

State of the Art:
**Environmental determinants of
blood pressure**

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Declaration of Interest

- Received honoraria from Boeringher-Ingelheim, Lilly and EMRO Region of WHO.
- Unpaid member of CASH, WASH, UK Health Forum, and Trustee of the Student Heart Health Trust (all charitable organizations).
- Unpaid technical consultant to NICE, the World Health Organization (Geneva, Copenaghen) and the European Salt Action Network.



Outline

- What is 'hypertension'?
- How common is it in the world?
- Why is it important globally?
- How does the risk due to hypertension compare to other risk factors?
- When is blood pressure considered 'normal'?
- What do we do to reduce the burden of hypertension?
- What is being done globally?
- Does it work?
- Is it worth it?



What is 'hypertension'?

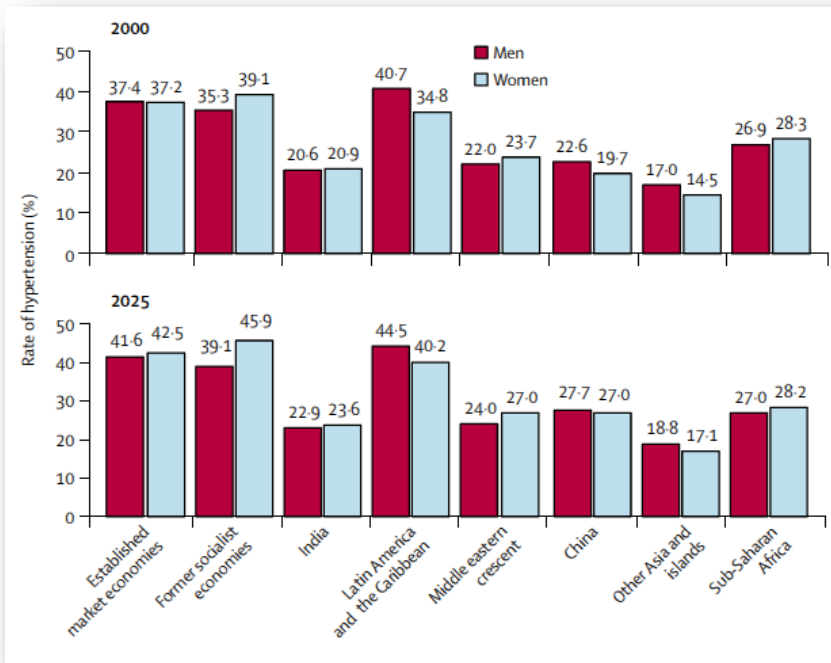
Hypertension a blood pressure level above which investigation and treatment do more good than harm

G Rose 1971



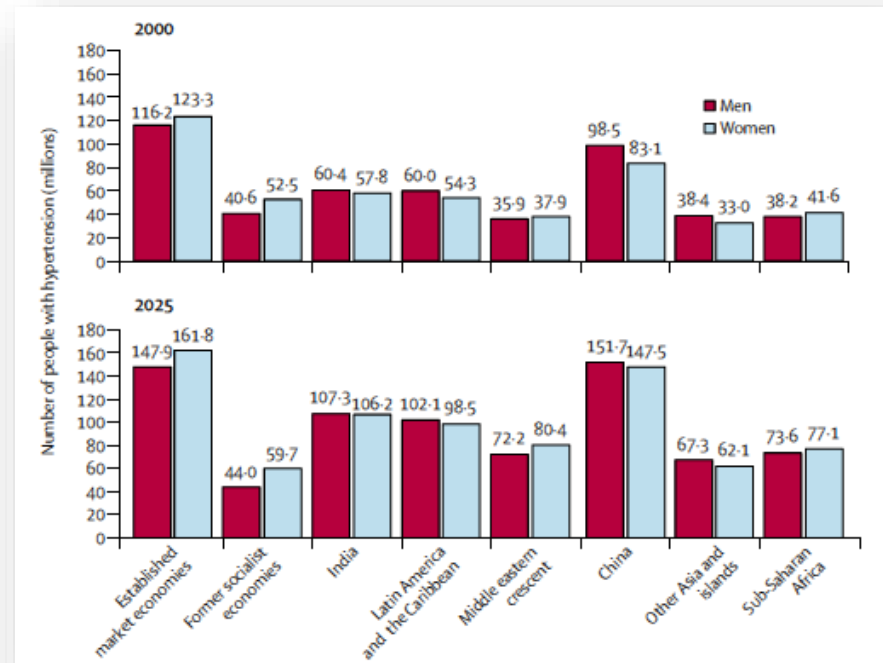
How common is 'hypertension'?

Prevalence (%)



Overall: 26.4% in 2000
Projected: 29.2% in 2025

Number of adults (millions)



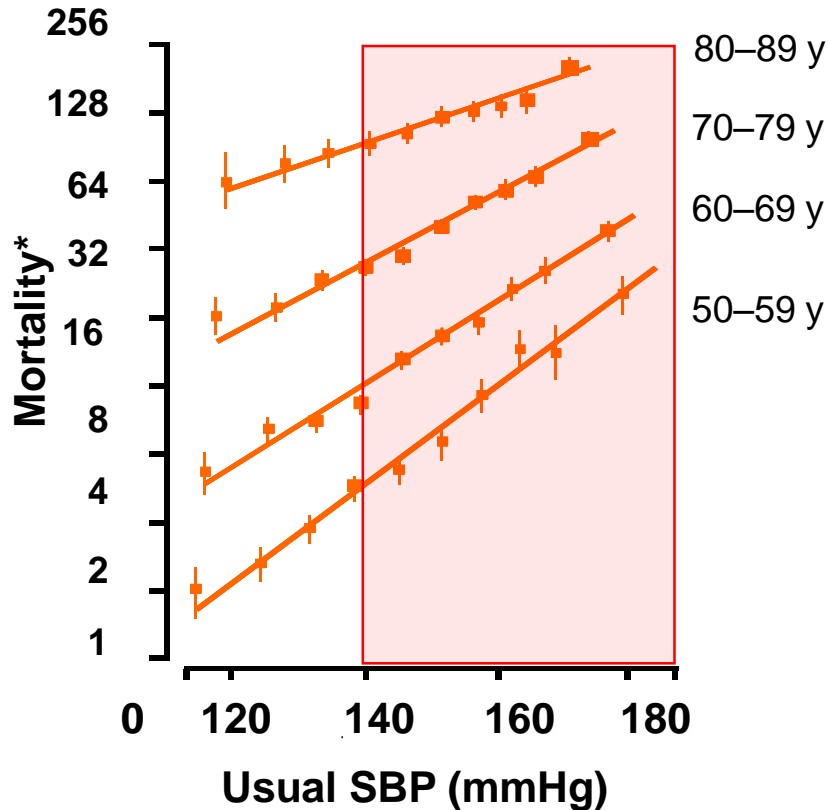
Overall: 972m in 2000
Projected: 1.56m in 2025

Kearney PM et al. Lancet 2005; 365:217-23

Why is 'hypertension' important globally?

