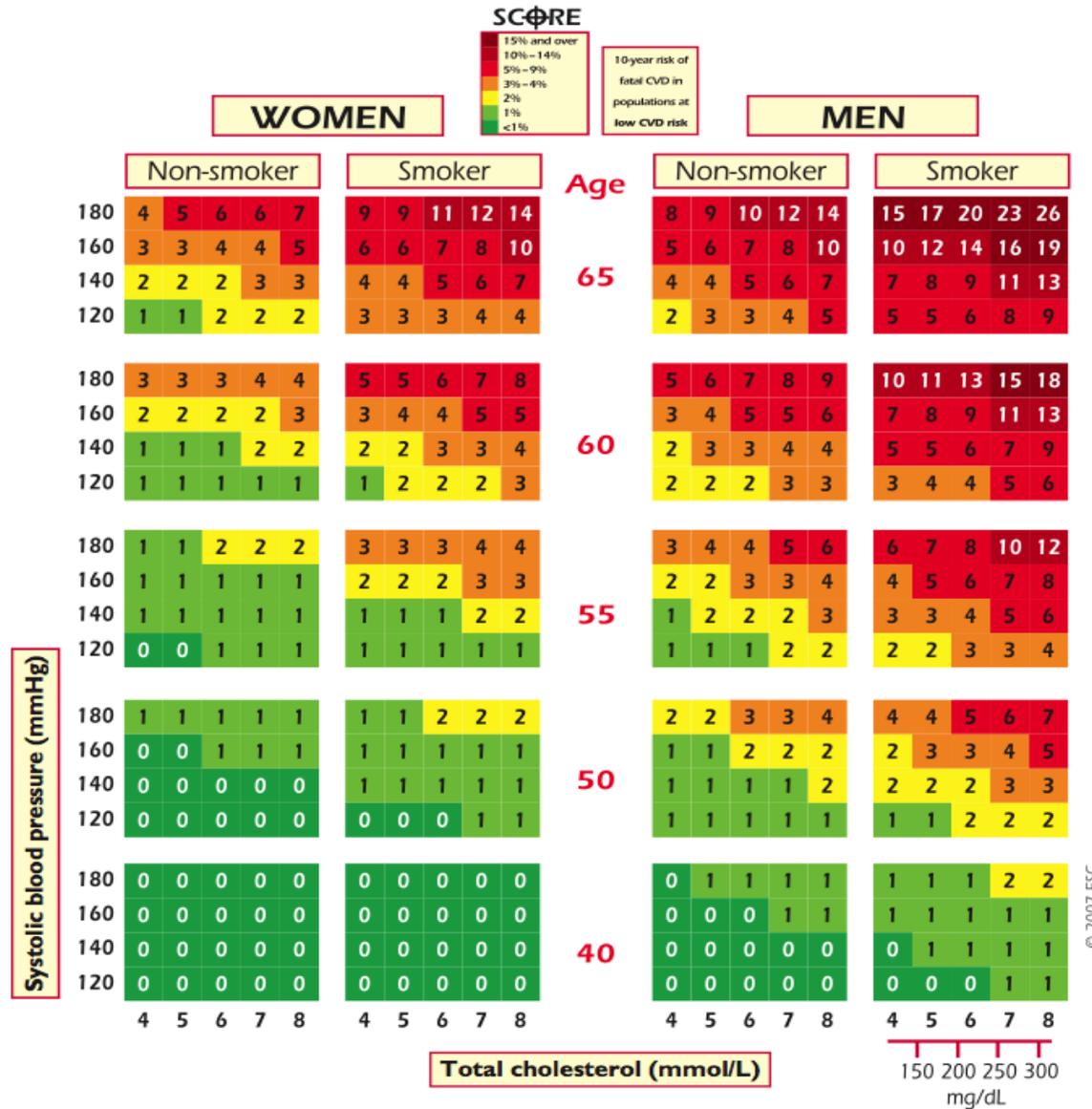
Go et al; NEJM 2004

LDL Cholesterol and Coronary Heart Disease among Black Subjects by *PCSK9*^{142X} or *PCSK9*^{679X} Allele



