The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Quantitative measures of inequities

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Session learning outcomes

You should be able to:

1. Describe quantitative measures of health inequities
2. Apply quantitative measures of health inequities in the context of evaluation of interventions/policies aimed at reducing health inequities

DIMENSIONS OF INEQUALITY/INEQUITY & DEPRIVATION MEASURES

Dimensions of inequality/inequity

Categorisations which may be used to define health inequalities/inequities:

1. Social demography (age, sex, area of residence, ethnicity/race)
2. Social & economic status (income, education, social class, employment)
3. Social environment (housing conditions, social networks, social support)

Composite measures: use of indices to measure deprivation

- General agreement that deprivation is a multi-dimensional concept
- Example from UK: Townsend deprivation score is an area-based measure derived from census data (car and house ownership, over-crowded living conditions, unemployment)

POST-SESSION DISCUSSION: area-based socioeconomic measures (ABSMs) from other parts of the world

Individual versus area-based measures

- Trade-off between convenience and accuracy
- ABSMs prone to ecological fallacy
- Some elements of deprivation could only be measured at a group level (usually neighbourhood) e.g. neighbourhood crime and facilities

Developing an index of deprivation

- Step 1: Conceptualising deprivation using survey based methods
  - Relative deprivation approach: respondents asked to define 'essential items' from a list and their ability to access these
  - The attitudinal approach: Respondents asked to estimate income levels which they consider "just enough to make ends meet", "insufficient" or on which they could "only manage with some difficulty"

ABSOLUTE VS. RELATIVE DEPRIVATION

Types of inequality: relative vs. absolute

- Relative deprivation: mortality or morbidity of the lowest socioeconomic group (SEG) compared to the highest SEG.
- Absolute deprivation for e.g. is a particular group falling below a threshold (below poverty line, below minimum wage etc.)
- Your choice of measure depends on your perspective

Implications of the absolute-relative deprivation measurement choice?

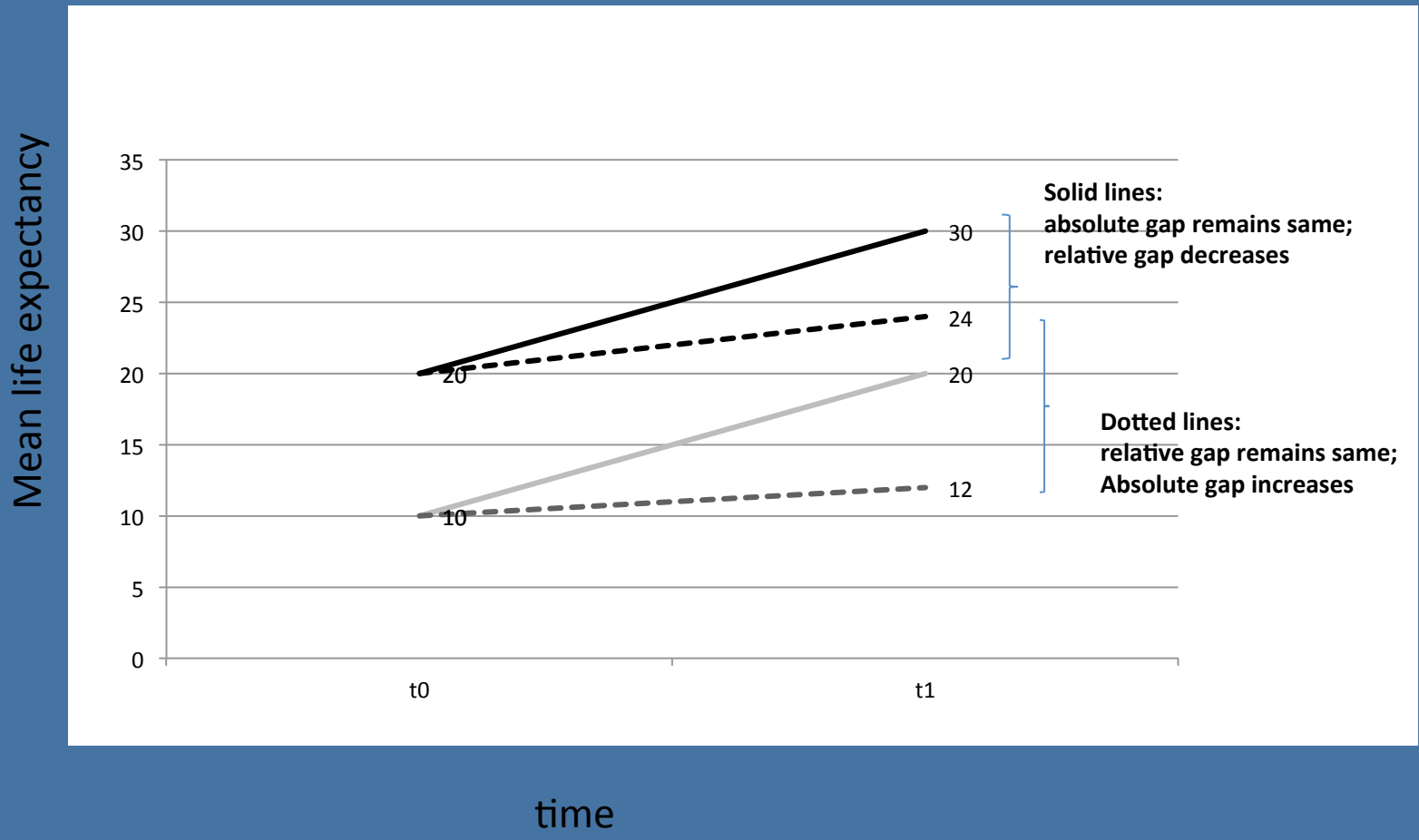
- General agreement that the health inequalities gap cannot be narrowed by lowering the health status of the more affluent groups or even insisting that their health status remains static.
- May not be a realistic scenario even if this was an option
- Is it therefore realistic to expect a reduction in the relative inequalities gap?