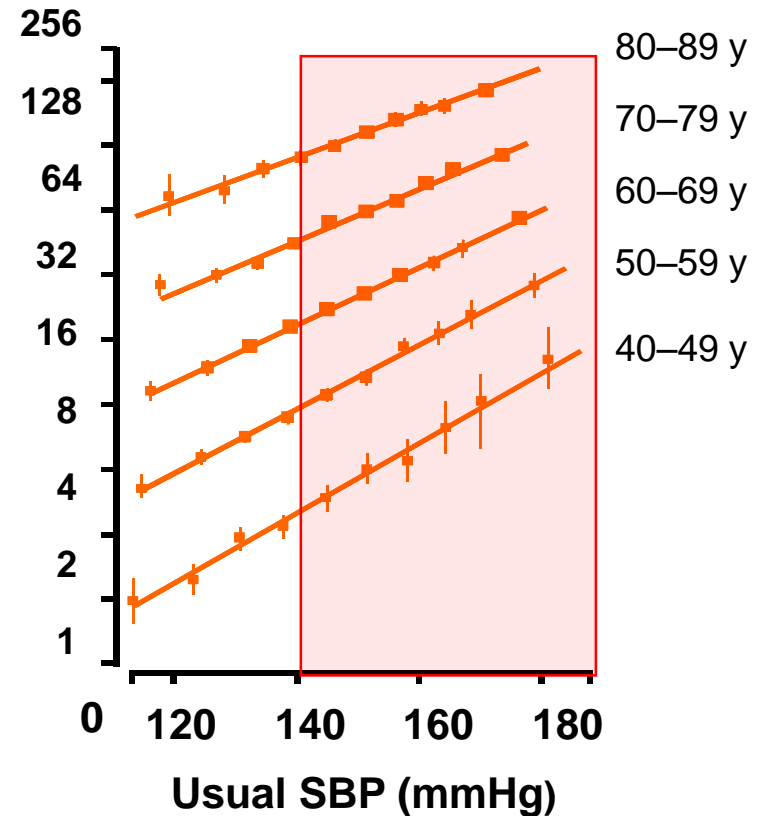
Stroke

Age at risk



CHD

Age at risk

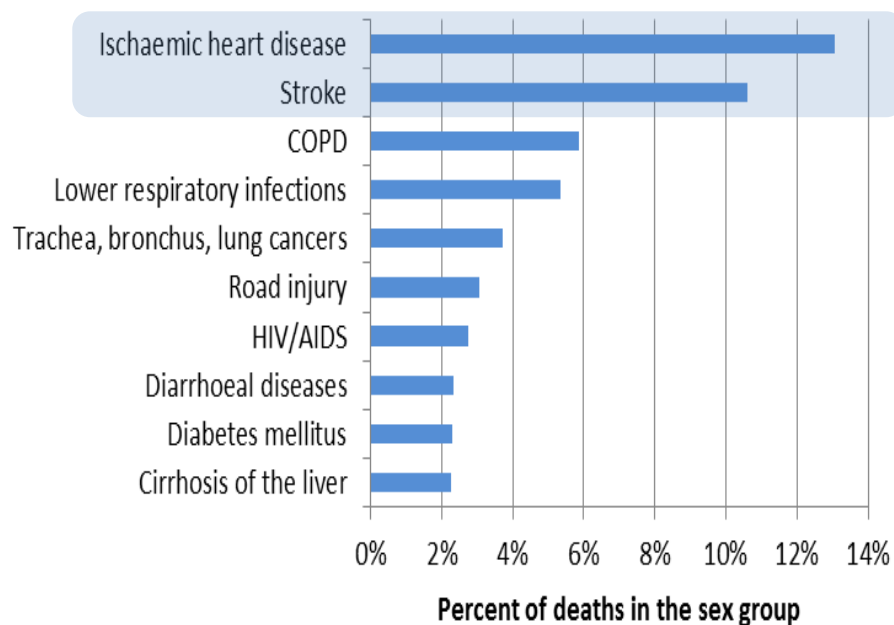


Lewington et al. Lancet 2002;360:1903-13

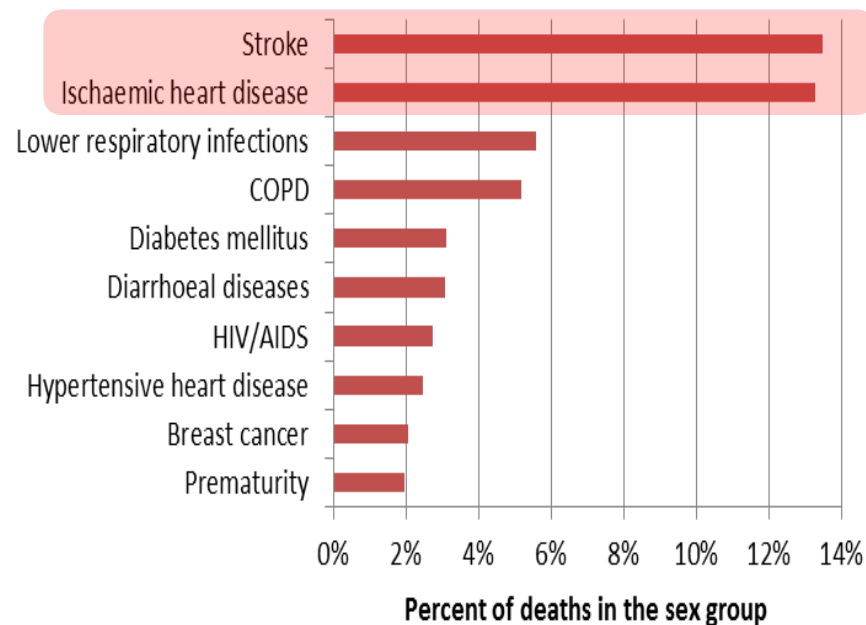


The 10 Leading Causes of Death by Sex, Global, 2012

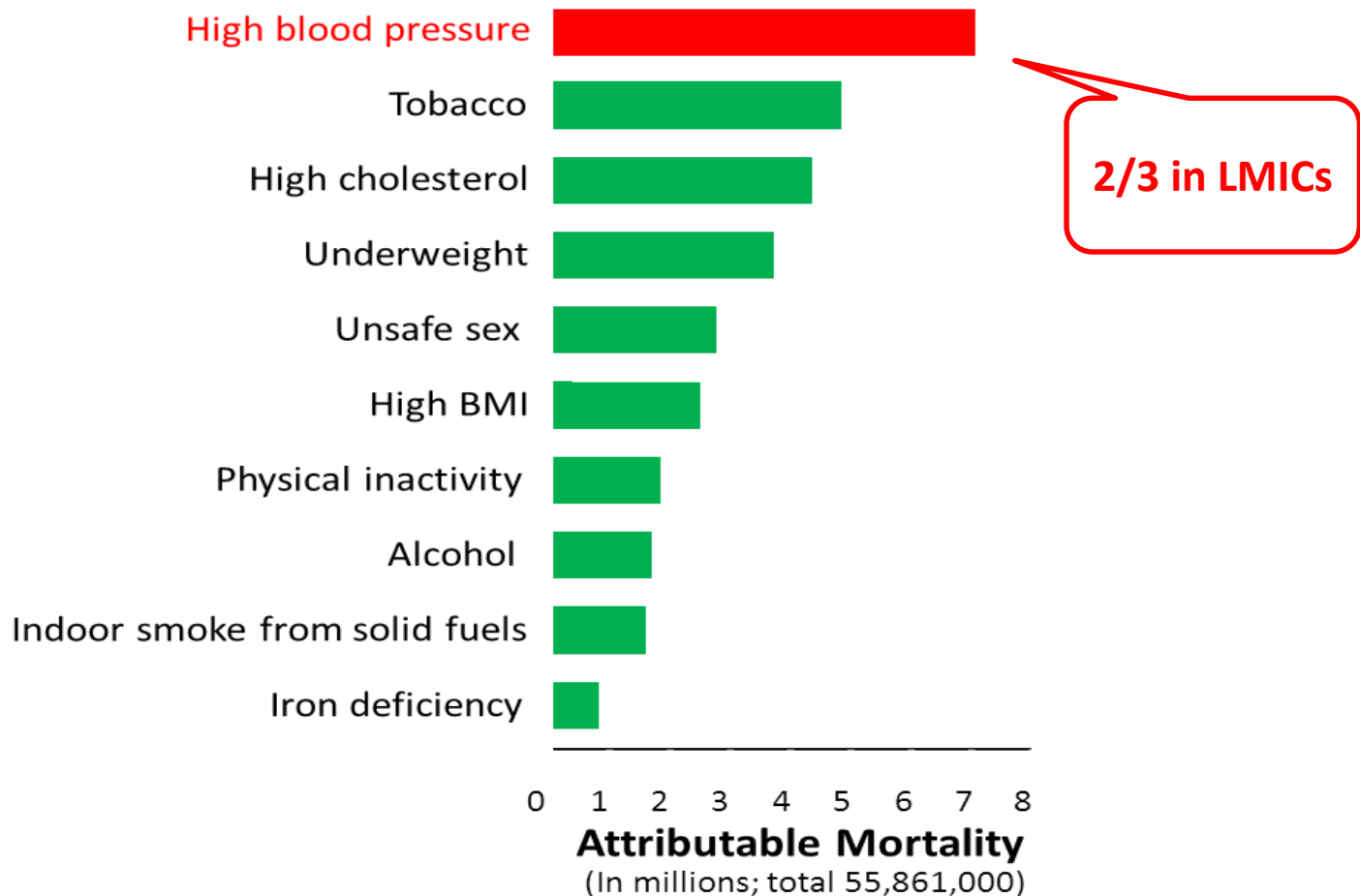
Male



Female



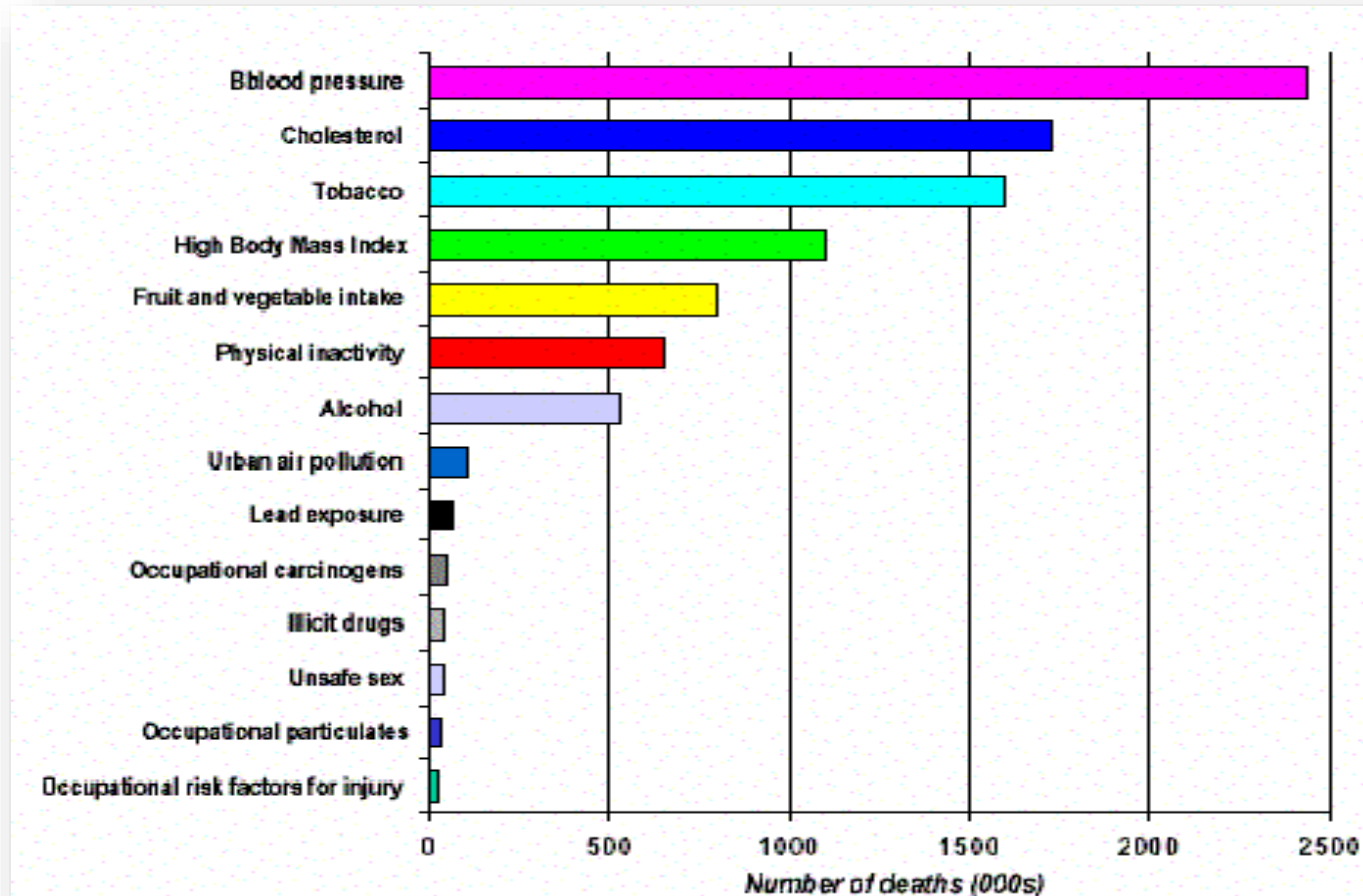
How does the risk due to hypertension compare to other risk factors globally?