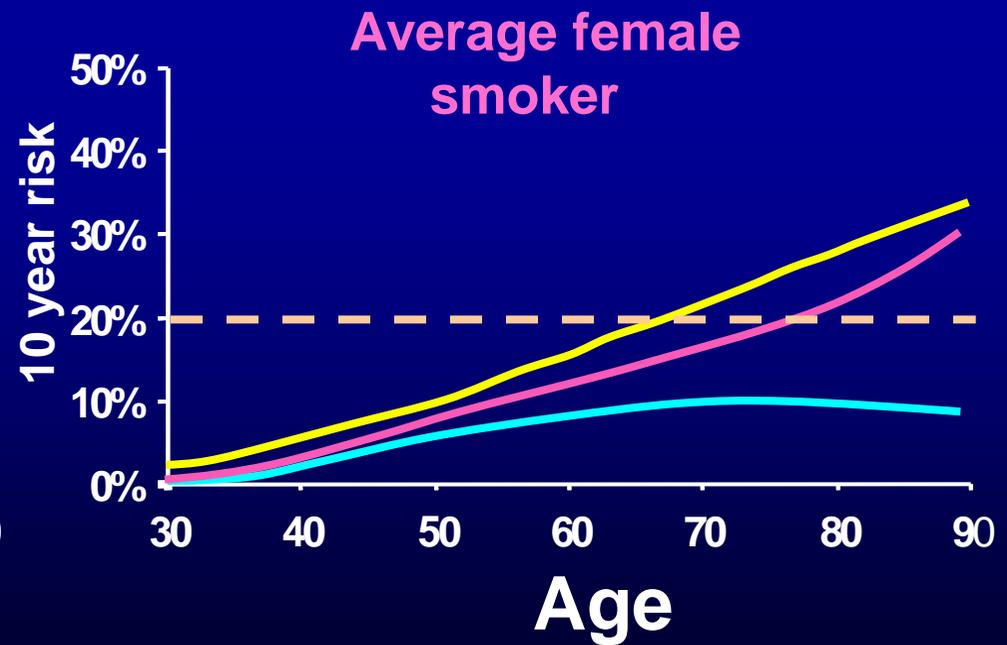
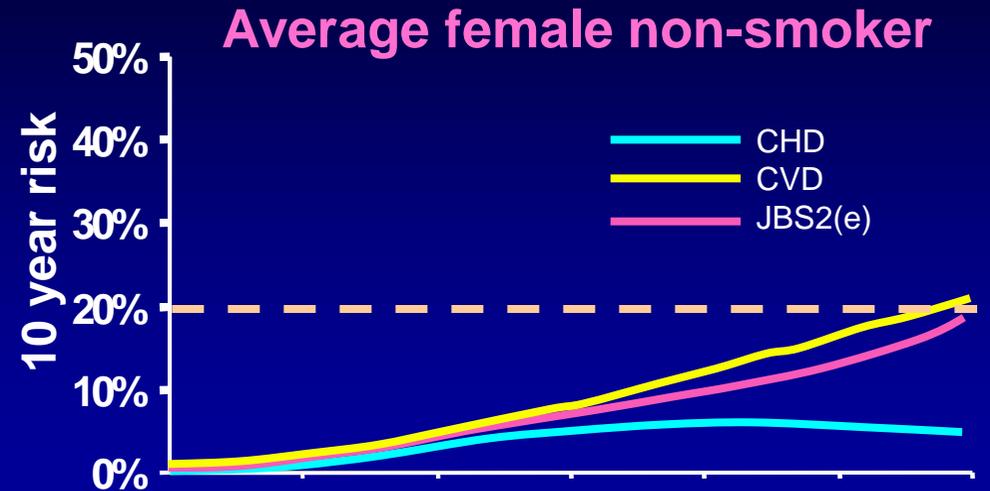
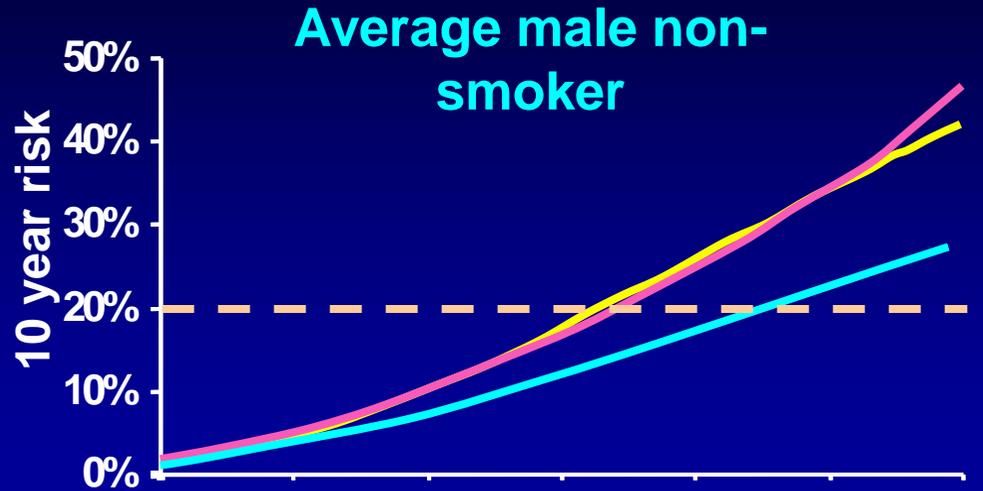
Cohen NEJM 2006; 354:1264-72

ESC CV Prevention Guidelines 2012



Low CVD countries are Andorra, Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, The Netherlands, Norway, Portugal, San Marino, Slovenia, Spain, Sweden, Switzerland, United Kingdom.

Importance of Lifetime Risk



Short Term v. Lifetime Risk in USA

- Non-smoking men <45yrs
 - All women <65yrs
- <10% 10yr CHD Risk**

Marma Circ 2009;120:384-390

- 56% of US adults (87,000,000) have low (<10%) 10yr and high lifetime ($\geq 39\%$) risk

Marma Circ Cardiothoracic Qual Outcomes 2010;3:8-14

Joint British Societies (JBS3): CV Risk Management Lifetime risk calculator

- New metrics for communication**
- Heart age**
- Age at 1st CV event**

Profile

Heart Age

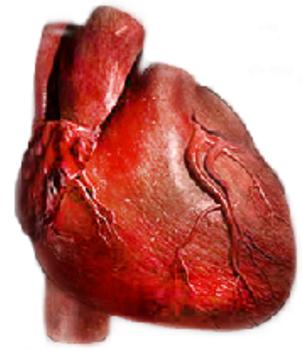
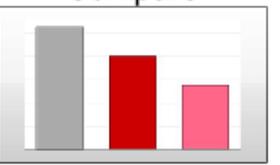
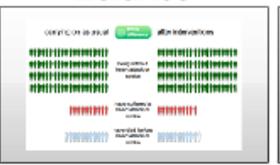
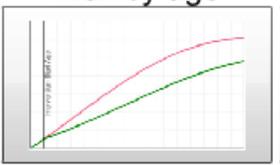
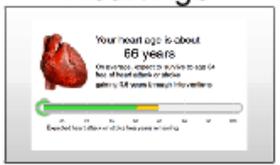
Outlook

