



Quantifying Health Inequality Reduction Within a Cost Effectiveness Framework

**Methodological Work in Progress
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Background

- UK Public Health Research Consortium
 - Aims to strengthen the public health evidence base, with emphasis on tackling socioeconomic health inequality
 - 11 UK institutions funded by DH Policy Research Programme
 - Phase 1: 2005 to 2011 (Hilary Graham, York)
 - Phase 2: 2011 to 2016 (Mark Petticrew, LSHTM)
- This Methodological Project
 - April 2011 to April 2013
 - Analytical framework (for workshop 1, March 2012)
 - UK pilot studies (for workshop 2, January 2013)
- Future plans (from 2013)
 - Apply the framework to UK and non-UK case studies where strong effectiveness and distributional data are available

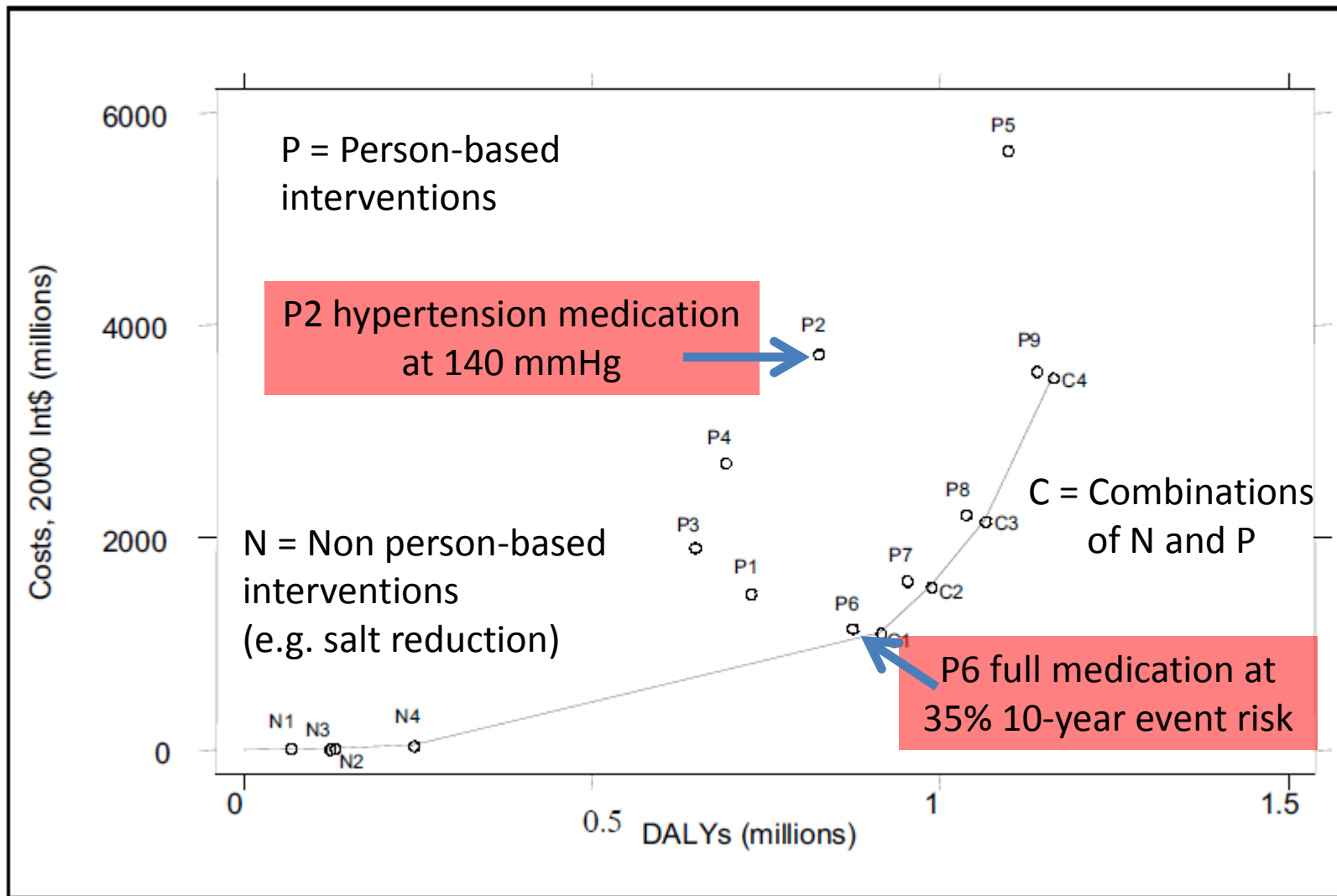
“HIAs should look at the impact of the policy on health and then the distribution of that impact of the policy on different groups... Changes to policy should then be made to enhance the distribution of positive impacts and minimise negative impacts on health, with the final judgement on fairness of particular impacts resting with democratically accountable decision makers, not a health impact assessor.”

Gunther, S. (2011). EU Joint Action on Health Inequalities ‘Equity Action’: *A rapid review of enhancing the equity focus on policy orientated Health Impact Assessment*

Why a cost effectiveness framework for quantifying health impacts?

- Because decision makers have to make hard choices about scarce resources and therefore need to know:
 1. The **SIZE** of health impact
 - Not enough to know: is the health impact +ve or -ve?
 - Need to know: how large is the health impact?
 2. The **NET** health impact
 - Health impact MINUS health opportunity cost
 - Decisions have health opportunity costs
 - Other ways of using resources can deliver health gains

Costs and health impacts of interventions to lower blood pressure and cholesterol in Europe



Source: Tan Torres et al. (2003) WHO Guide to Cost-Effectiveness Analysis

Methodology Project Objectives

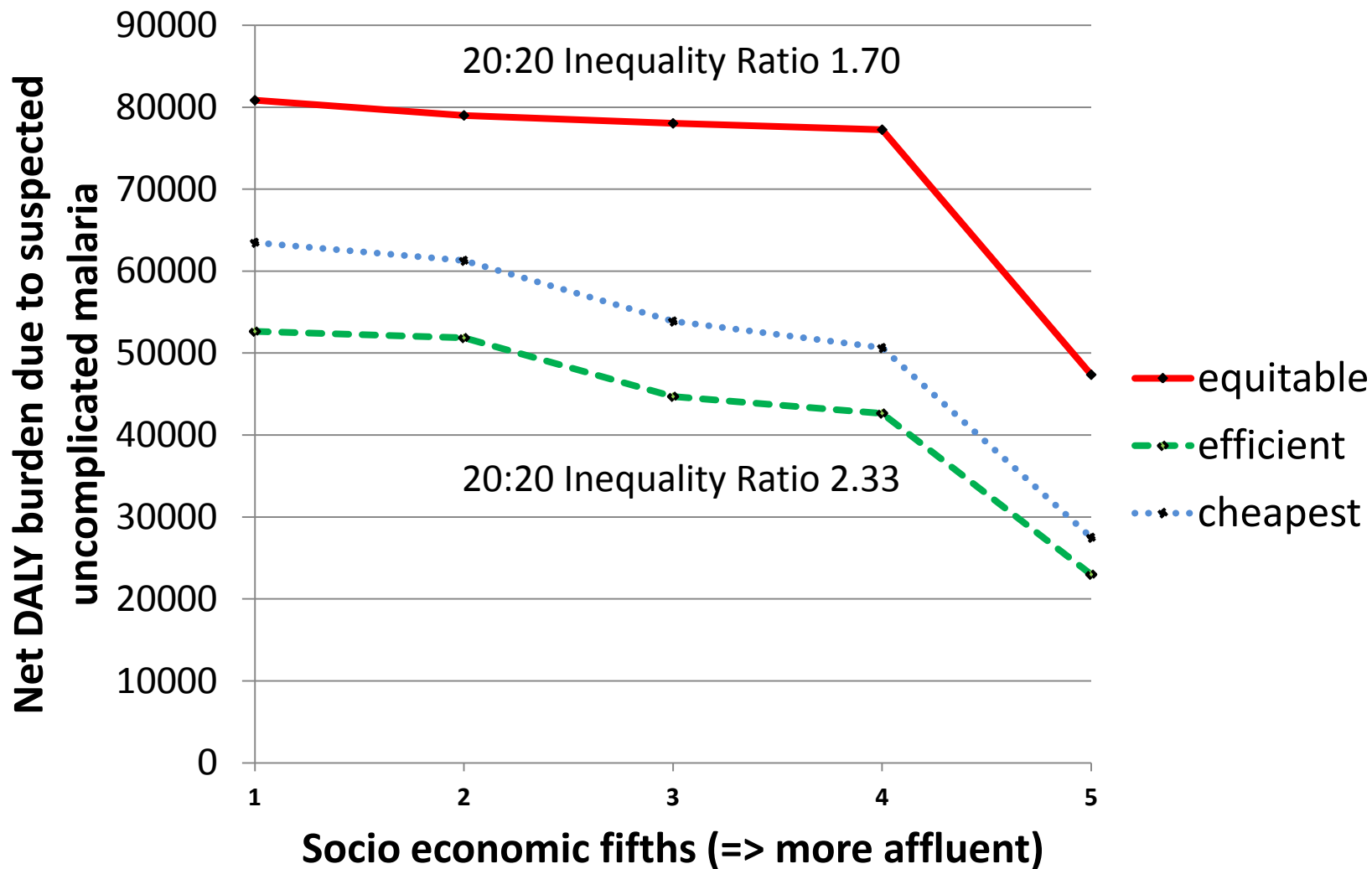
- To develop a general analytical framework for quantifying concerns about health inequality within a cost effectiveness framework
- To reflect decision makers' and stakeholders' concerns about health inequality within the context of a deliberative decision making process
- Initial focus on health sector policies for adults
 - e.g. early detection of bowel cancer
 - e.g. improved control of blood pressure and cholesterol
 - e.g. smoking cessation / reduction

Standard CEA is not enough because...