Lopez et al. Lancet 2006;367:1747-57



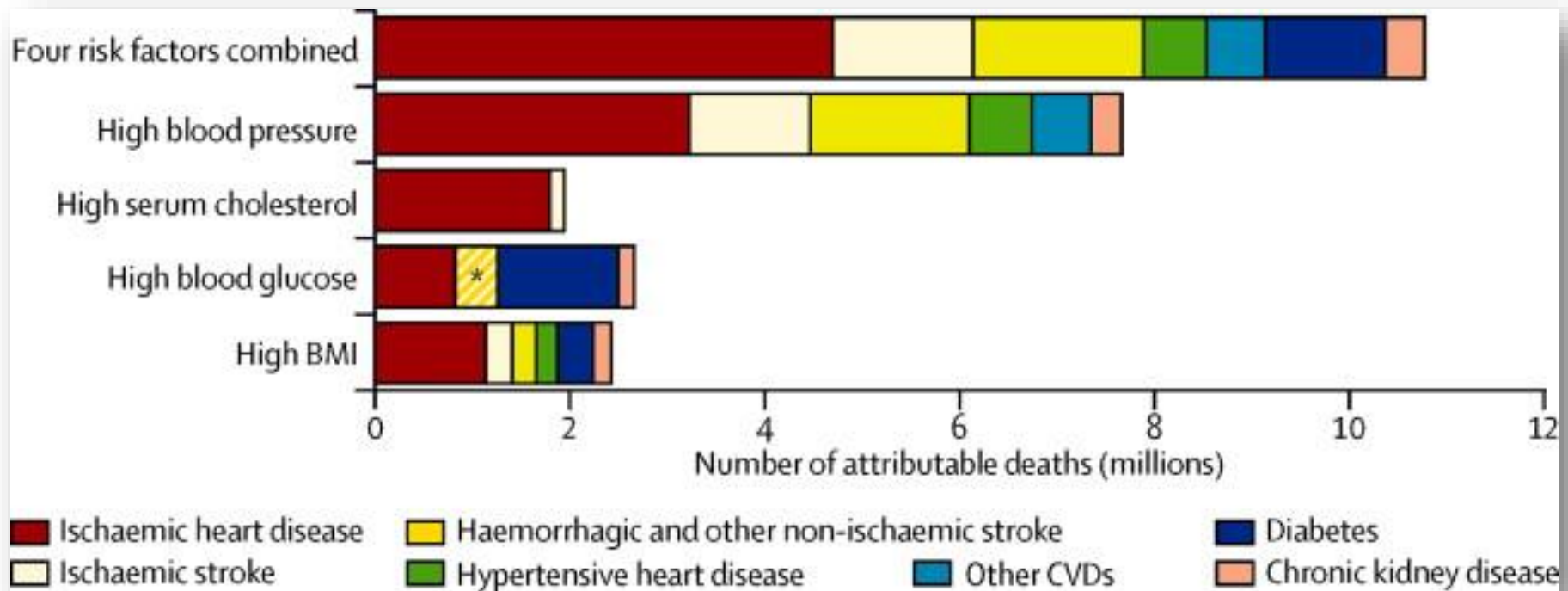
Proportion of deaths attributable to leading risk factors in Europe (2000)



~2.5M



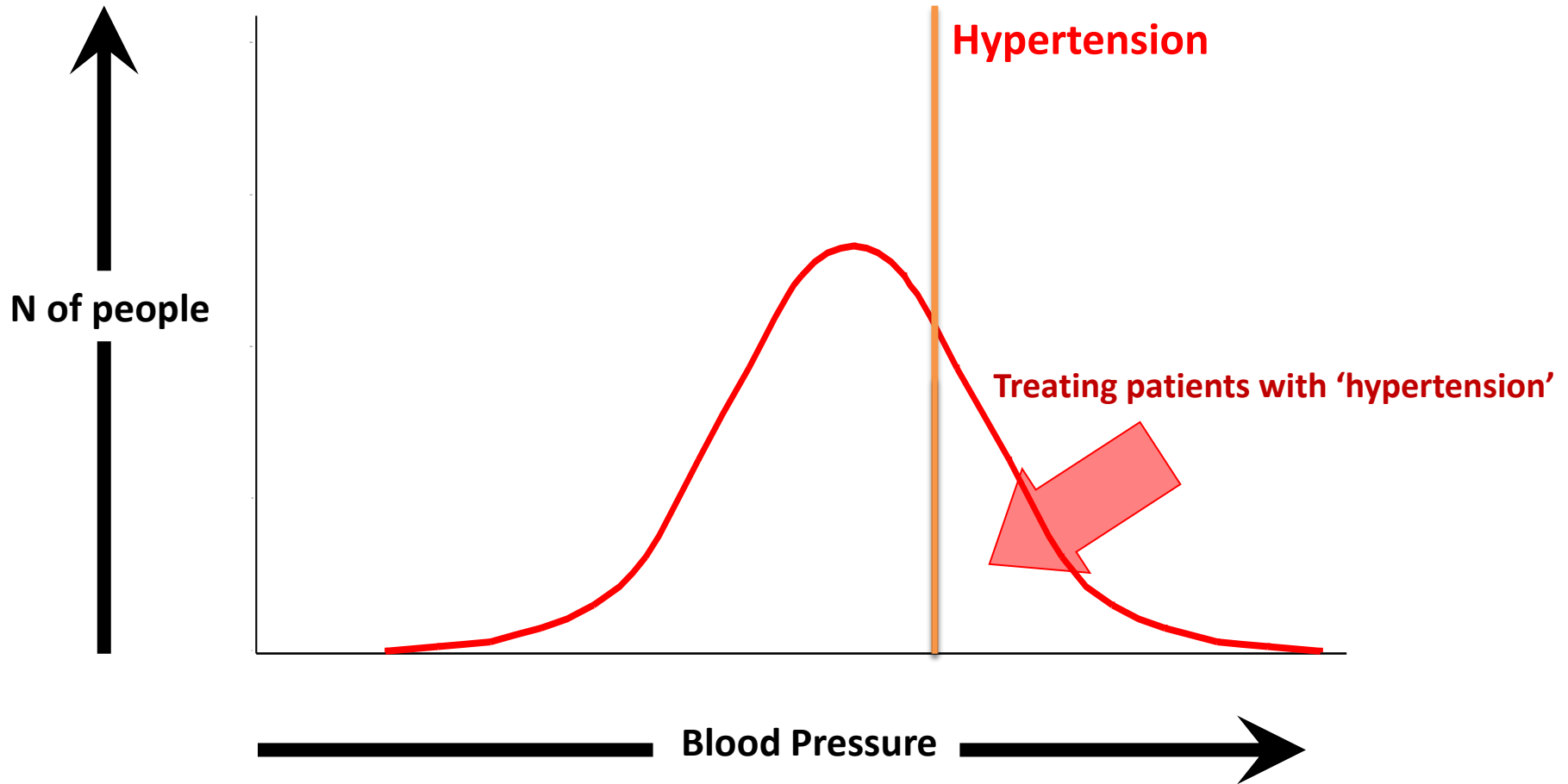
Deaths attributable to the individual and combined effects of high BMI, blood pressure, serum cholesterol, and blood glucose in 2010, by disease