Risk by age

Outcomes

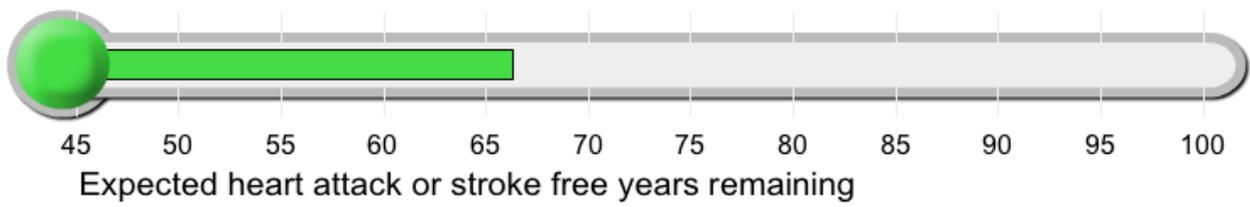
Balance

Compare



Your heart age is about **57**

On average, expect to survive to age 66 free of heart attack or stroke



Interventions

Systolic Blood Pressure

160 → 160

Cholesterol Ratio:

5.60 → 5.6

Weight (Kg)

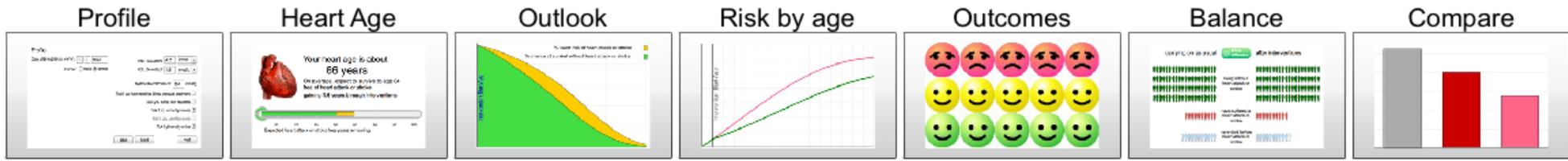
94.0 → 94

Future smoking category

Moderate smoker

Reset

New UK JBS3 Lifetime Risk Calculator



What we expect to happen in 10 years to 100 people like you

Interventions

carrying on as usual



after interventions



88 living without heart attack or stroke



93



8 suffered a heart attack or stroke



4



5 died before heart attack or stroke



3

Systolic Blood Pressure

160 → 130

Cholesterol Ratio:

5.60 → 4

Weight (Kg)

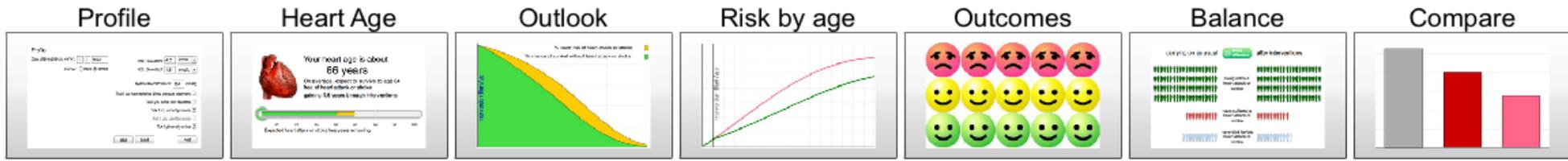
94.0 → 75

Future smoking category

Quit smoking



Intervention start age 44 Target interval 10



What we expect to happen in 20 years to 100 people like you

Interventions

carrying on as usual

Show difference

after interventions

Systolic Blood Pressure

160 → 130

Cholesterol Ratio:

5.60 → 4

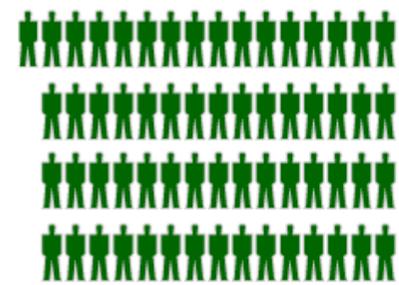
Weight (Kg)