Implications of the absolute-relative deprivation measurement choice? 2

- Should we be aiming towards an absolute minimum standard of health and health services provision rather than attempting to reduce the health inequalities gap?
- For the 'materialist/structural' theorists, this may be an option
- For the psychosocial theorists like Wilkinson, the relative gap is crucial (the concept of egalitarian societies)

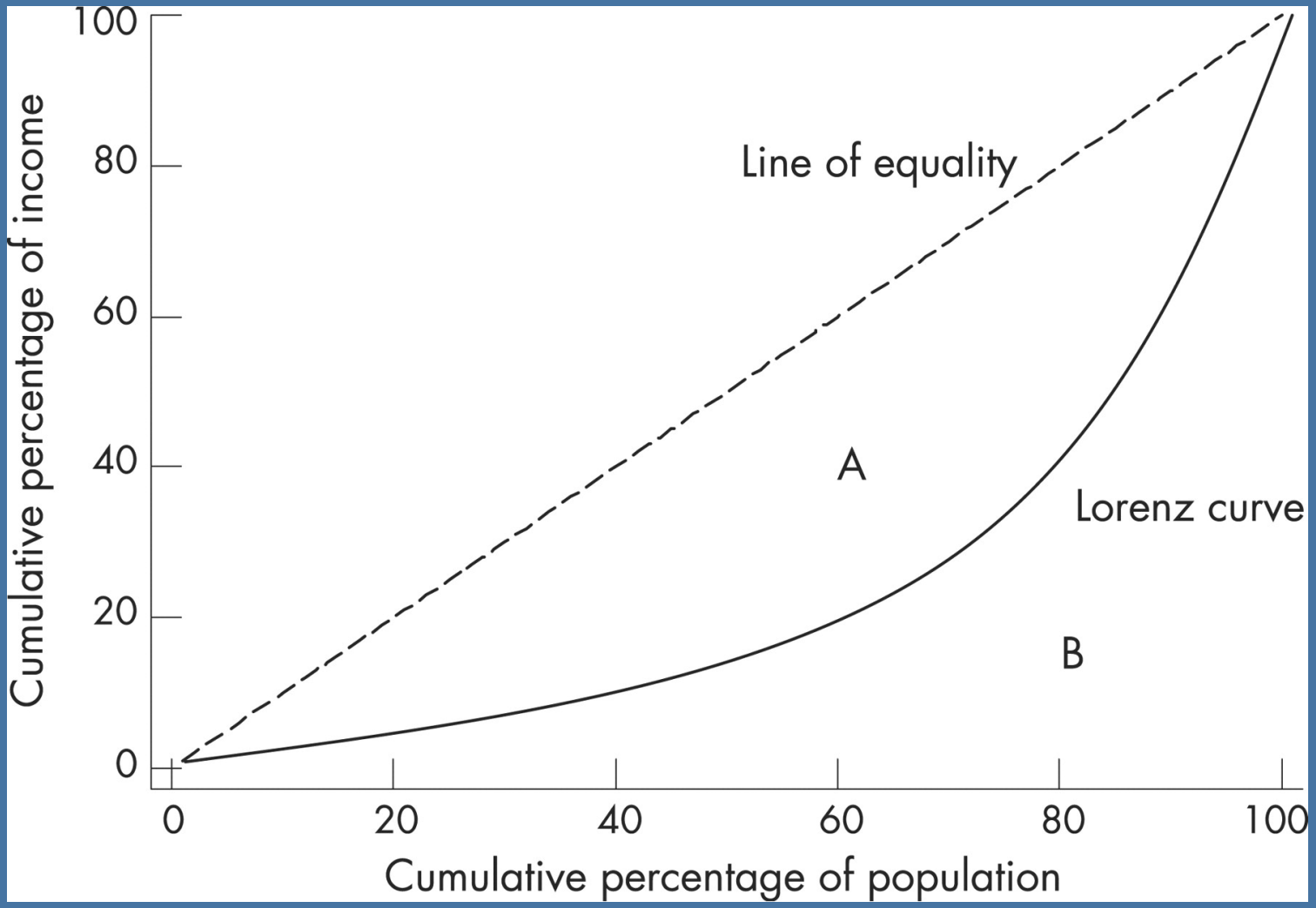
ABSOLUTE (DIFFERENCE) VERSUS RELATIVE (RATIO) MEASURES