- Relatively cost effective policies may increase health inequality
 - e.g. lower uptake of and compliance with preventive care among more deprived populations
- Relatively cost ineffective policies may reduce health inequality
 - e.g. improving uptake and compliance among deprived populations may be costly but worthwhile to tackle health inequality

An example of “cost equality analysis”

Diagnosis and treatment strategies for suspected uncomplicated malaria in Africa



How to quantify trade-offs between cost effectiveness and inequality?

- Health opportunity cost
 - How much total population health is lost by choosing a programme that is not cost effective?
- Cost per unit reduction in health inequality
 - How much reduction in health inequality is achieved by choosing a programme that is not cost effective?
- Equity weighting
 - How much population health are members of the general public willing to sacrifice to reduce health inequality?

Cookson, R, Drummond, M and Weatherly, H. (2009)
"Explicit incorporation of equity considerations into economic evaluation of public health interventions" *Journal of Health Politics, Policy and Law*. 4: 231-45

Information provided in standard CEA

- Cardinal measure of health (QALY / DALY)
- Mean health benefit of intervention
- Expected health forgone from displaced activity (the cost effectiveness “threshold”)

Additional information required for “cost equality analysis”

1. Social distribution of health gains
 - Among recipients of the intervention
 2. Social distribution of opportunity costs
 - Among the general population
 3. Baseline social distribution of health
 - Among the general population
- (1) is not enough – need to know impact on health inequality in general population

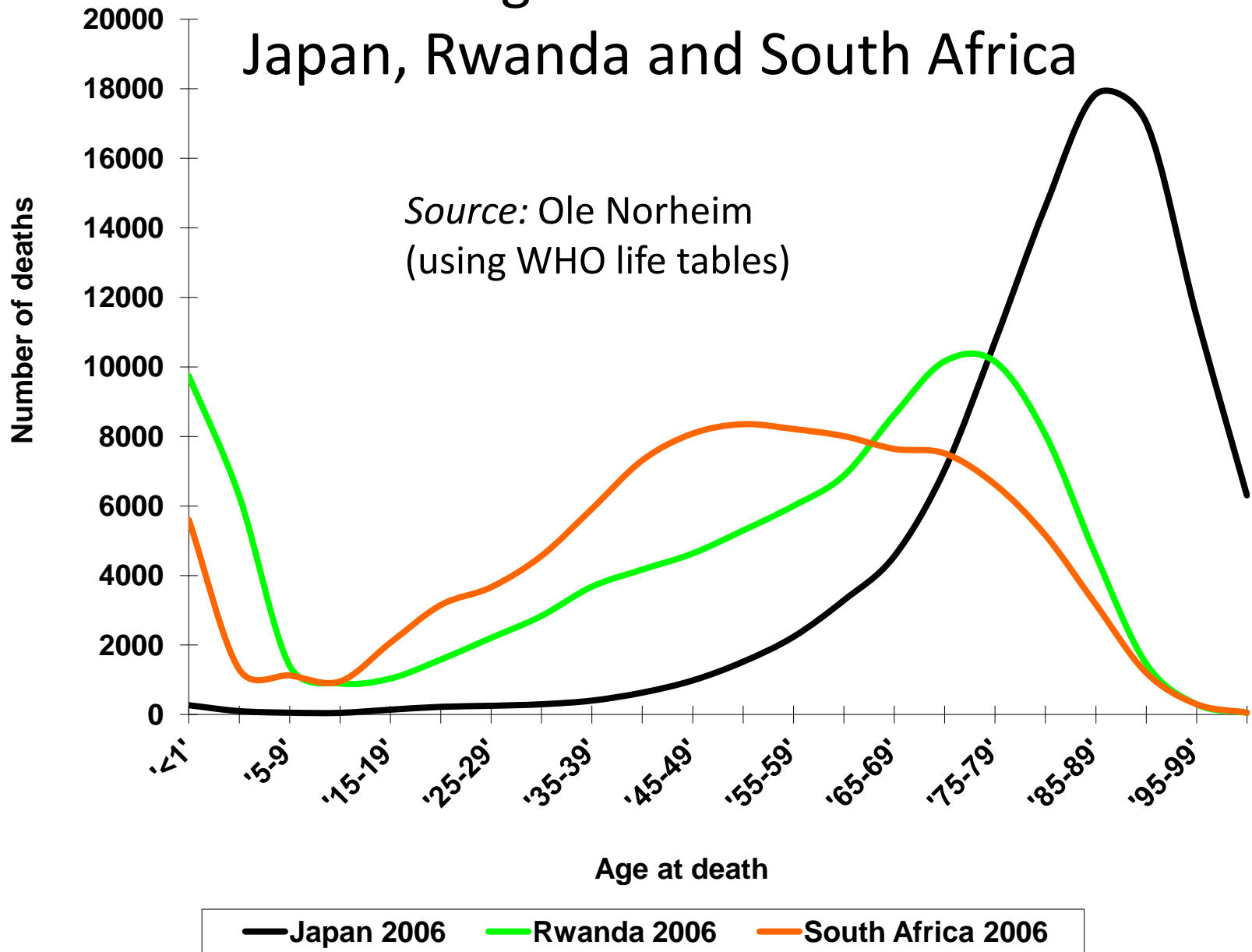
How to estimate the distribution of QALY opportunity costs?

- A “heroic” assumption: full equality
 - QALY losses of displaced programmes equally distributed between all social groups
- Possible alternative assumptions
 - e.g. proportional to current NHS expenditure
 - e.g. proportional to current health outcomes
- May be possible to estimate
 - e.g. data on health expenditure and outcomes

Conceptual issues in assessing how far health inequality is “unfair”

1. inequality vs. priority to the worst off
2. inequality in health vs. inequality in social determinants
3. absolute inequality (e.g. gaps) vs. relative inequality (e.g. ratios)
4. inequality between groups vs. inequality within groups
5. univariate health inequality (i.e. the overall dispersion of health) vs. bivariate health inequality (e.g. income-related inequality in health) vs. multivariate inequality (e.g. health inequality relating to multiple unfair social determinants of health)
6. avoidable vs. unavoidable health inequality
7. compensable vs. uncompensable health inequality (Hausman)
8. inequality of health vs. inequality of opportunity for health

Age at death in Japan, Rwanda and South Africa



Possible Decision Rule Benchmarks or “cost-equality thresholds”

- Axiomatic dominance tests from income inequality literature
 - But no guidance in “hard cases” involving trade offs between average health and health inequality
- Inequality index with particular inequality aversion parameter(s)
 - Average Health * (1 – Inequality Index)
- Equality ICER of other interventions
- Equality ICER of income redistribution
- Preference-based estimates

The challenge of inter-sectoral effects

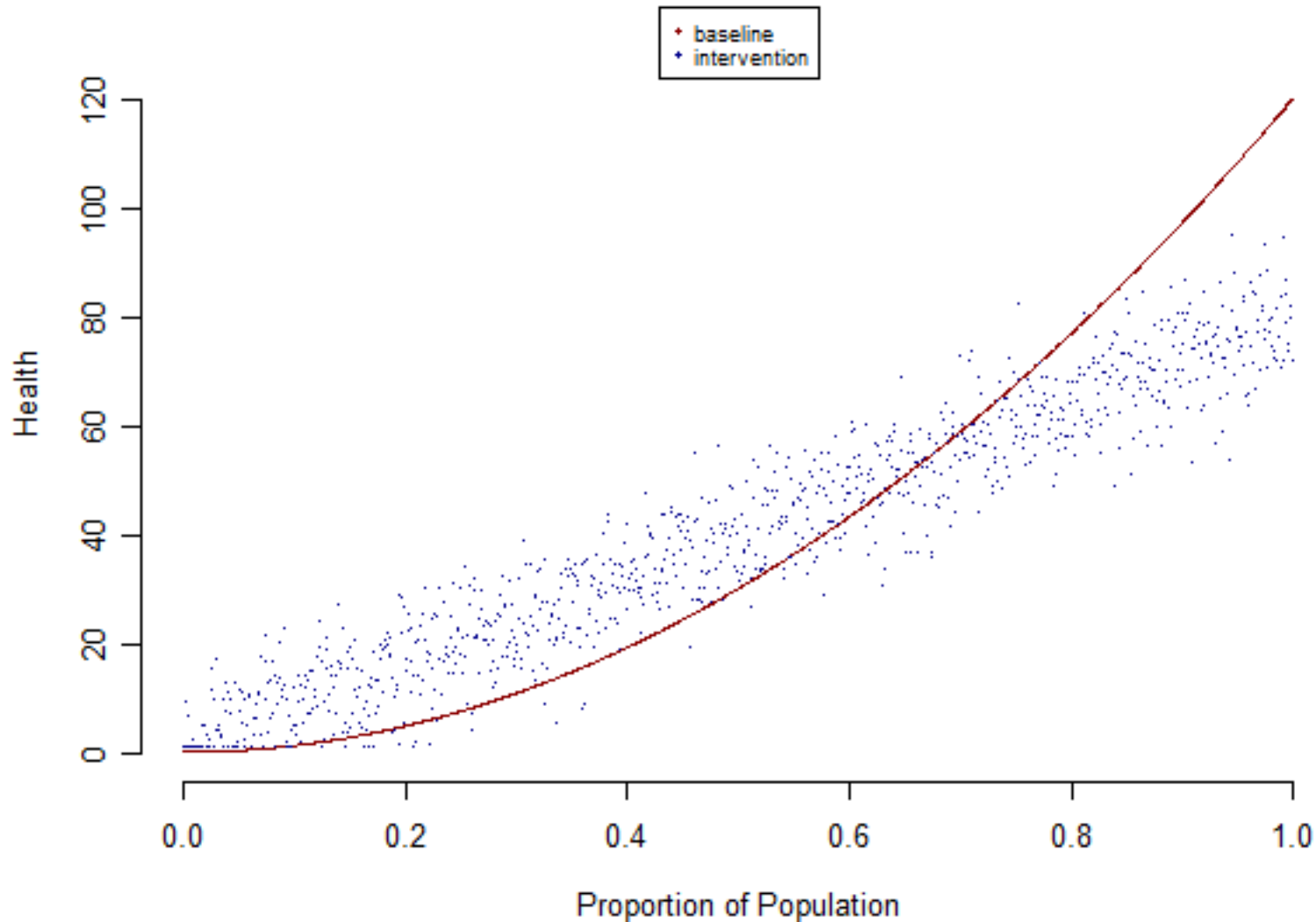
- Many policies with health inequality impacts have important non-health benefits (e.g. income, employment, education)
- Will need to expand our framework to incorporate non-health benefits (CEA to CBA)
- How to compare health inequality vs. income inequality?
 - e.g. taxes on alcohol, fatty food etc. may increase income inequality while reducing health inequality