Global Burden of Disease. Lancet Diab Endocrinol 2014; 2: 634-47

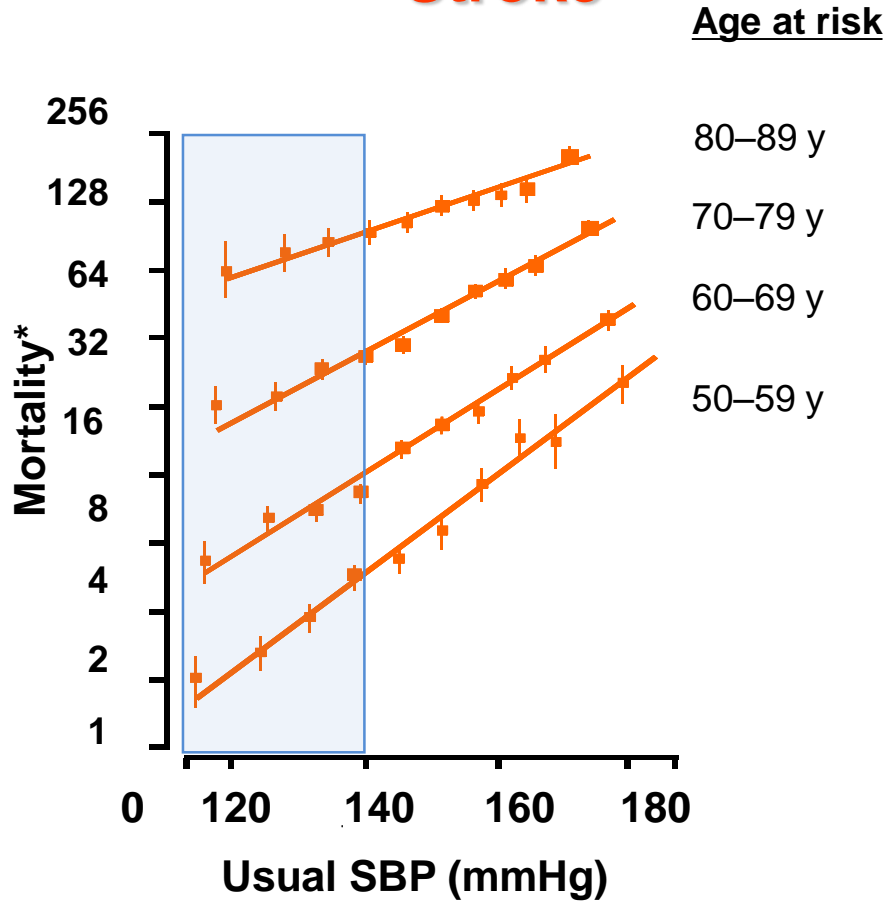
When is blood pressure considered normal?

'High risk' strategy

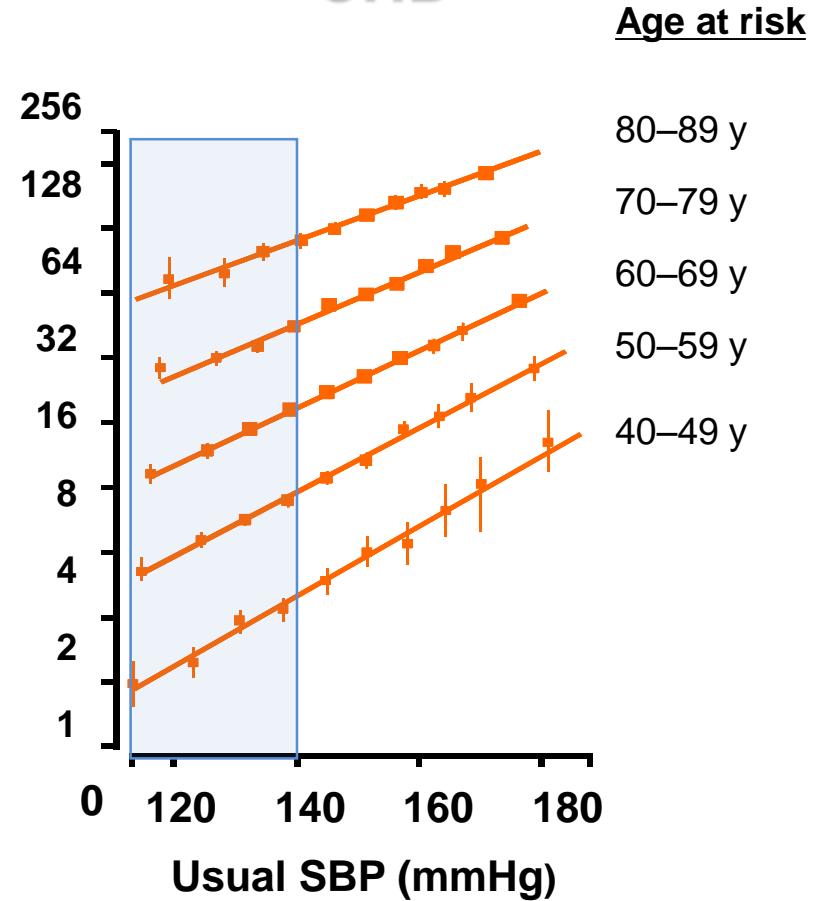


When is blood pressure considered normal?

Stroke



CHD

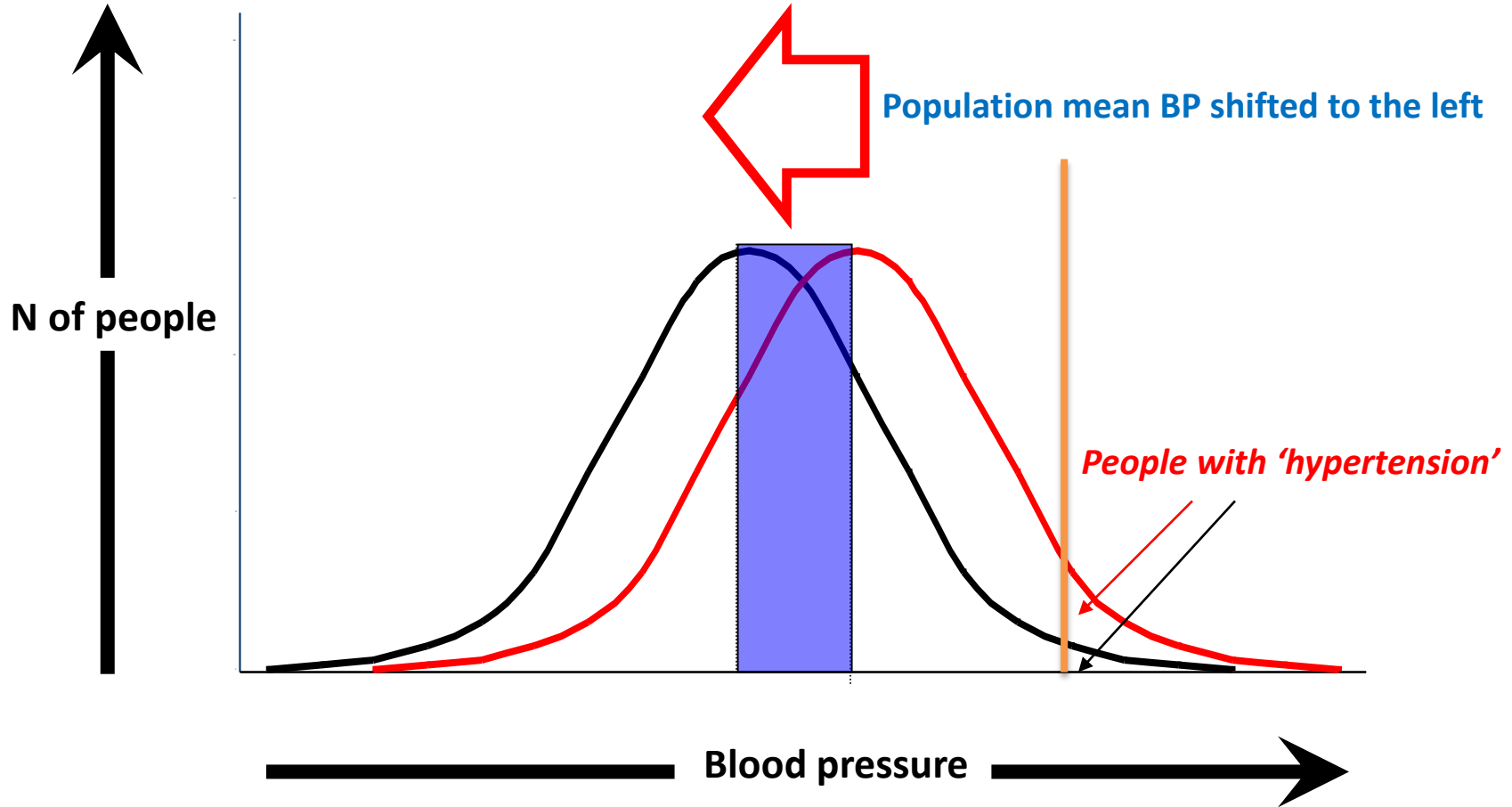


Lewington et al. Lancet 2002;360:1903–13



When is blood pressure considered normal?