Beware of absolute-relative measurement paradoxes



MEASURING INCOME INEQUALITY:
LORENZ CURVE AND GINI COEFFICIENT

The Lorenz curve framework (hypothetical data).



De Maio F G J Epidemiol Community Health 2007;61:849-852

Lorenz curve and Gini coefficient

- The Lorenz curve is derived by plotting cumulative percentage of total income (Y-axis) against the cumulative percentage of the population (ranked from poorest to highest) on the X-axis
- Perfect 'equality' is denoted by a straight 45 ° diagonal
- As inequality increases, the Lorenz curve deviates from the line of equality and the curvature increases

Lorenz curve and Gini coefficient-2

- The Gini coefficient is a mathematical representation of the extent of the curvature or 'inequality'. It has values between 0 and 1. "0" signifies perfect equality and "1" signifies perfect inequality
- The Lorenz curve and Gini coefficient have been used to represent income inequality (total inequality)

Adapting the Lorenz curve and Gini coefficient to evaluate the impact of health inequalities policies over time

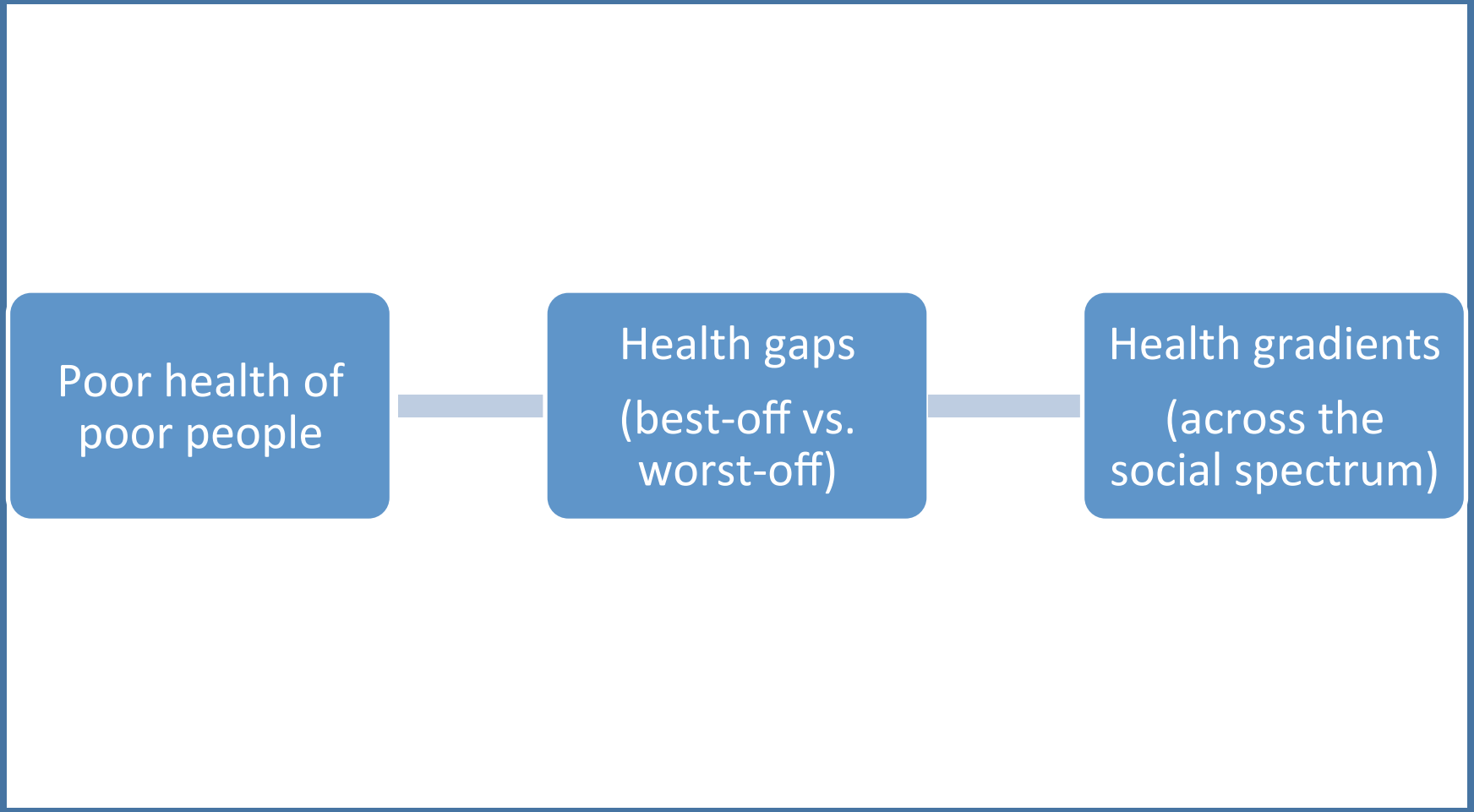
- Lorenz curves can be used to assess health inequalities by plotting cumulative health attainment on the y-axis and cumulative proportion of individuals by level of health ranked in increasing order on x-axis (Regidor, 2004; doi:10.1136/jech.2003.015347)
- Measures such as disease morbidity, mortality or total health-related quality of life (as ascertained by SF-36 or EQ-5D) could be used to assess health
- Socio-economic classes could be plotted on the x-axis in ascending rank order