Thank you

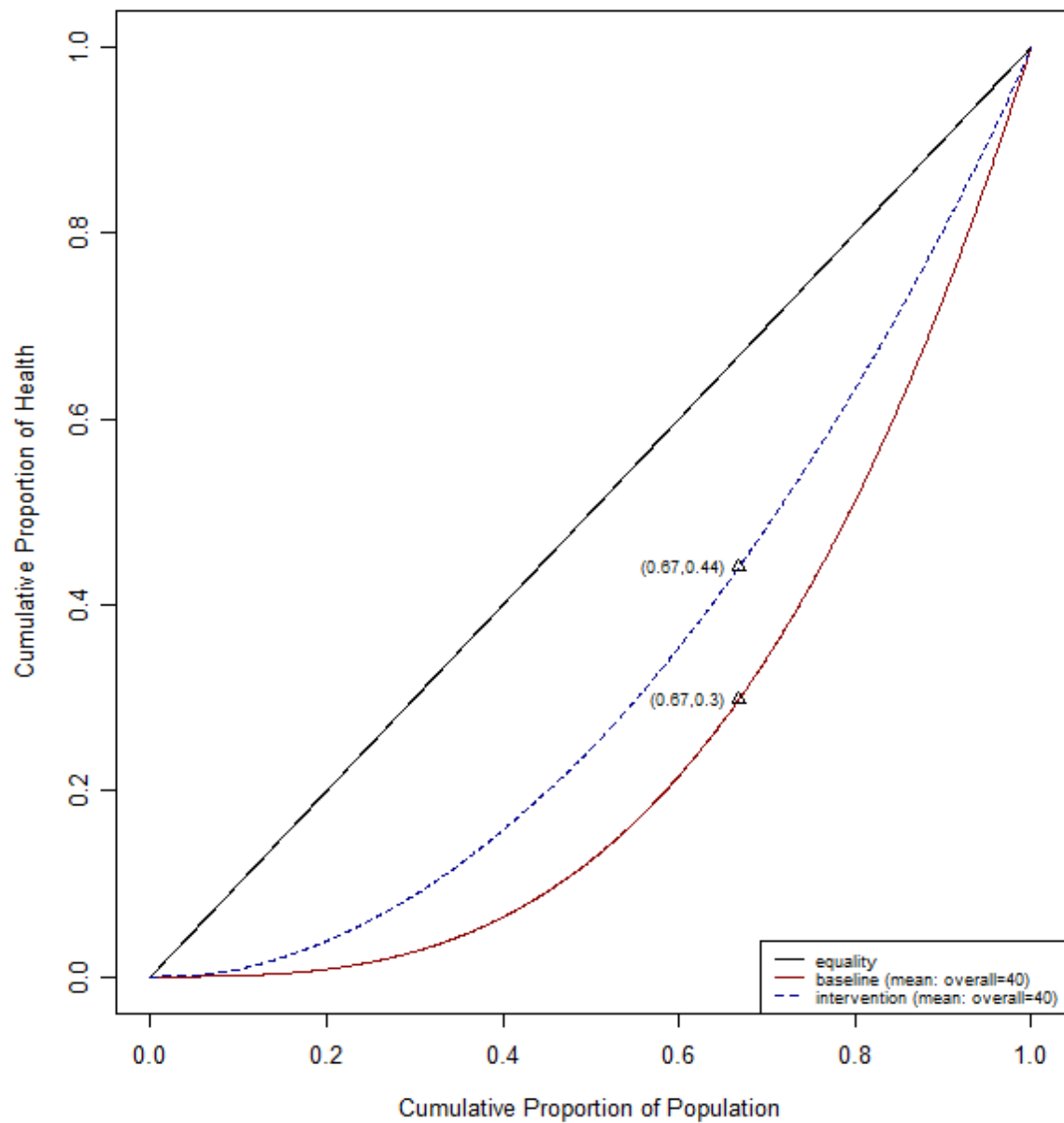
Additional slides

Hypothetical example of Atkinson Theorem dominance: same mean health, reduced health inequality