Population strategy



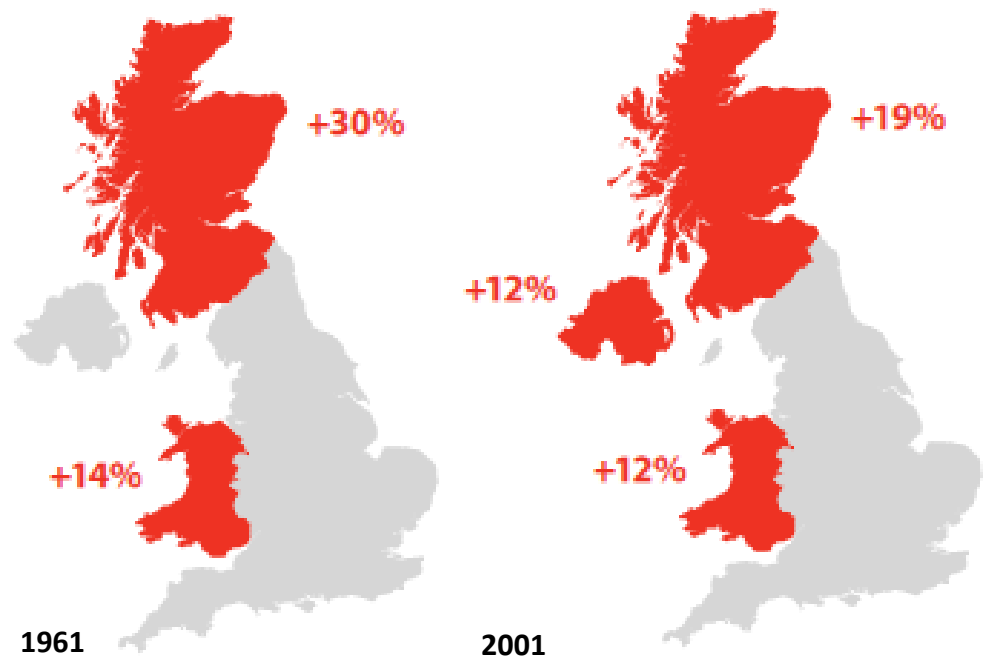
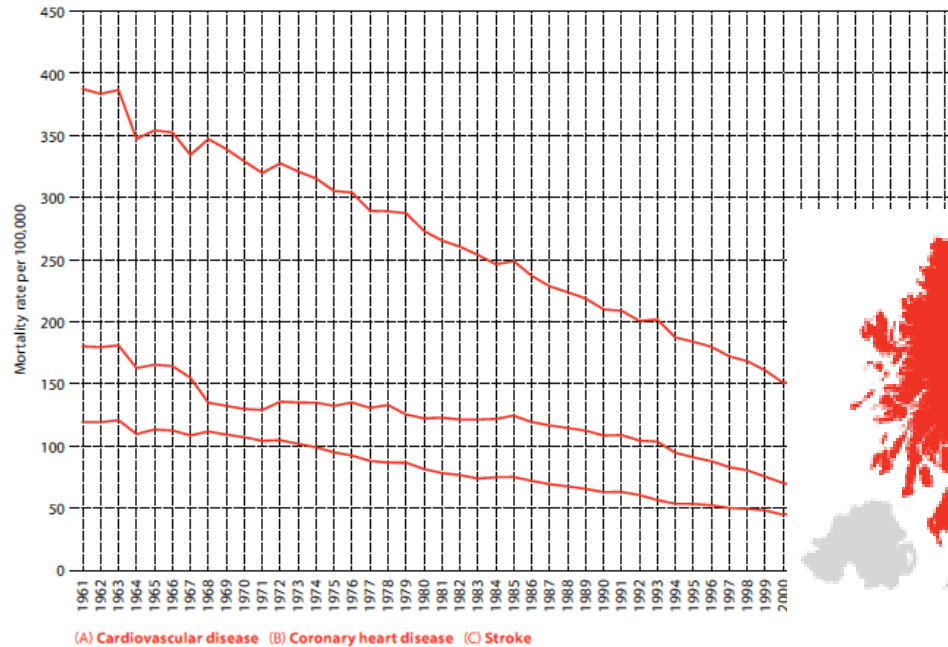
What do we do to reduce the burden of hypertension and CVD globally?

- Prevention
 - Primordial (eg. change environment)
 - Primary (eg. target determinants/risk factors)
 - Secondary (avoid recurrence)
- Treatment
 - Pharmacological
 - Interventional



Premature mortality from cardiovascular disease in Great Britain

Age-standardised mortality rates for cardiovascular diseases, men under 75, 1961 to 2009, Great Britain



British Heart Foundation (2011)



Figure 3.1
Prescriptions used in the prevention and treatment of CVD, selected BNF paragraphs, 1981 to 2008, England

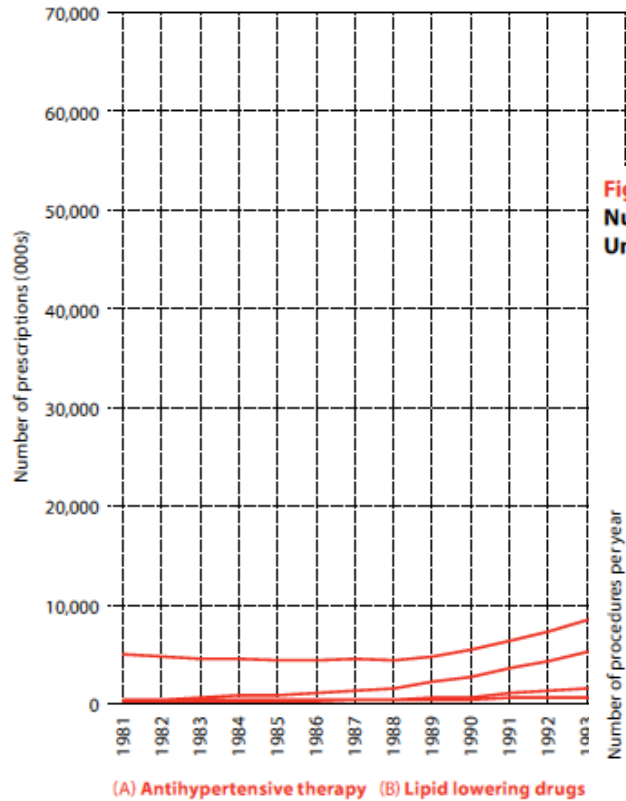
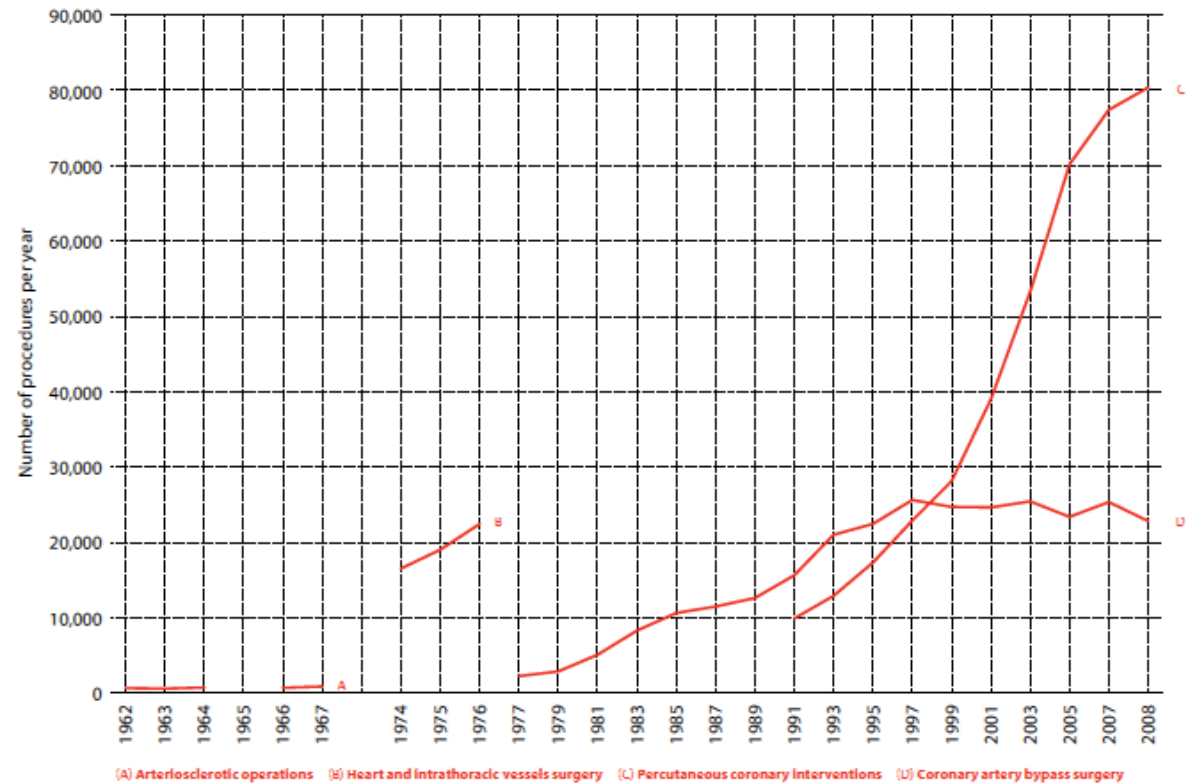