94.0 → 75

Future smoking category

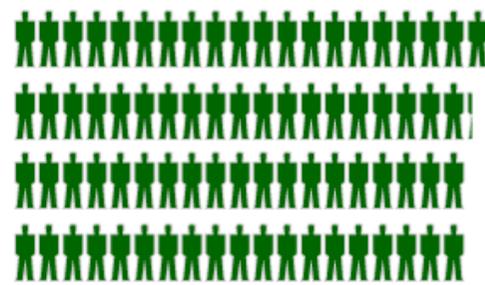
Quit smoking

Reset



61 living without heart attack or stroke

77



25 suffered a heart attack or stroke

13



15 died before heart attack or stroke

10



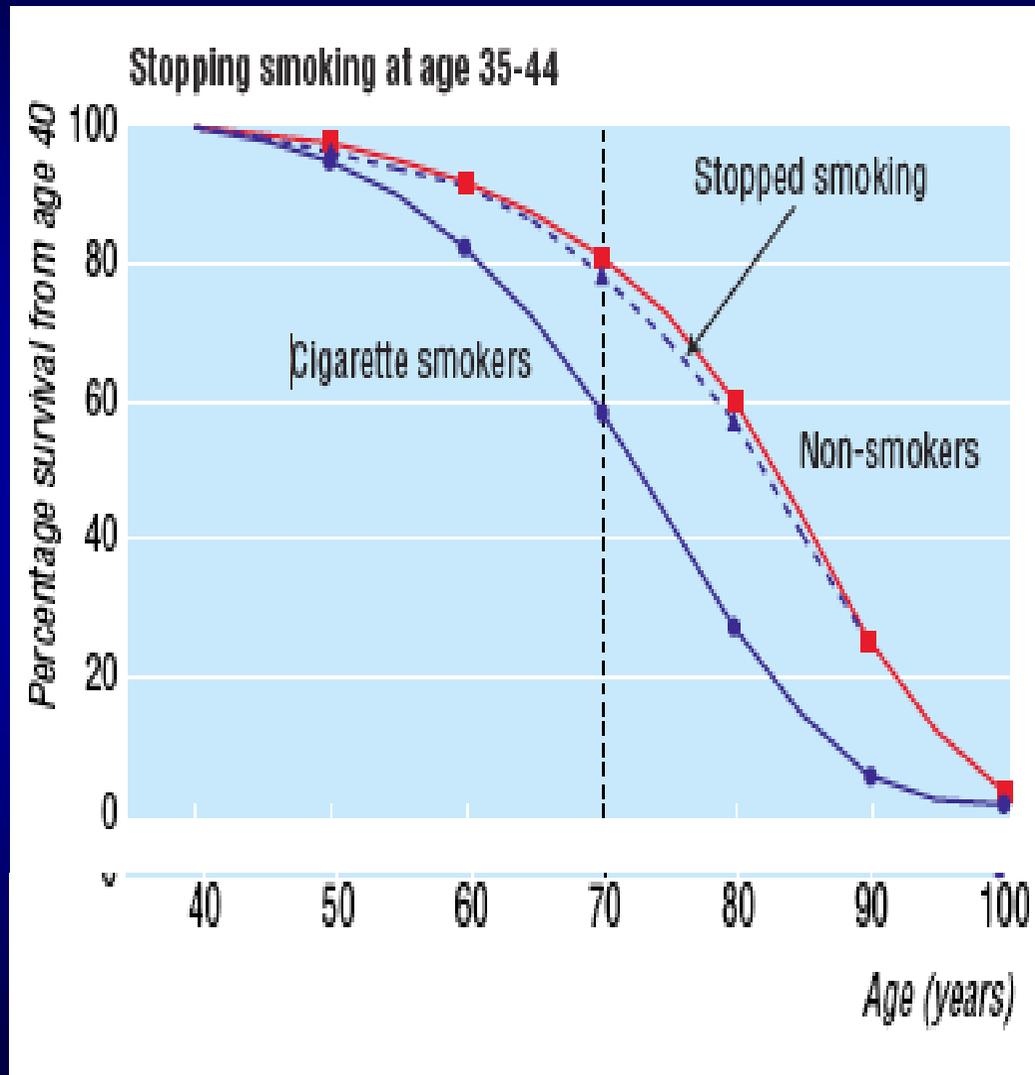
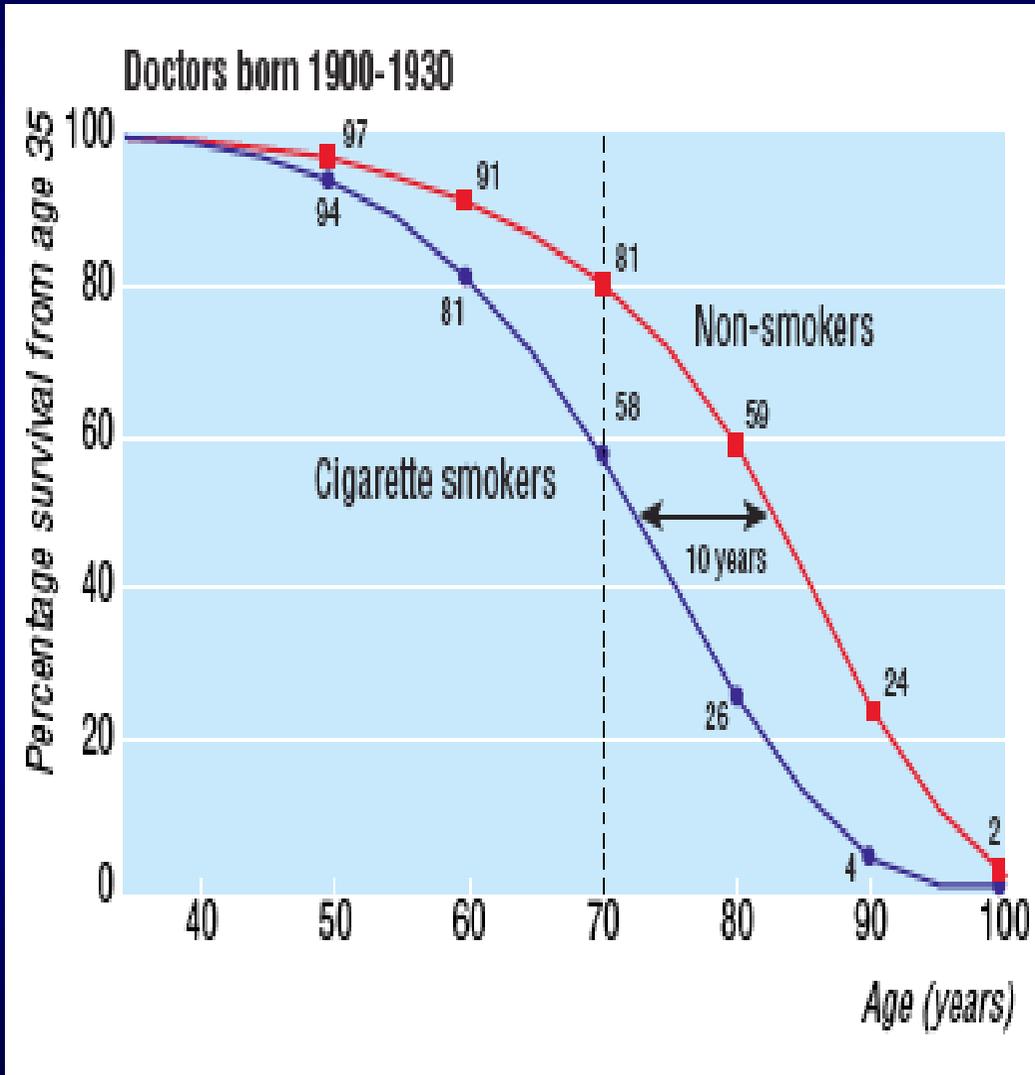
Intervention start age 44 Target interval 20

**How early should
prevention start?**





Benefit of Smoking Cessation



Obesity in the Young



13 year old boy
weighing 11.2kg
more than normal
runs 33%
increased
probability of a
CV event < 60Yrs

**“The commonest instruments
of suicide are a knife and fork”**

Martin Fischer

Childhood Adiposity, Adult Adiposity, and Cardiovascular Risk Factors

BACKGROUND

Obesity in childhood is associated with increased cardiovascular risk. It is uncertain whether this risk is attenuated in persons who are overweight or obese as children but not obese as adults.