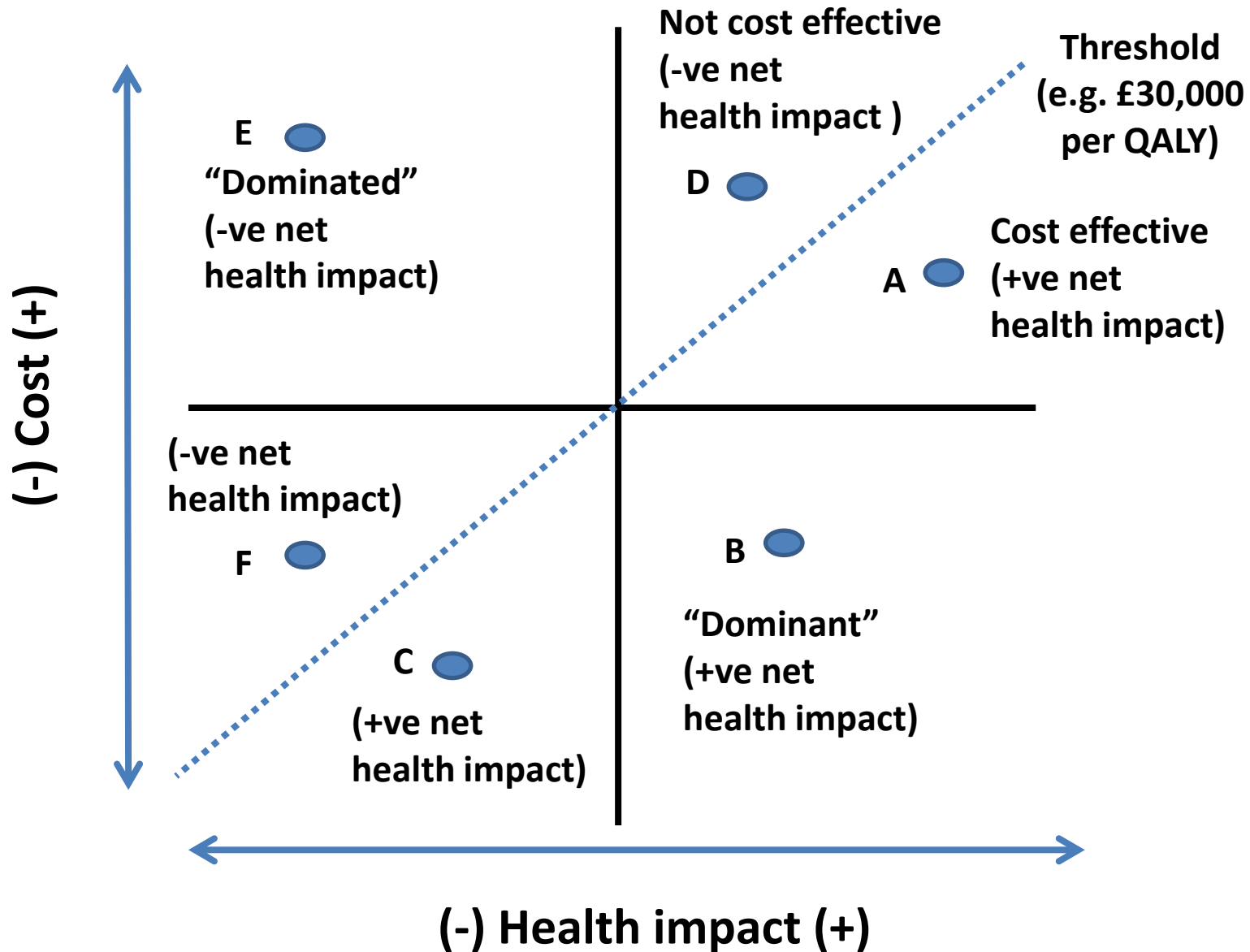
Individual Health Parade



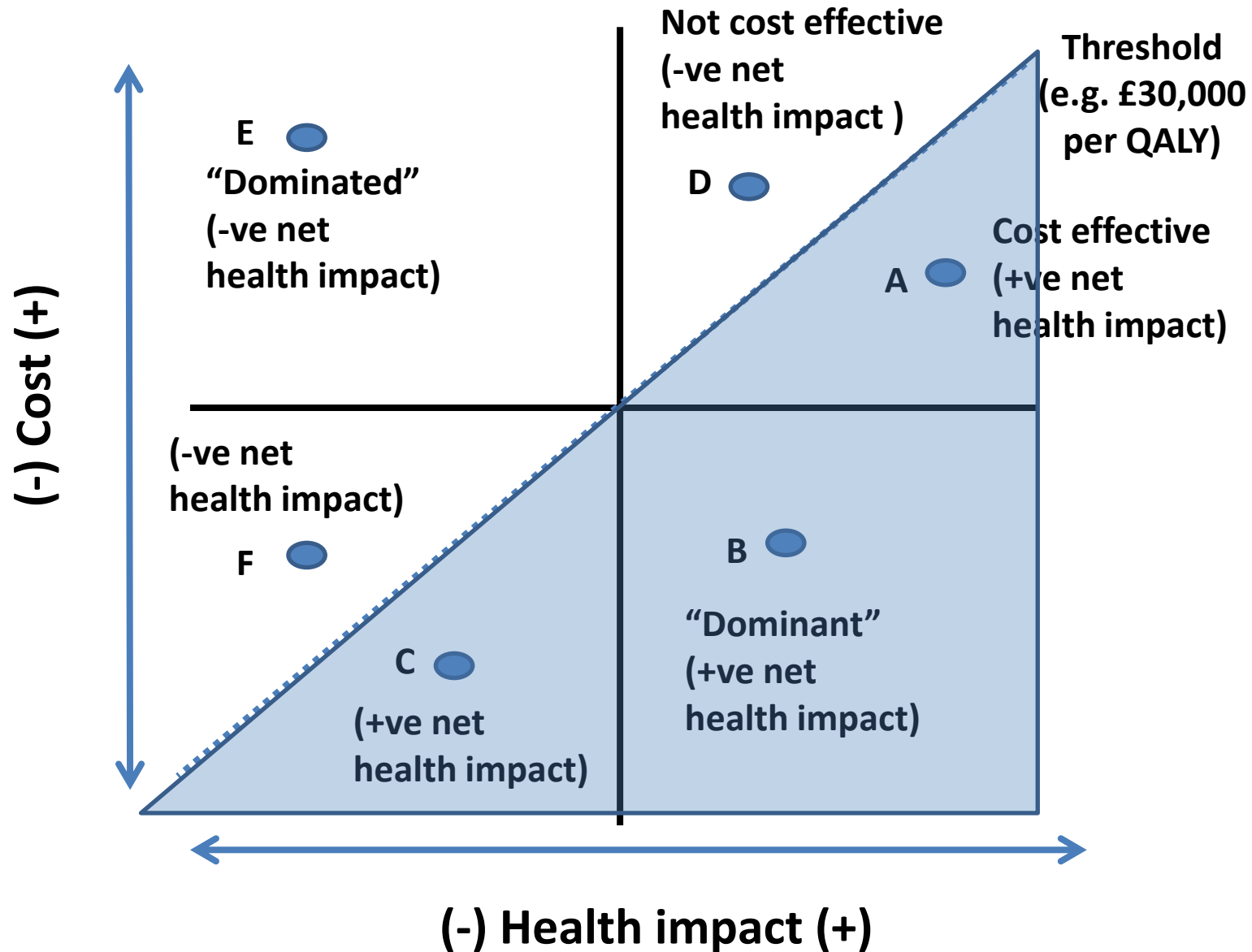
Lorenz Health

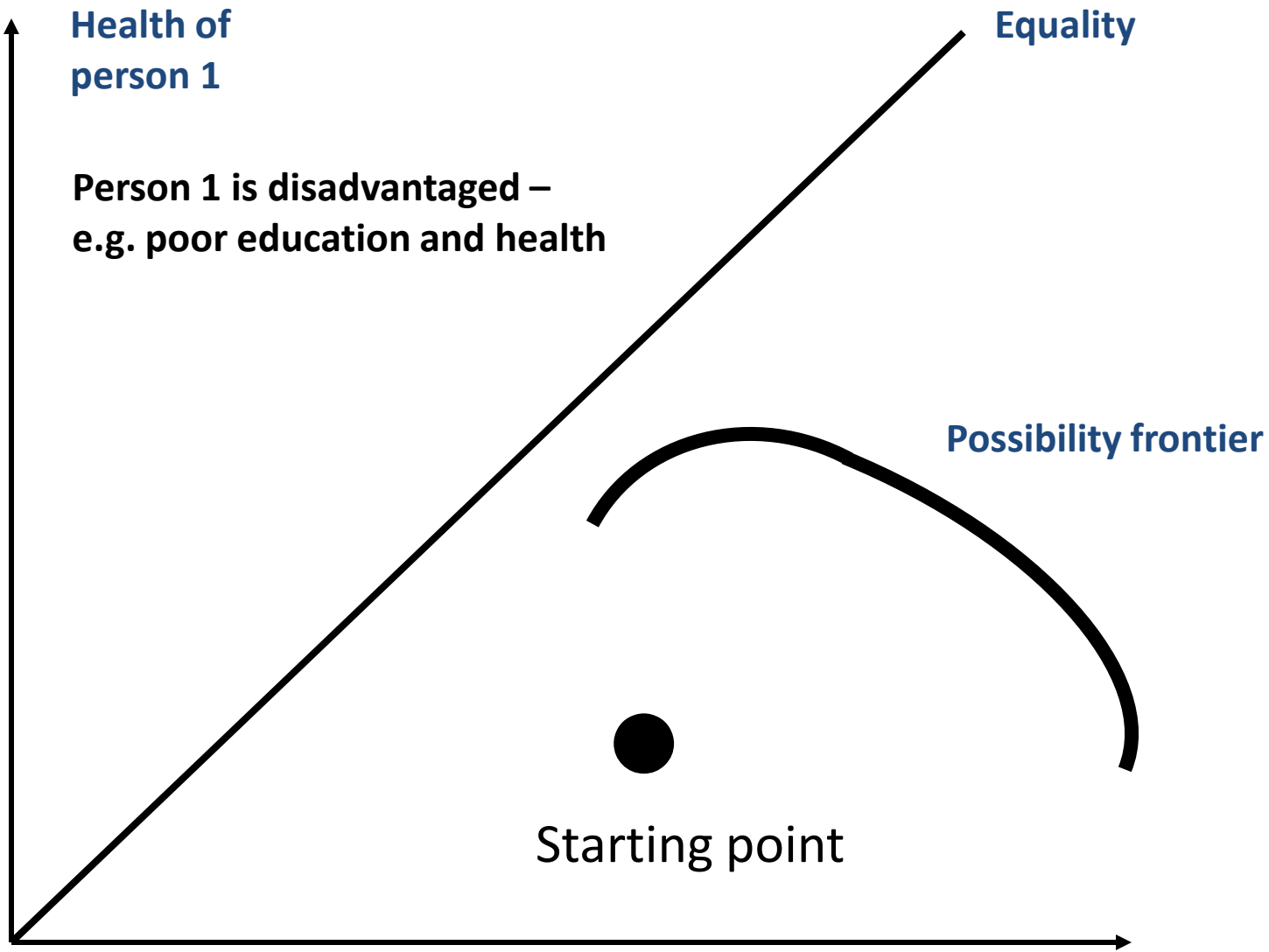


The cost effectiveness plane