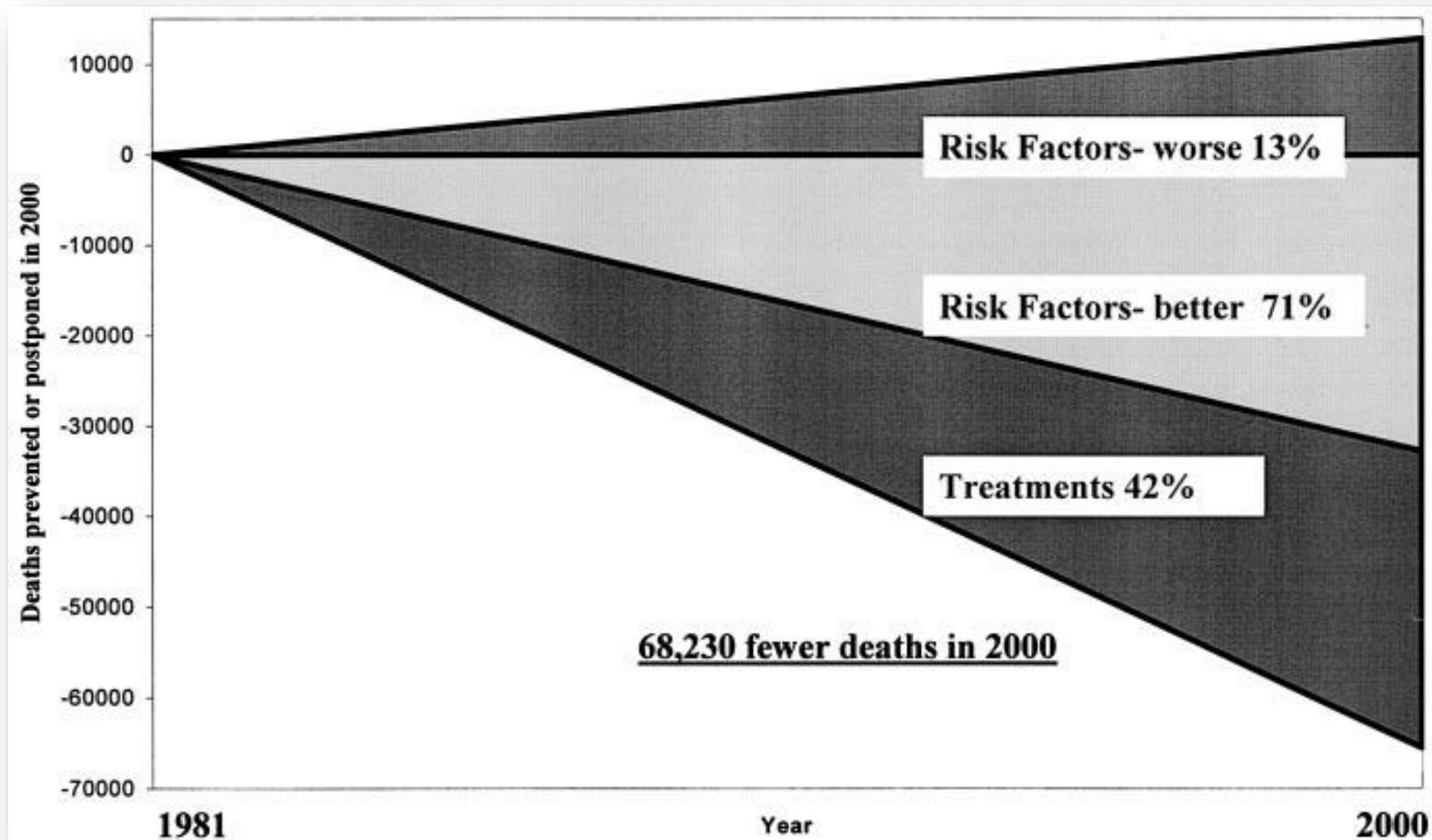
Figure 3.2
Number of operations for coronary heart disease 1962 to 1976, England and Wales, 1977 to 2008, United Kingdom



British Heart Foundation (2011)



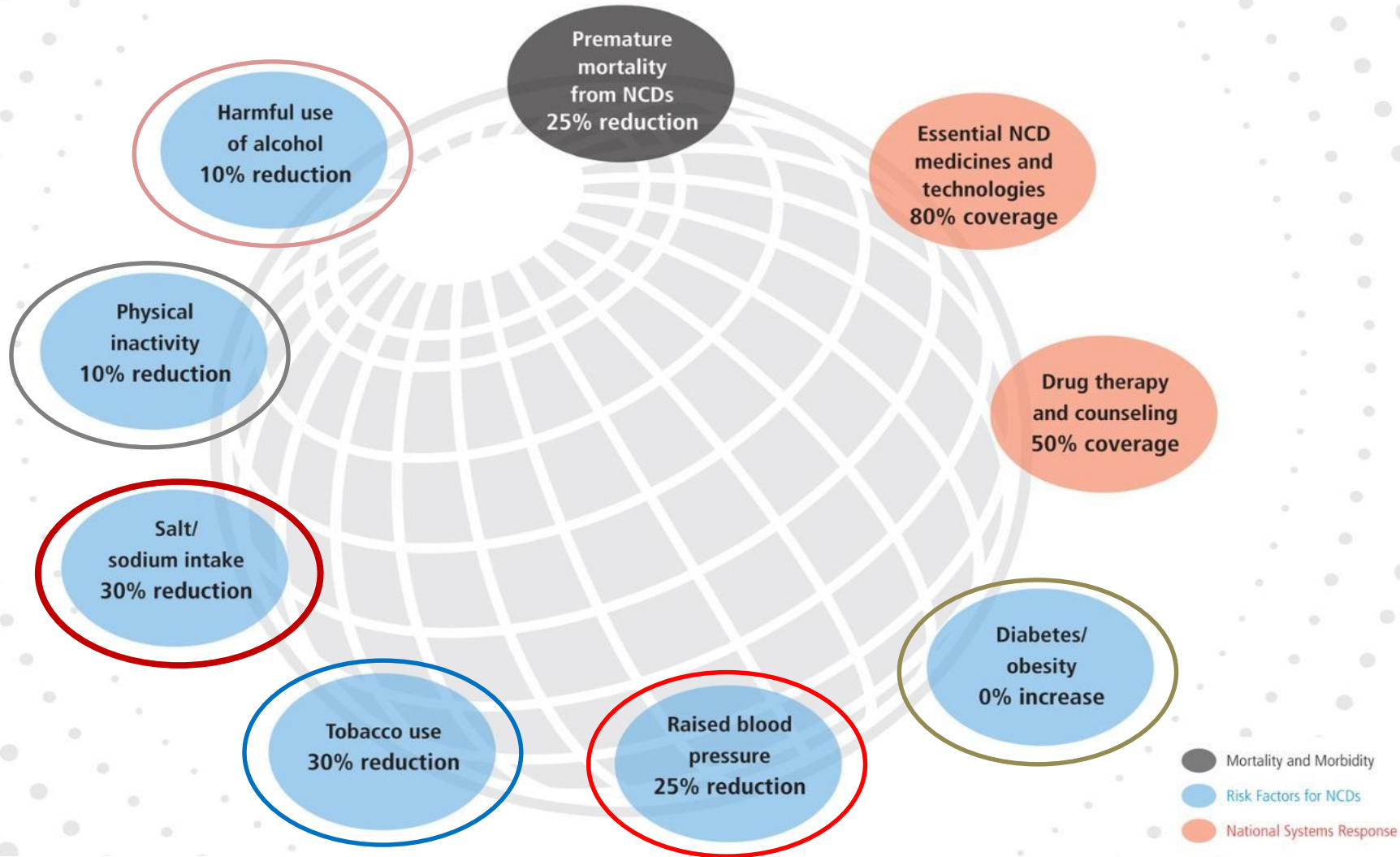
CHD deaths prevented or postponed by treatments and risk factor changes in E&W population, 1981 to 2000



Unal B et al. Circulation 2004;109:1101-7



What is being done globally?



UN-WHO: World Health Assembly, 2010

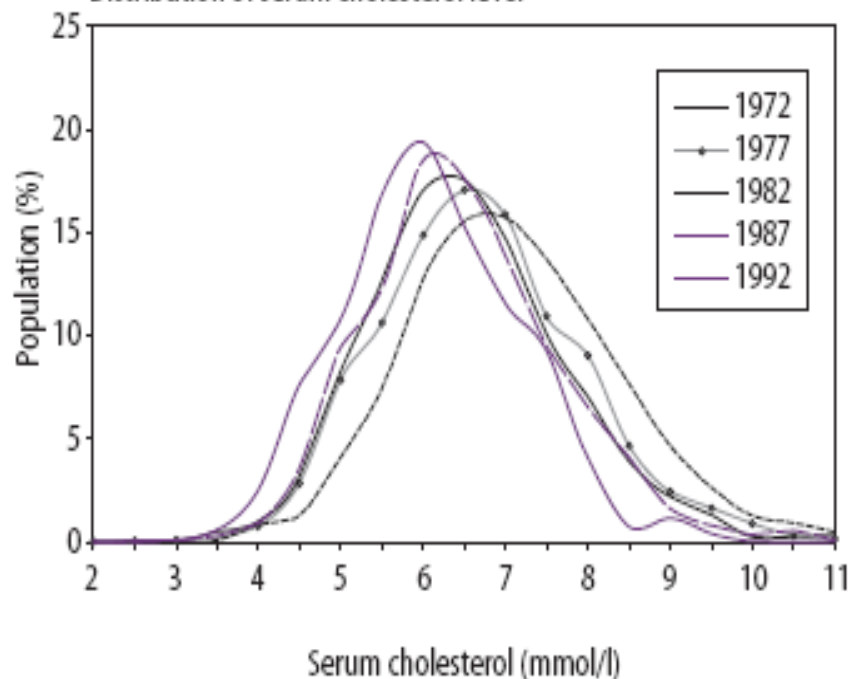


Does it work?