Persons who were overweight or obese during childhood but were nonobese as adults had risks of the outcomes that were similar to those of persons who had a normal BMI consistently from childhood to adulthood ($P > 0.20$ for all comparisons).

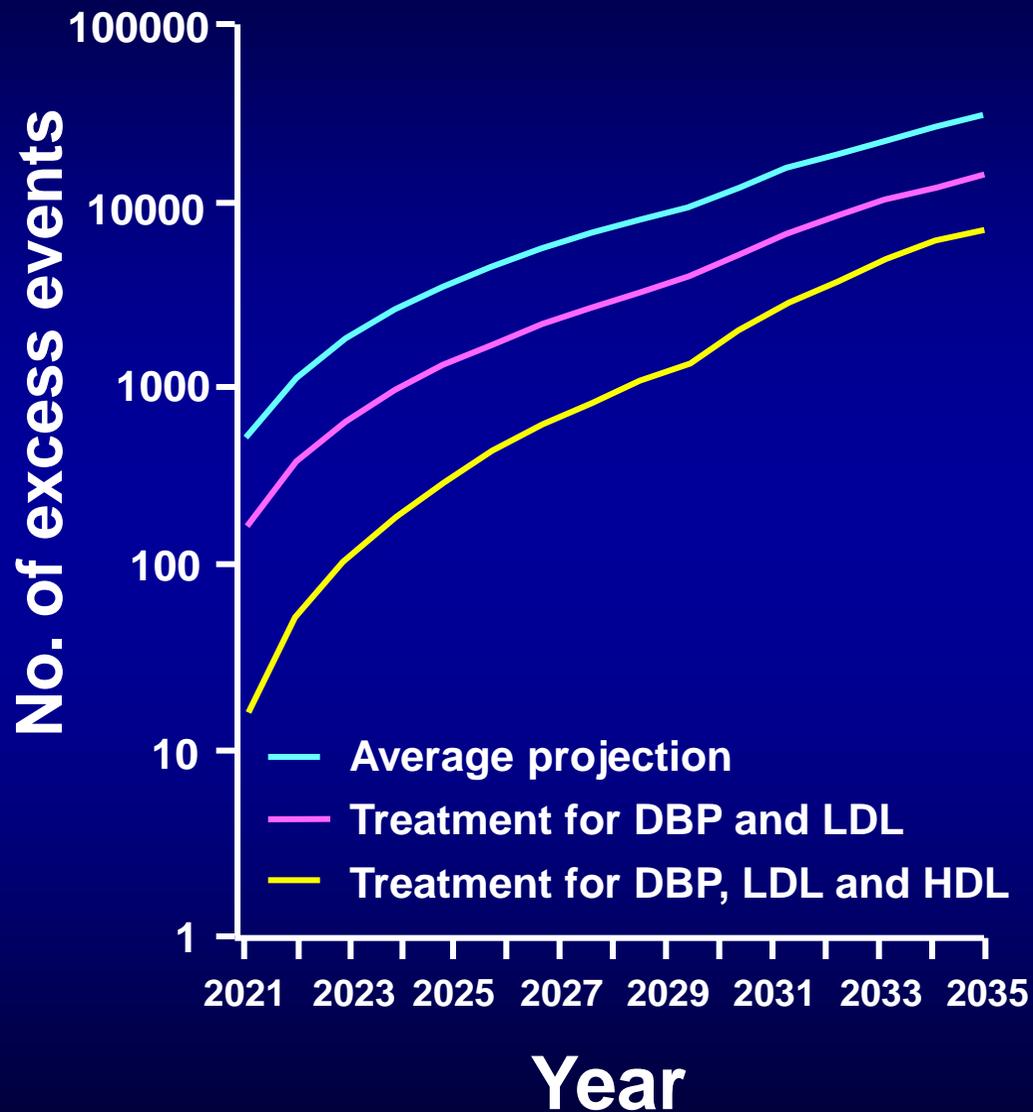
Responsibility for Childhood Obesity?