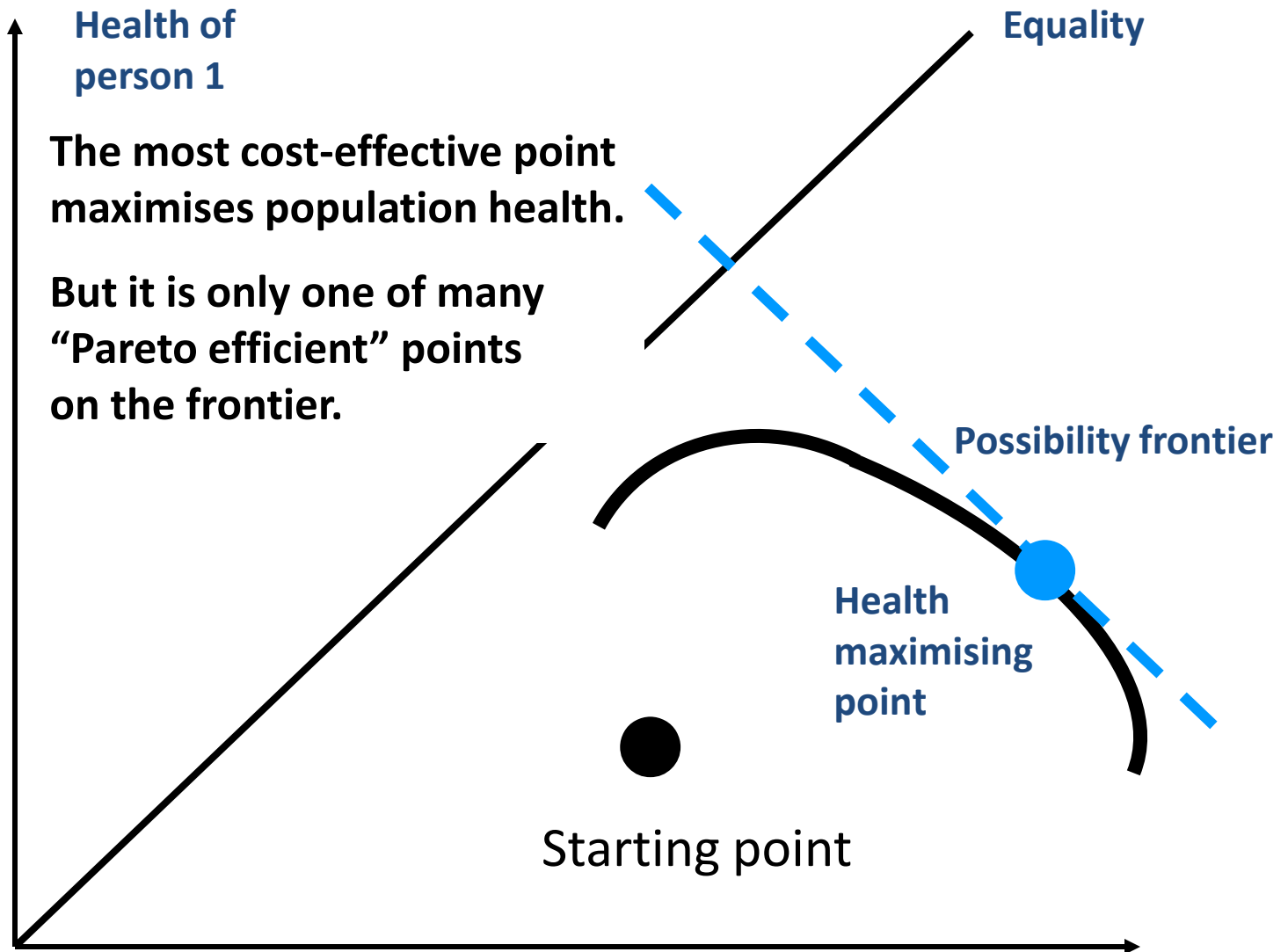
The cost effectiveness plane



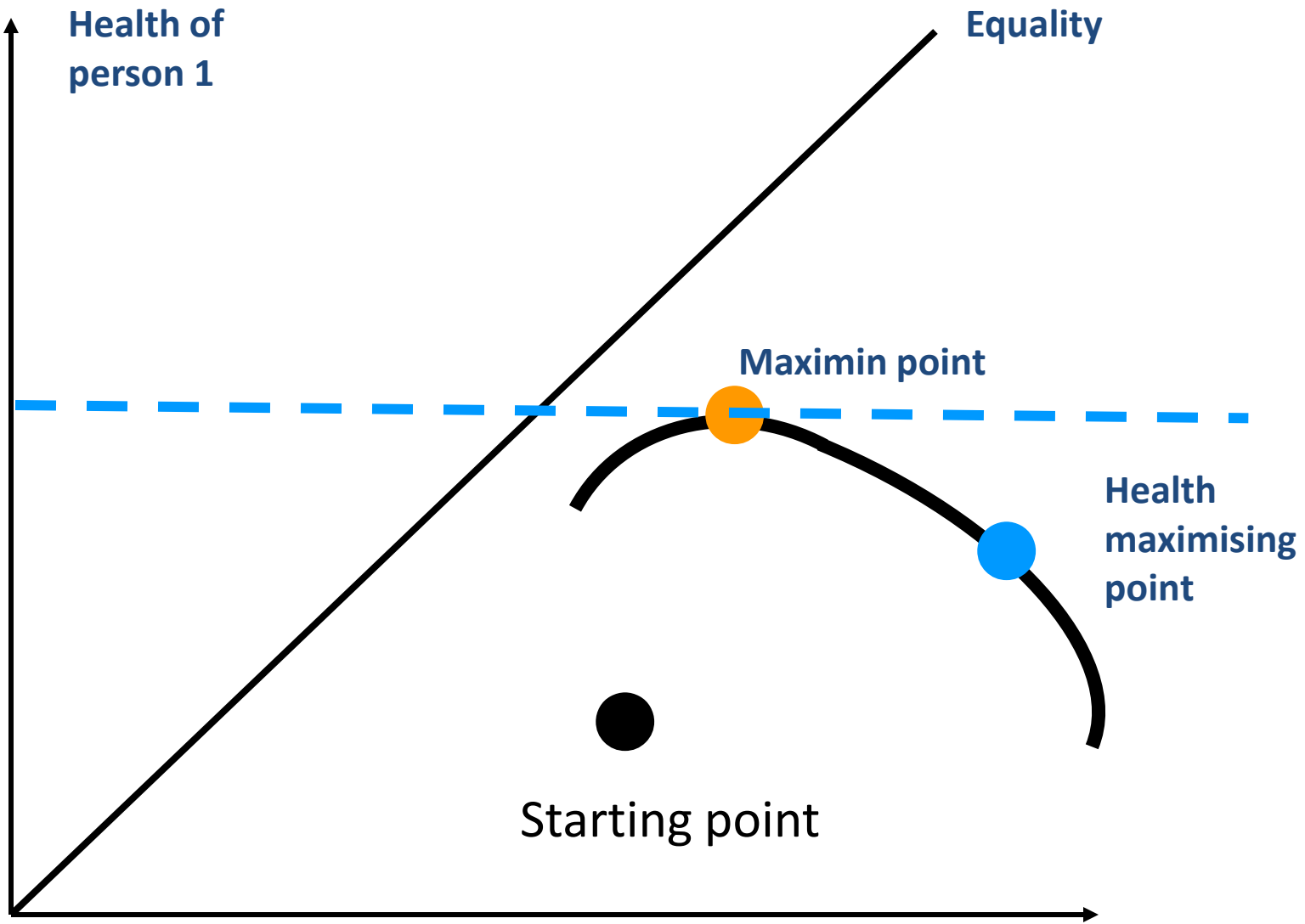


Cost-effectiveness and inequality

Health of person 2

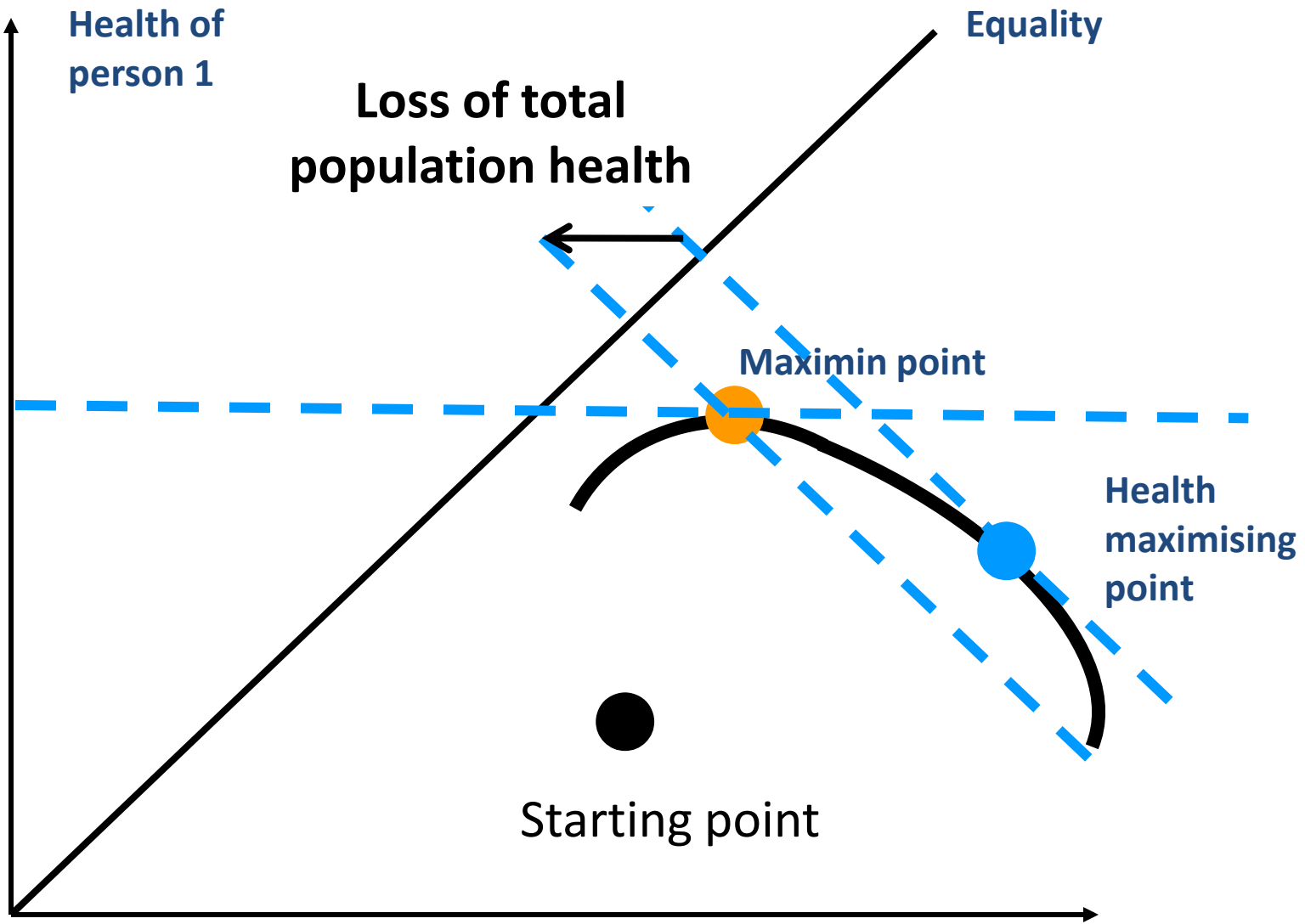