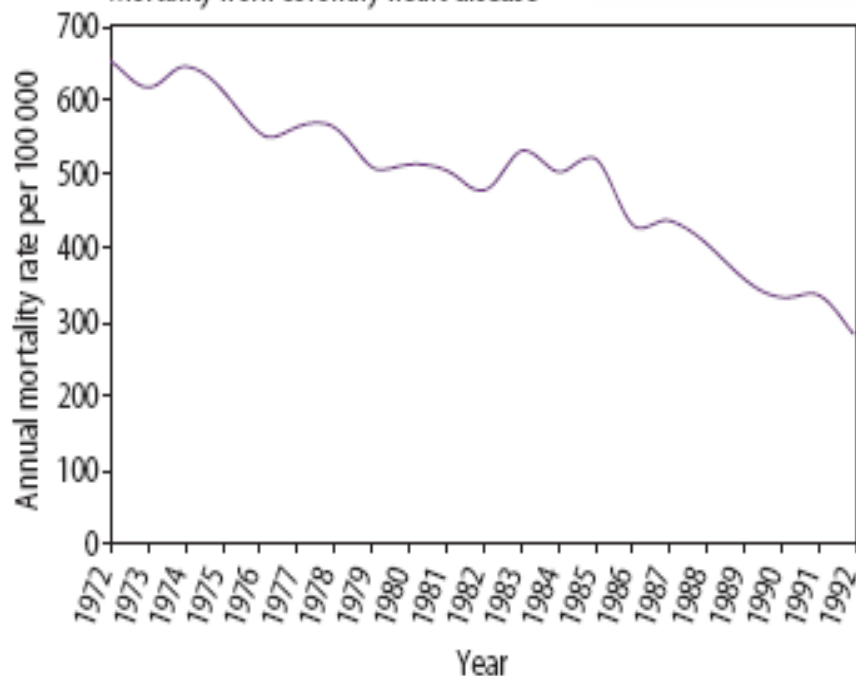
North Karelia Project Finland



Distribution of serum cholesterol level

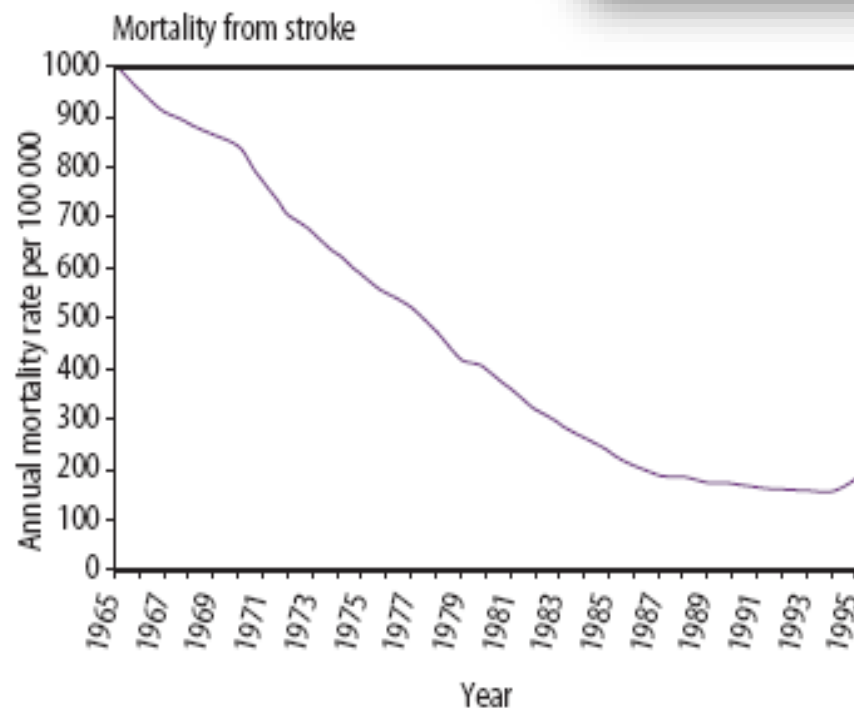
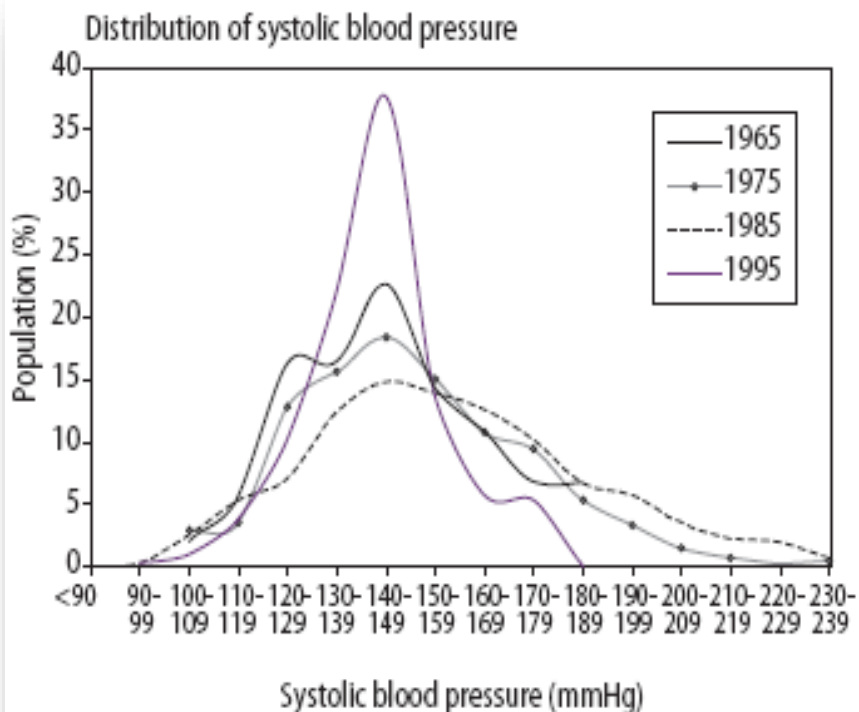


Mortality from coronary heart disease

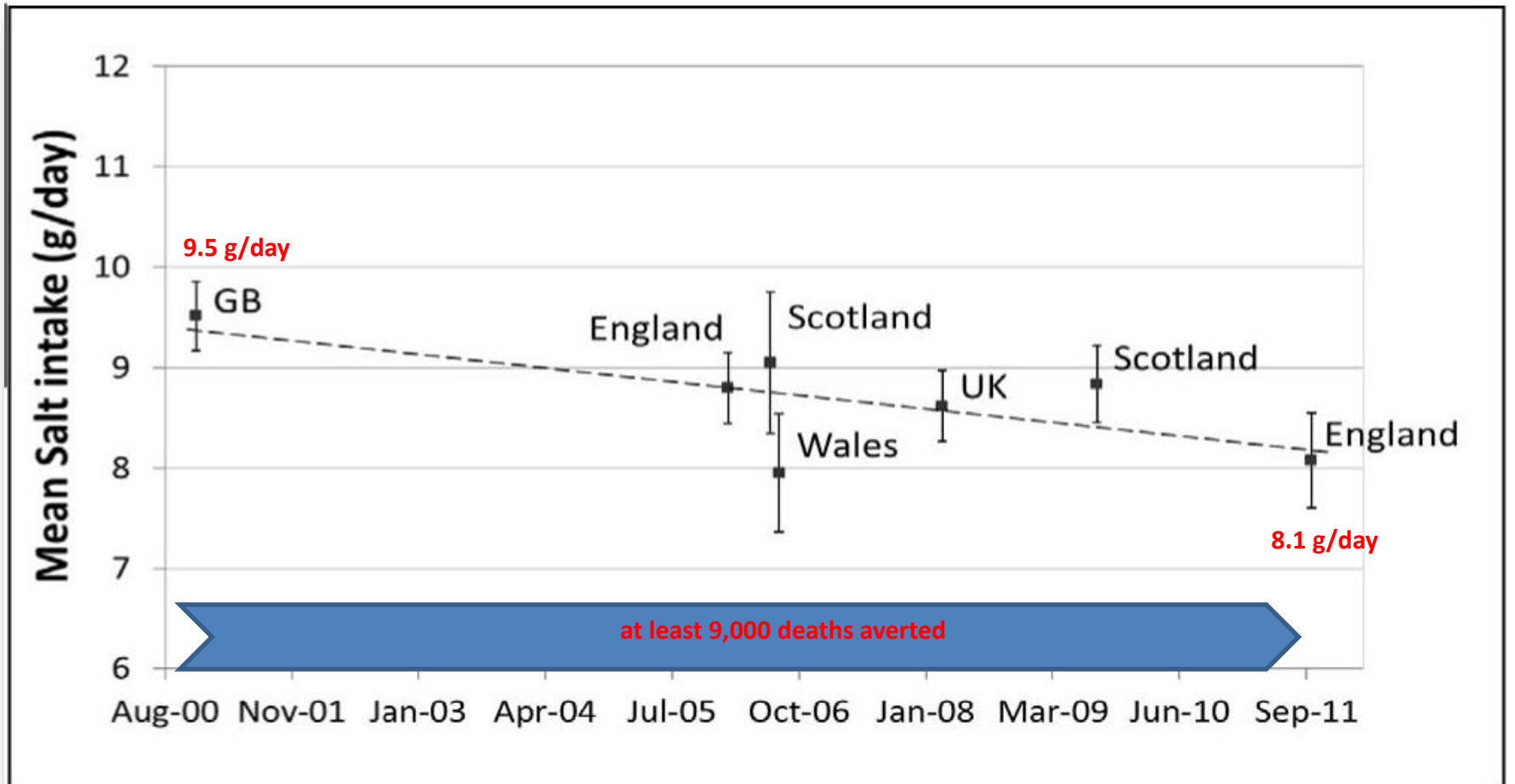


Does it work?