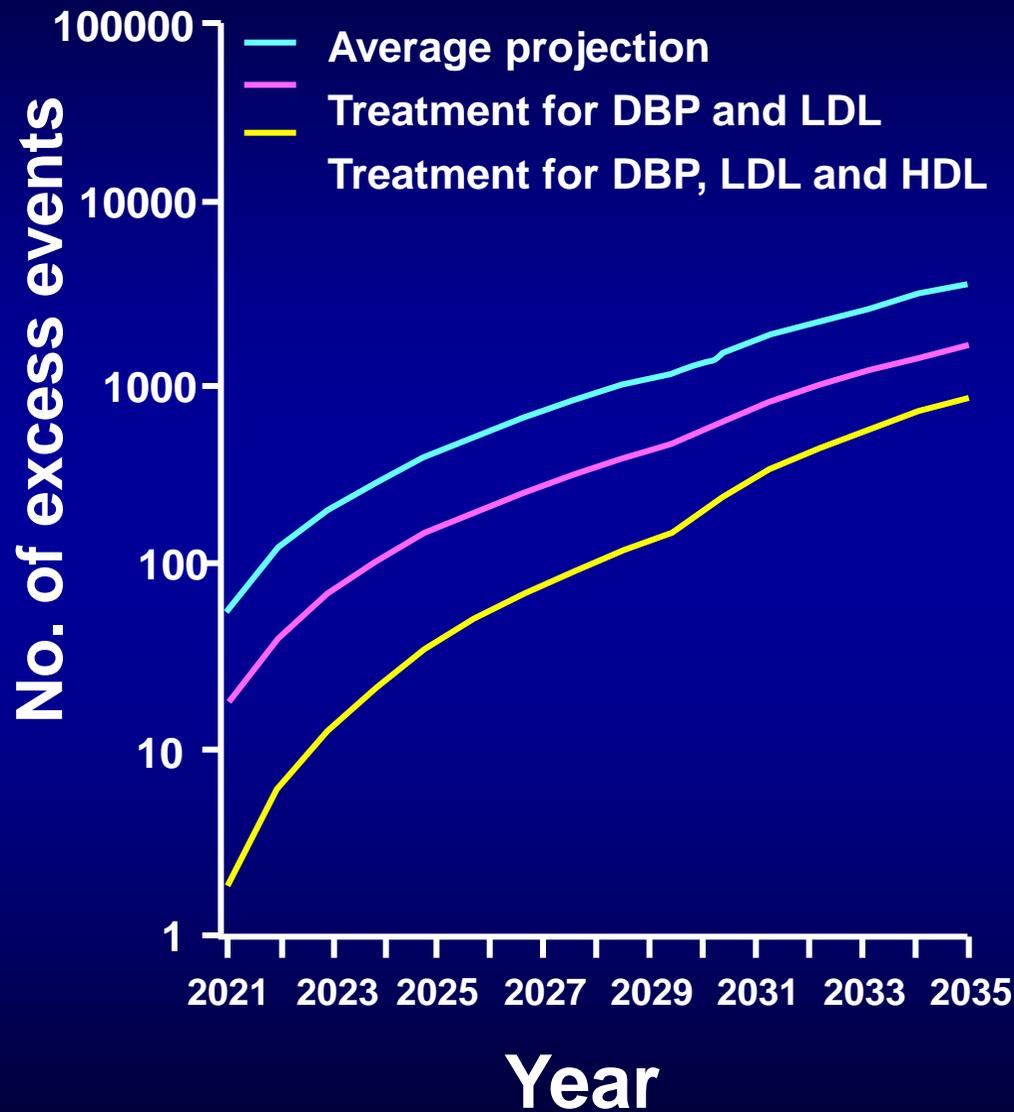
'Sell health as a valued commodity'