Cost-effectiveness and inequality



Cost-effectiveness and inequality

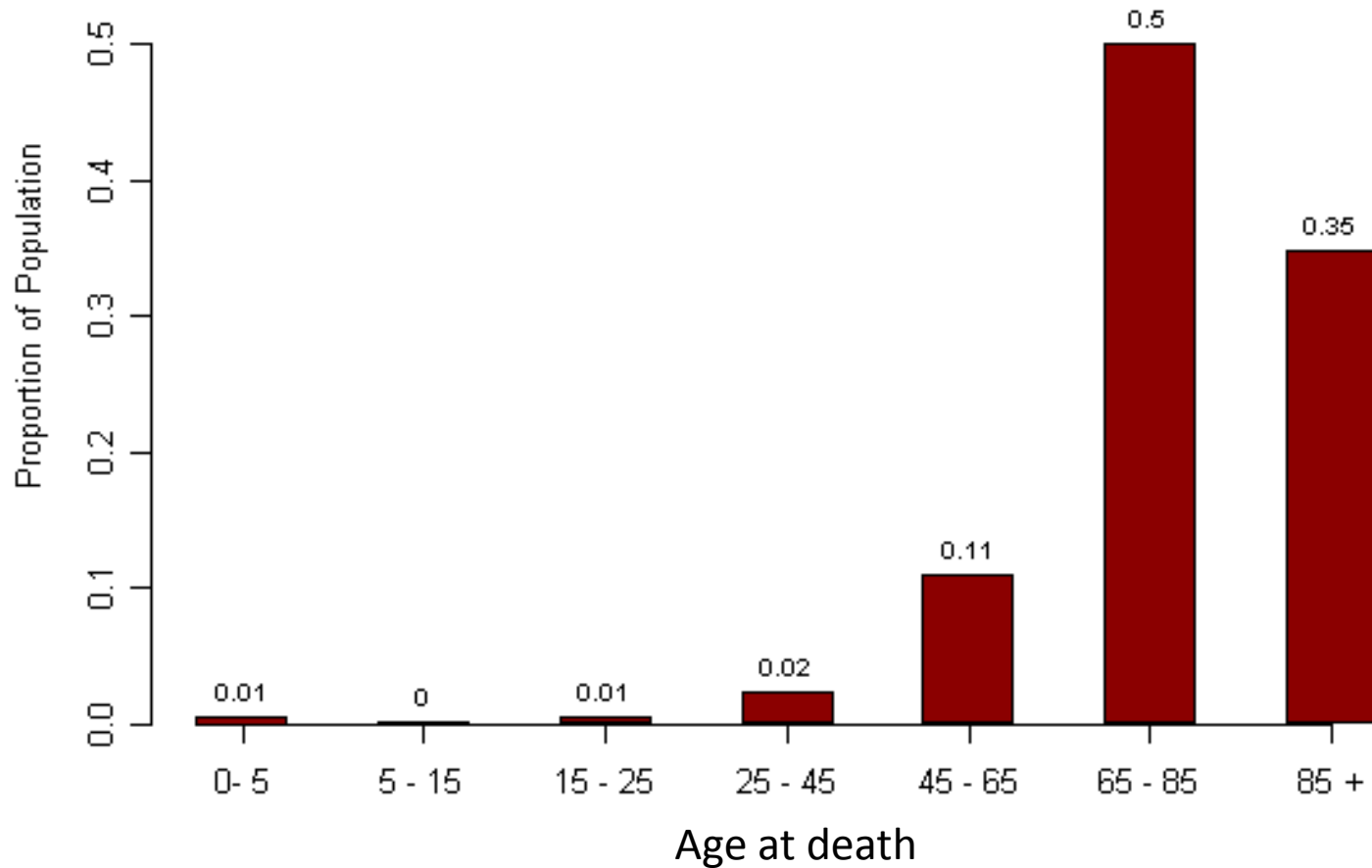
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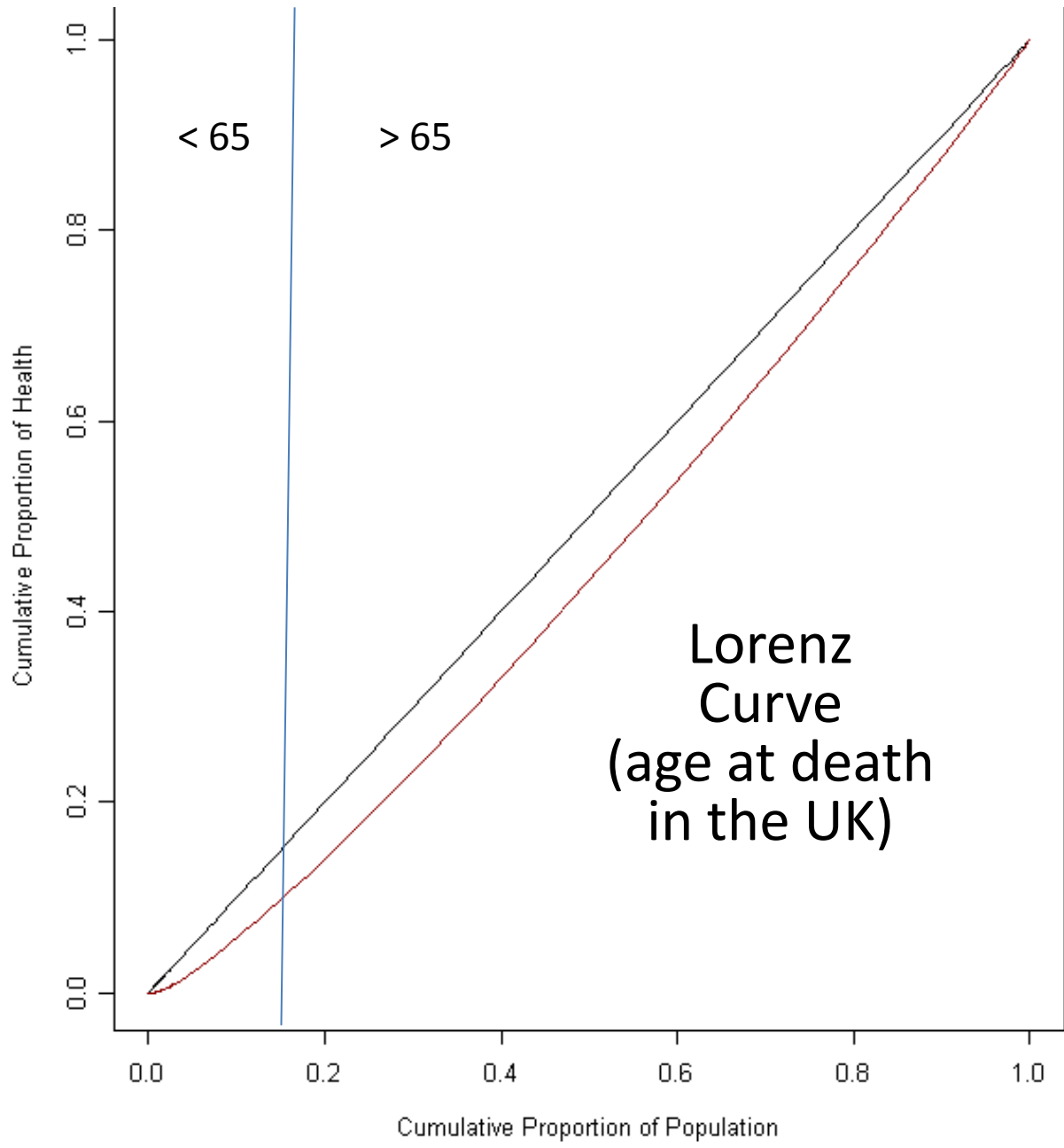