Blood Pressure and Stroke Japan



Salt intake reduced by 1.4 g/day in the UK between 2000 and 2011



Is it worth it globally?

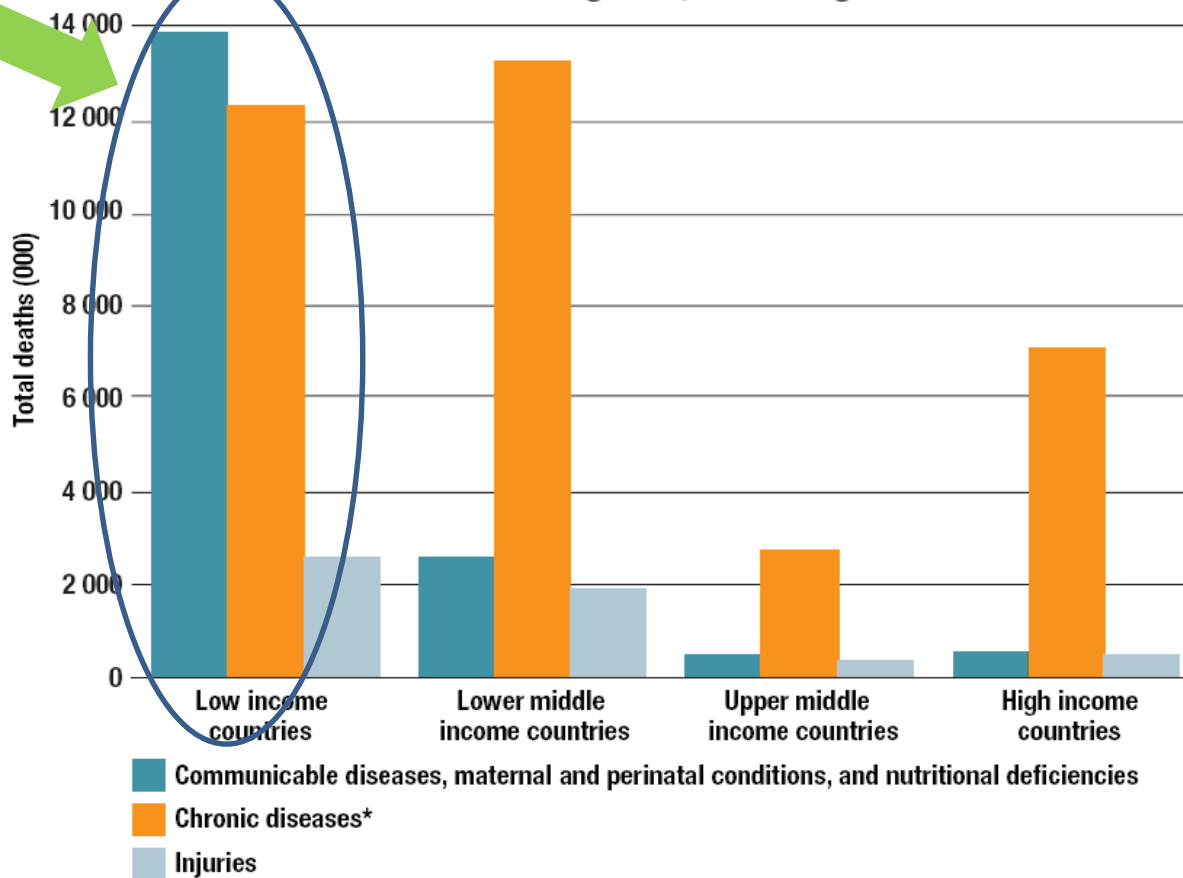
EVERY YEAR:

- 4.9m people die from tobacco use
- 2.6m people die from being overweight or obese
- 4.4m people die as a result of raised total cholesterol levels
- 7.1m people die as a result of raised blood pressure
- At least twice as many suffer permanent disabilities



Projected deaths by major cause and World Bank income group, all ages, 2005

Double burden



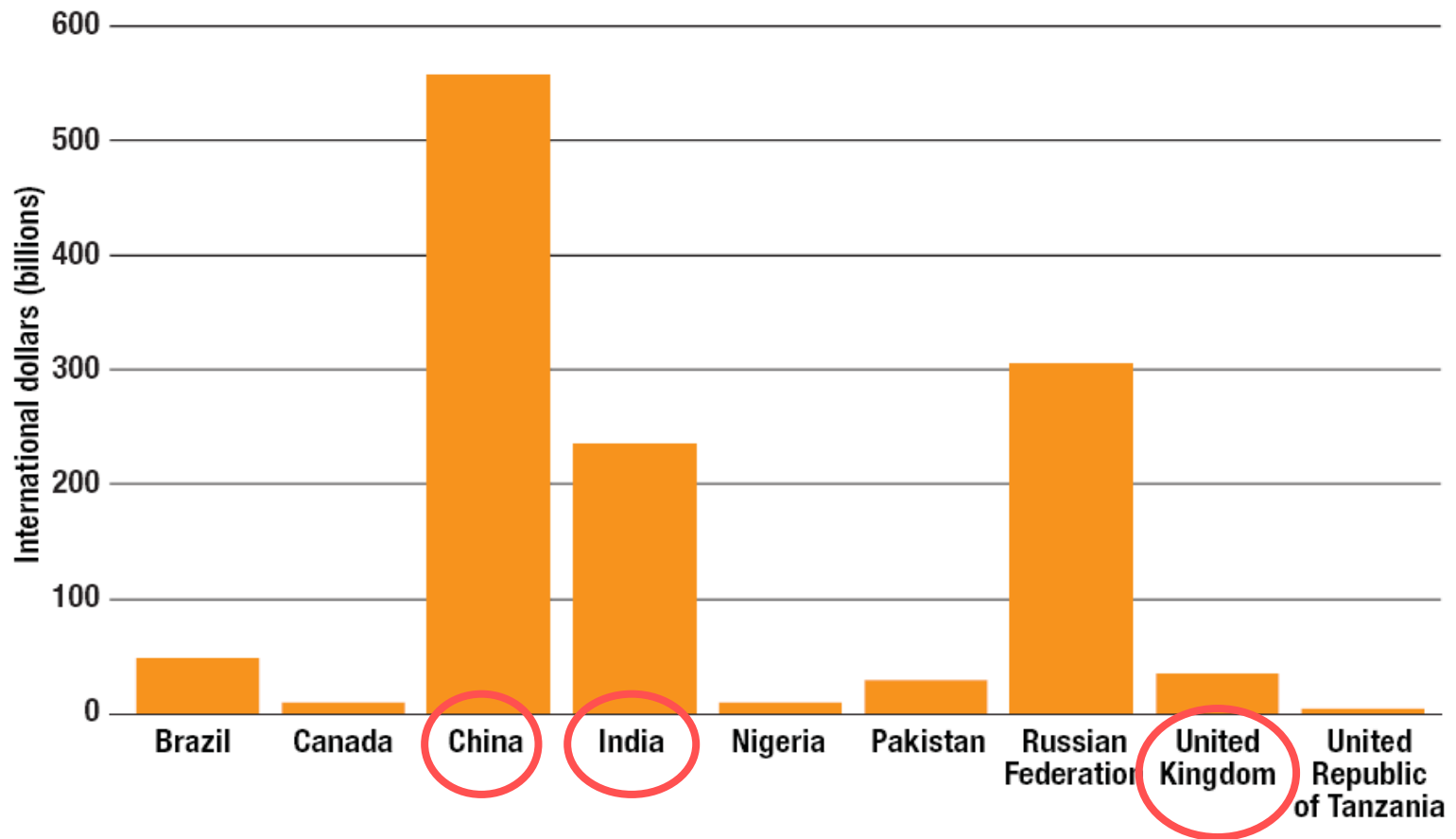
* Chronic diseases include cardiovascular diseases, cancers, chronic respiratory disorders, diabetes, neuropsychiatric and sense organ disorders, musculoskeletal and oral disorders, digestive diseases, genito-urinary diseases, congenital abnormalities and skin diseases.

Source: World Bank



Projected foregone national income

due to heart disease, stroke and diabetes
in selected countries, 2005–2015



Source: World Bank



Conclusions

- High blood pressure is a leading determinant of CVD, the biggest killer globally.
- The rise in blood pressure is preventable with population-wide strategies.
- ‘Hypertension’ is easily detectable and treatable.
- Prevention and management of high blood pressure are highly cost-effective (often cost-saving) in all global settings.
- CVD reduction and hypertension control are United Nations and World Health Organization global priorities by 2025.