Potential Benefit of CV RF treatment in Obesity

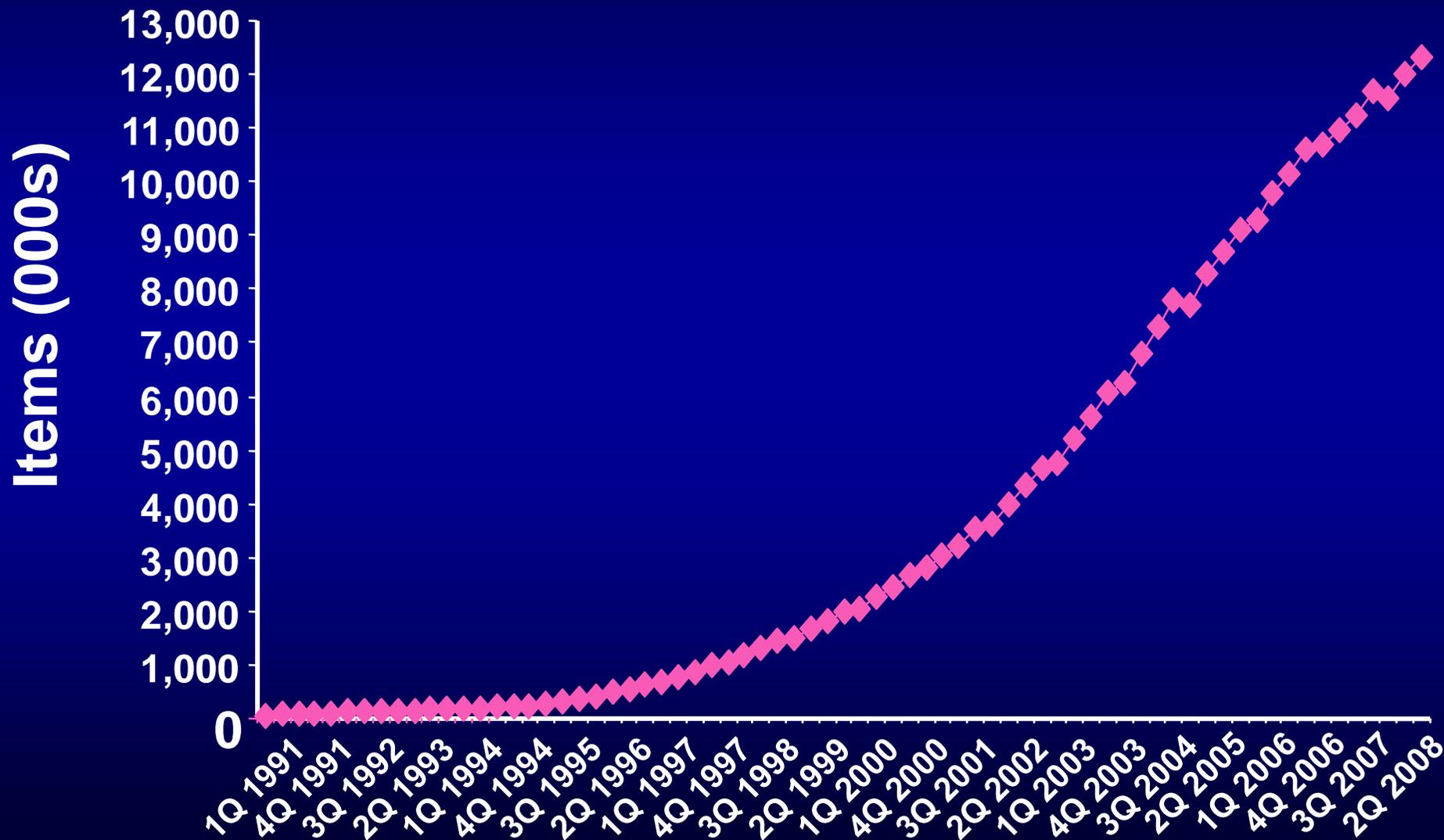
Excess Total CHD Events



Excess Deaths from CHD



Number of Prescriptions for Statins each Quarter in England

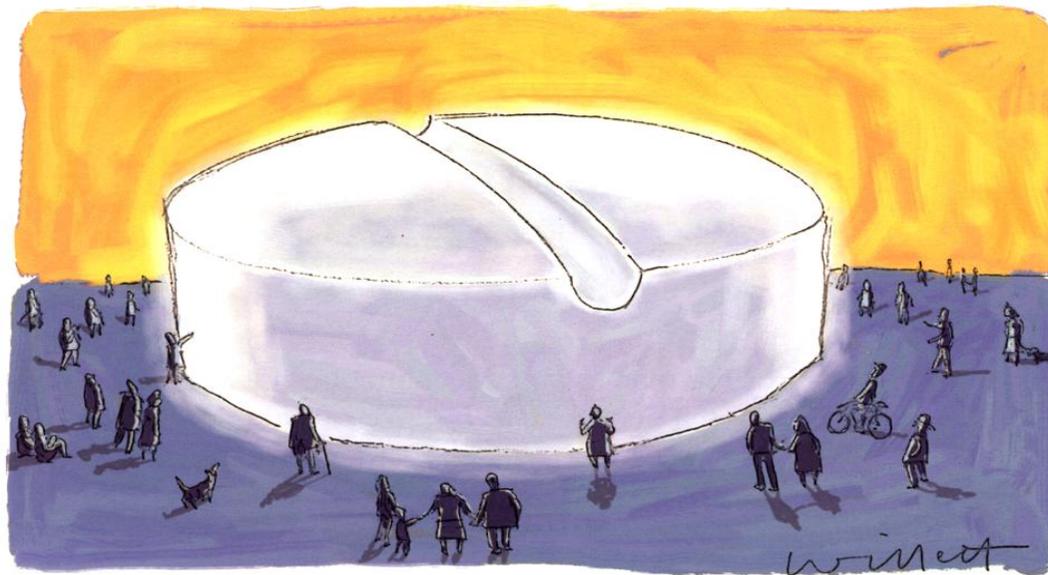


Polypill Concept

28 June 2003

BMJ

326: 1407-1466 No 7404 28 JUNE 2003 Clinical research ISSN 0959-8138



A pill to prevent 80% of heart attacks

Polypill would contain a statin, three antihypertensives, folic acid, and aspirin pp1407, 1419, 1423, 1427

Statin Therapy in Young Adults

Ready for Prime Time?

Mark J. Pletcher, MD, MPH,*† Stephen B. Hulley, MD, MPH*

San Francisco, California

....Consider statins for younger persons, perhaps starting at 30 in those with risk factors that convey high **lifetime** risk (as opposed to 10 yr risk) for CHD

Ideal CV Health: How Often Do We Get There?