Cost-effectiveness and inequality

Health of person 2

Age at death in the UK





Strategic Review of Health Inequalities in England Post-2010 – The Marmot Review

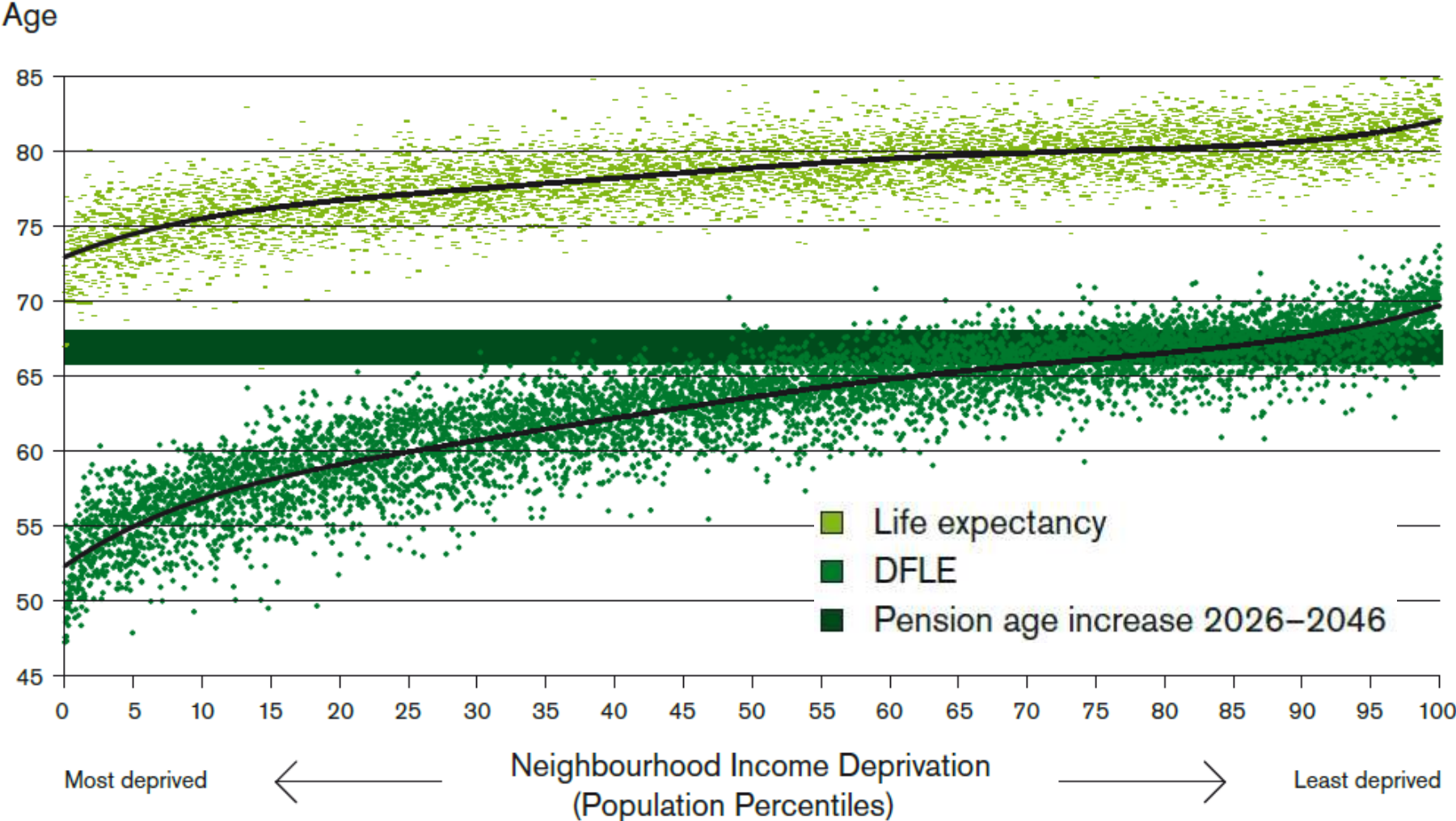
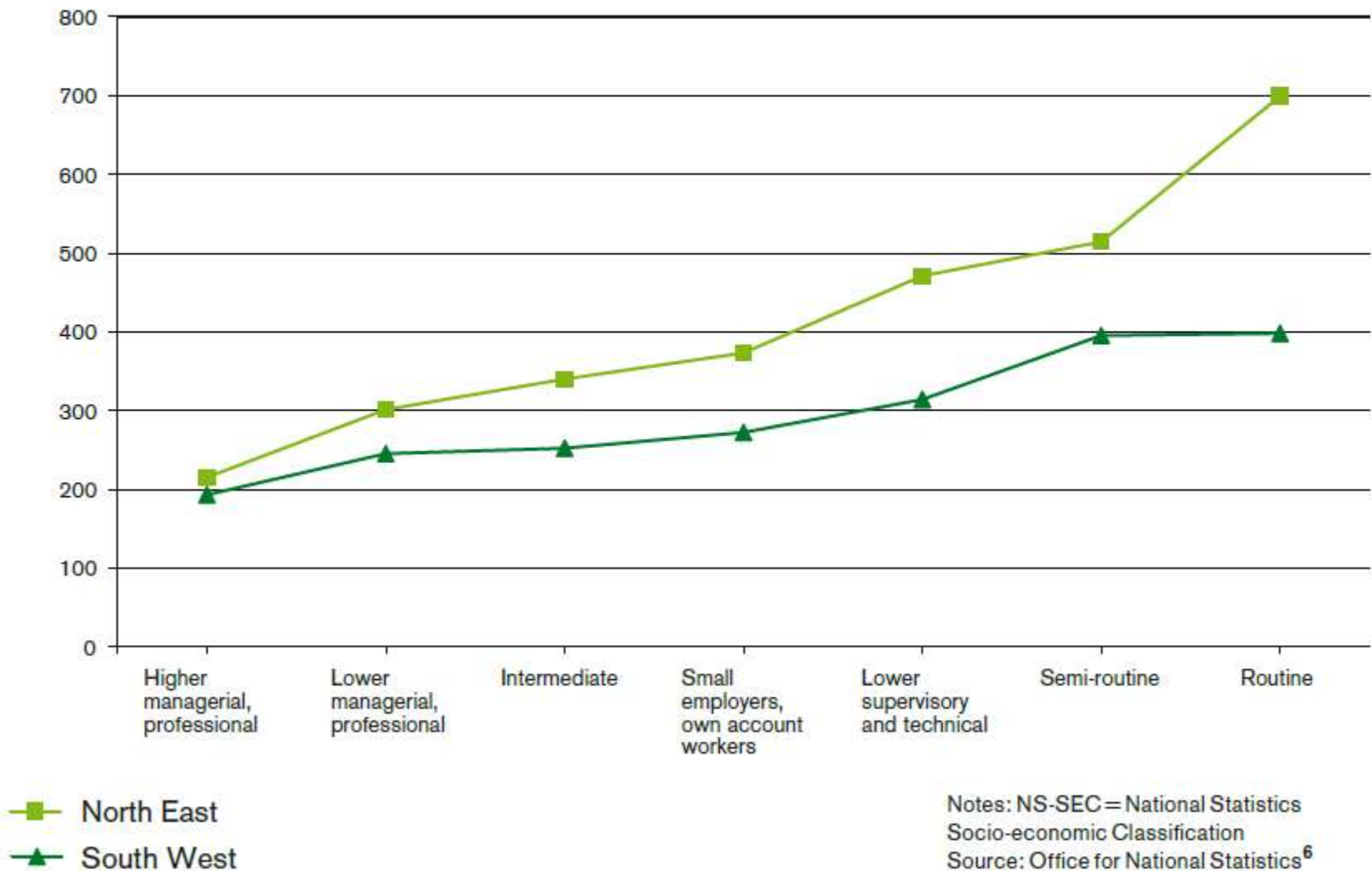


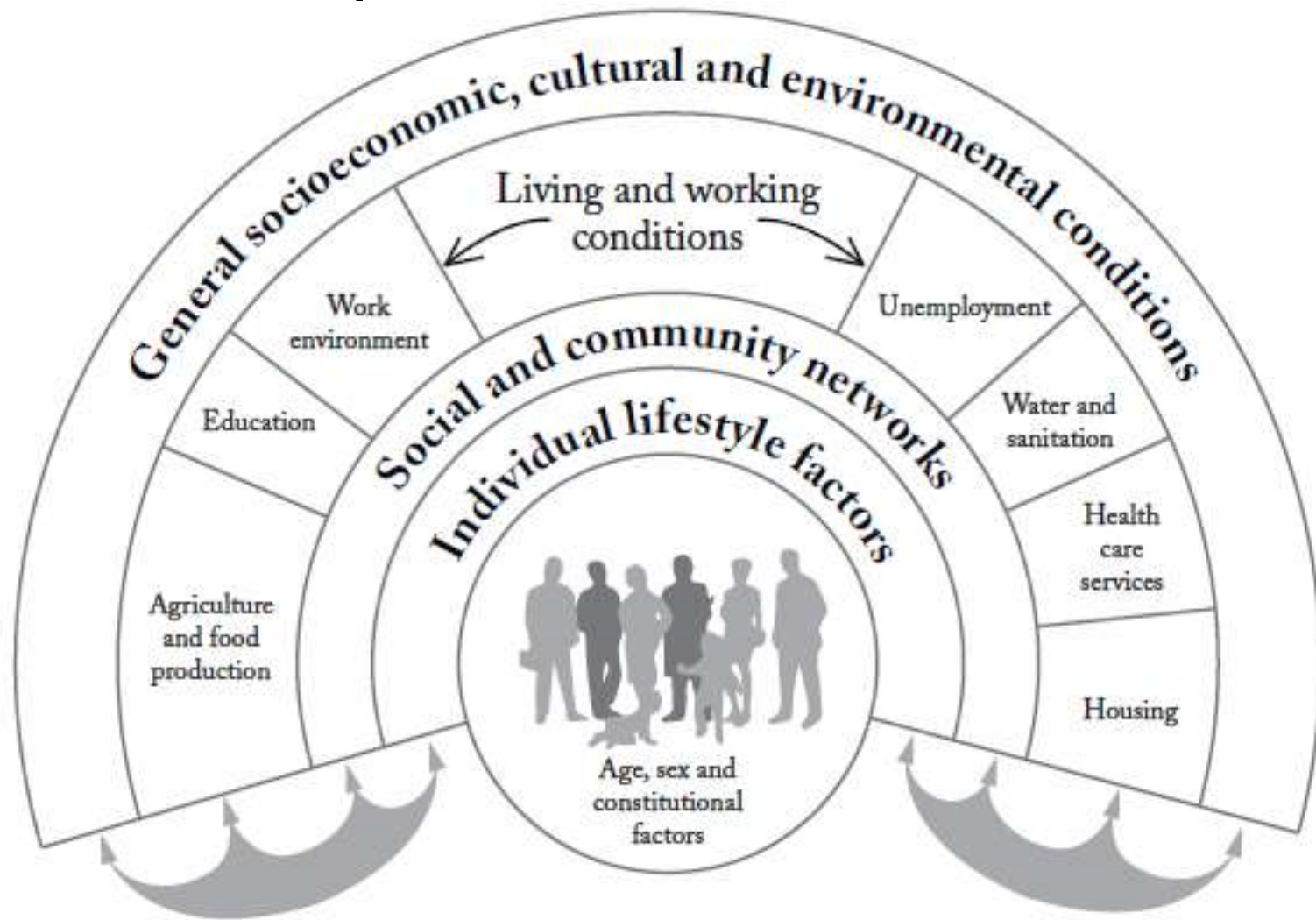
Figure 2 Age standardised mortality rates by socioeconomic classification (NS-SEC) in the North East and South West regions, men aged 25–64, 2001–2003

Mortality rate
per 100,000



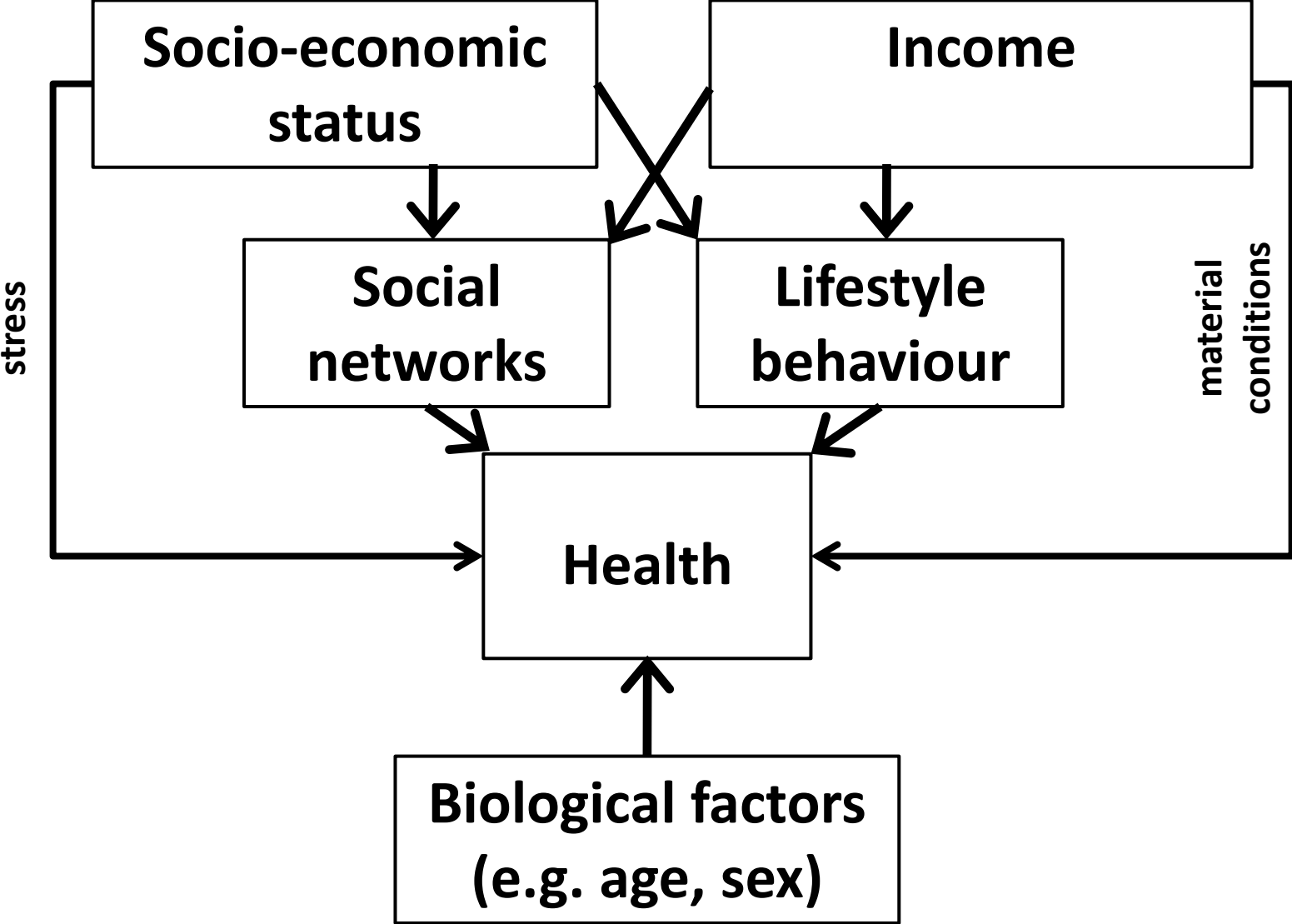
Possible causes of social gradients in health

Dahlgren and Whitehead “layers of influence” account

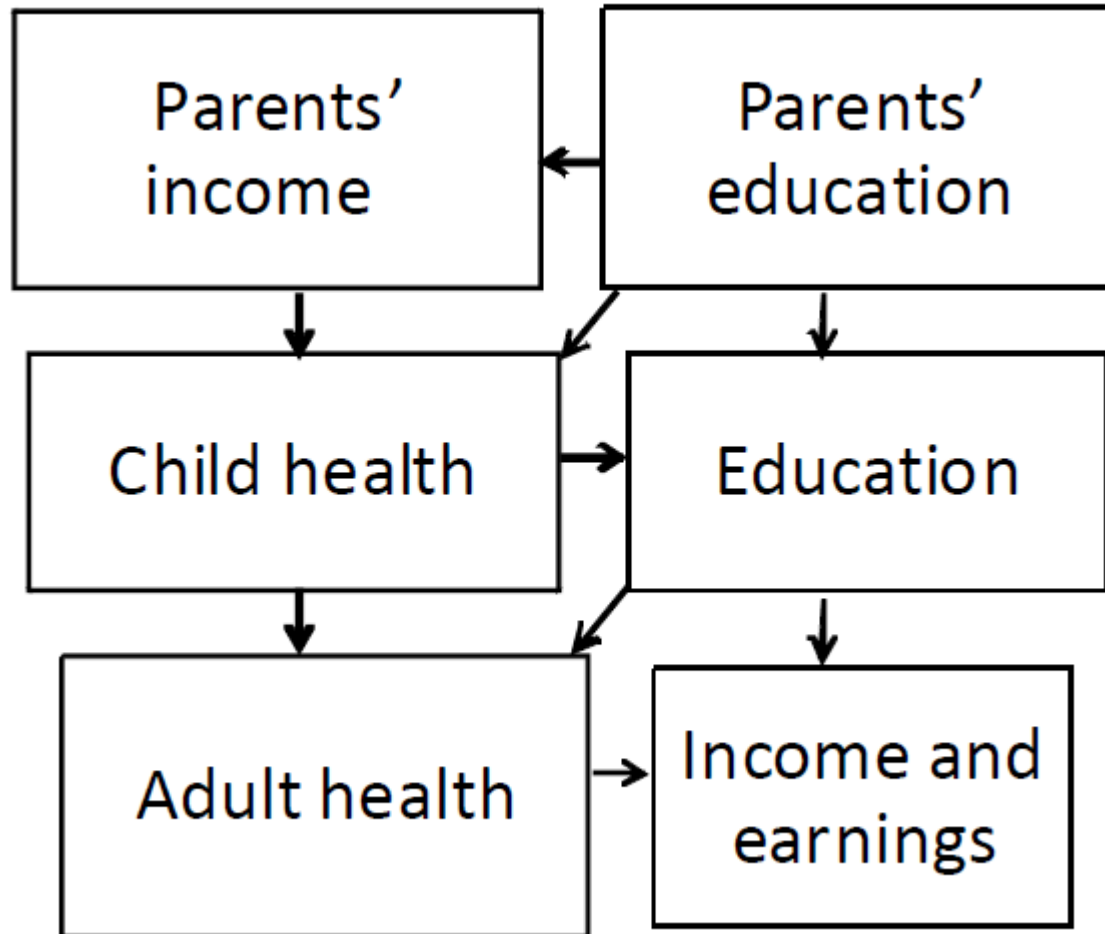


Source: Dahlgren G, Whitehead M (2007). European strategies for tackling social inequities in health: Levelling up Part 2, WHO Regional Office.

Too simple – no reverse causation



Deaton's account



Source: Deaton, A. (2011) What does the empirical evidence tell us about the injustice of health inequalities? Pre-print version of chapter forthcoming in Eyal, N, Hurst, S, Norheim, O and Wikler, D. Measurement and ethical evaluation of health inequalities.

Example Policy Recommendations

A: Early Years

Policy recommendations

- 1 Increase the proportion of overall expenditure allocated to the early years and ensure expenditure on early years development is focused progressively across the social gradient.
- 2 Support families to achieve progressive improvements in early child development, including:
 - Giving priority to pre- and post-natal interventions that reduce adverse outcomes of pregnancy and infancy
 - Providing paid parental leave in the first year of life with a minimum income for healthy living
 - Providing routine support to families through parenting programmes, children's centres and key workers, delivered to meet social need via outreach to families
 - Developing programmes for the transition to school.
- 3 Provide good quality early years education and childcare proportionately across the gradient. This provision should be:
 - Combined with outreach to increase the take-up by children from disadvantaged families
 - Provided on the basis of evaluated models and to meet quality standards.

B: Children & Young People

Policy recommendations

- 1 Ensure that reducing social inequalities in pupils' educational outcomes is a sustained priority.
- 2 Prioritise reducing social inequalities in life skills, by:
 - Extending the role of schools in supporting families and communities and taking a 'whole child' approach to education
 - Consistently implementing 'full service' extended school approaches
 - Developing the school-based workforce to build their skills in working across school-home boundaries and addressing social and emotional development, physical and mental health and well-being.
- 3 Increase access and use of quality lifelong learning opportunities across the social gradient, by:
 - Providing easily accessible support and advice for 16–25 year olds on life skills, training and employment opportunities
 - Providing work-based learning, including apprenticeships, for young people and those changing jobs/careers
 - Increasing availability of non-vocational lifelong learning across the life course.

C: Employment

Policy recommendations

- 1 Prioritise active labour market programmes to achieve timely interventions to reduce long-term unemployment.
- 2 Encourage, incentivise and, where appropriate, enforce the implementation of measures to improve the quality of jobs across the social gradient, by:
 - Ensuring public and private sector employers adhere to equality guidance and legislation
 - Implementing guidance on stress management and the effective promotion of well-being and physical and mental health at work.
- 3 Develop greater security and flexibility in employment, by:
 - Prioritising greater flexibility of retirement age
 - Encouraging and incentivising employers to create or adapt jobs that are suitable for lone parents, carers and people with mental and physical health problems.

Example Policy Recommendations

D: Healthy Standard of Living

Policy recommendations

- 1 Develop and implement standards for minimum income for healthy living.
- 2 Remove 'cliff edges' for those moving in and out of work and improve flexibility of employment.
- 3 Review and implement systems of taxation, benefits, pensions and tax credits to provide a minimum income for healthy living standards and pathways for moving upwards.

E: Communities

Policy recommendations

- 1 Prioritise policies and interventions that reduce both health inequalities and mitigate climate change, by:
 - Improving active travel across the social gradient
 - Improving the availability of good quality open and green spaces across the social gradient
 - Improving the food environment in local areas across the social gradient
 - Improving energy efficiency of housing across the social gradient.
- 2 Fully integrate the planning, transport, housing, environmental and health systems to address the social determinants of health in each locality.
- 3 Support locally developed and evidence-based community regeneration programmes that:
 - Remove barriers to community participation and action
 - Reduce social isolation.

F: Prevention

Policy recommendations

- 1 Prioritise investment in ill health prevention and health promotion across government departments to reduce the social gradient.
- 2 Implement an evidence-based programme of ill health preventive interventions that are effective across the social gradient by:
 - Increasing and improving the scale and quality of medical drug treatment programmes
 - Focusing public health interventions such as smoking cessation programmes and alcohol reduction on reducing the social gradient
 - Improving programmes to address the causes of obesity across the social gradient.
- 3 Focus core efforts of public health departments on interventions related to the social determinants of health proportionately across the gradient.