1933 participants in Heart SCORE-only 1 with 7 components

AHA Definition

Non smoking

BMI <25kg/m²

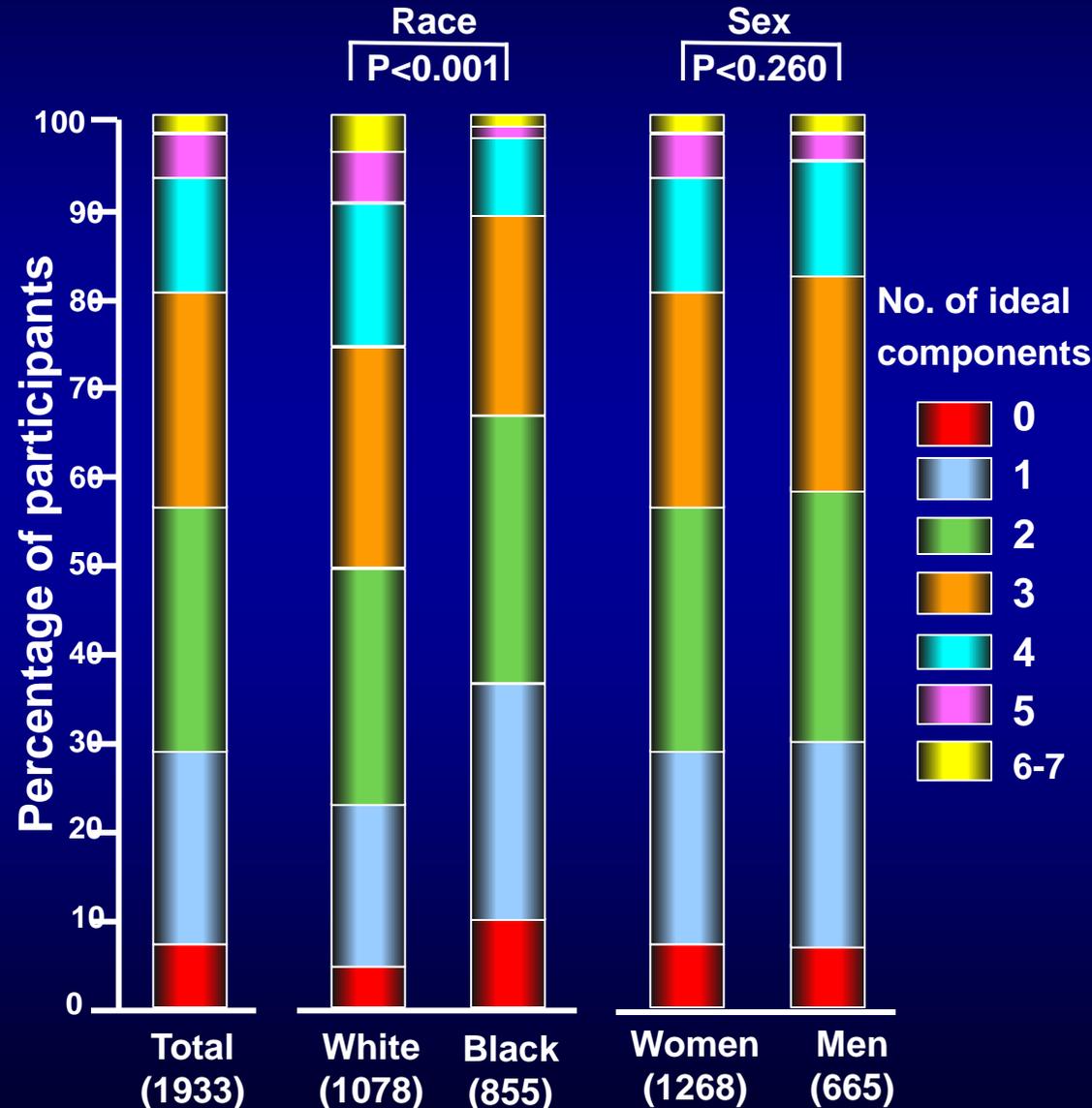
Physical Activity

Recommended diet

Untreated TC <200 mg/dl

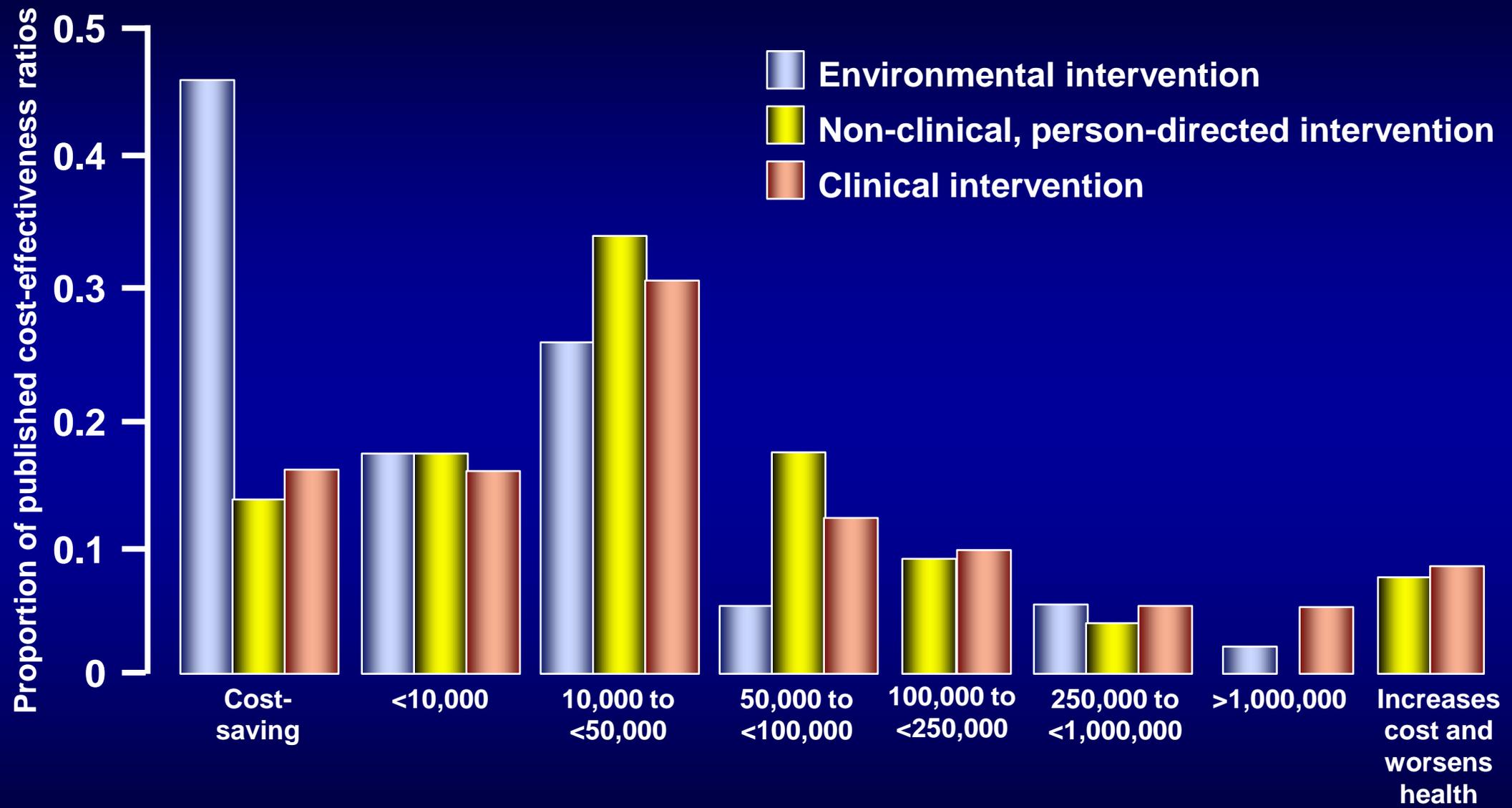
Untreated BP <120/80 mmHg

Untreated FBG <100 mg/dl



Roger Circ 2011; 123: 459-463

Cost Effectiveness of Preventive Interventions



Taxation of Food and Drink

Sugar, rum and tobacco are commodities which are nowhere necessities of life, which are become objects of almost universal consumption, and which are therefore extremely proper subjects of taxation.

Adam Smith, The Wealth of Nations, 1776



AHA Policy Statement

Value of Primordial and Primary Prevention for Cardiovascular Disease

A Policy Statement From the American Heart Association

CV disease is preventable

**“Life-long Rx likely to
be cost-effective and
often cost saving”**

Circulation 2011;124:967-990

**“It should be the
function of
medicine to have
people die **young**
as late as possible”**

Ernest L. Wynder M.D.