- Plot separate curves representing different time periods and calculate Gini coefficient
- Could include curves for comparator areas

Limitations of adaptations of Lorenz curve/Gini index

- Scenario: Cumulative health attained plotted on y-axis and socioeconomic status in increasing order plotted on x-axis
- Cannot distinguish between a situation where the sickest individuals belong to lowest socioeconomic level and where sickest individuals belong to highest socioeconomic level

APPLICATION & EXAMPLES

Your conceptualisation of health inequities drives your policy decisions and measurements



Focusing on people in poverty

- Targeting approach aimed to improve health status of disadvantaged groups
- Effective policy shows positive changes in targeted outcomes in disadvantaged groups
- Measurement options:
  - compare outcomes in a similar group without policy intervention
  - Measure changes in target group (before and after)
  - Compare post-intervention outcomes in target group to threshold value (target)

Narrowing the health divide

- Policies aimed at reducing health inequities between best-off and worst-off
- Effective policy would achieve both absolute and relative improvement in health of poorest groups
- Data needed on pre- and post-intervention health outcomes in both worst-off and best-off
- Faster rate of improvement in worst-off essential if narrowing gaps is the policy goal

Reducing social inequities across the population

- Policy aim to equalise health opportunities across social spectrum
- Effective policy needs to demonstrate:

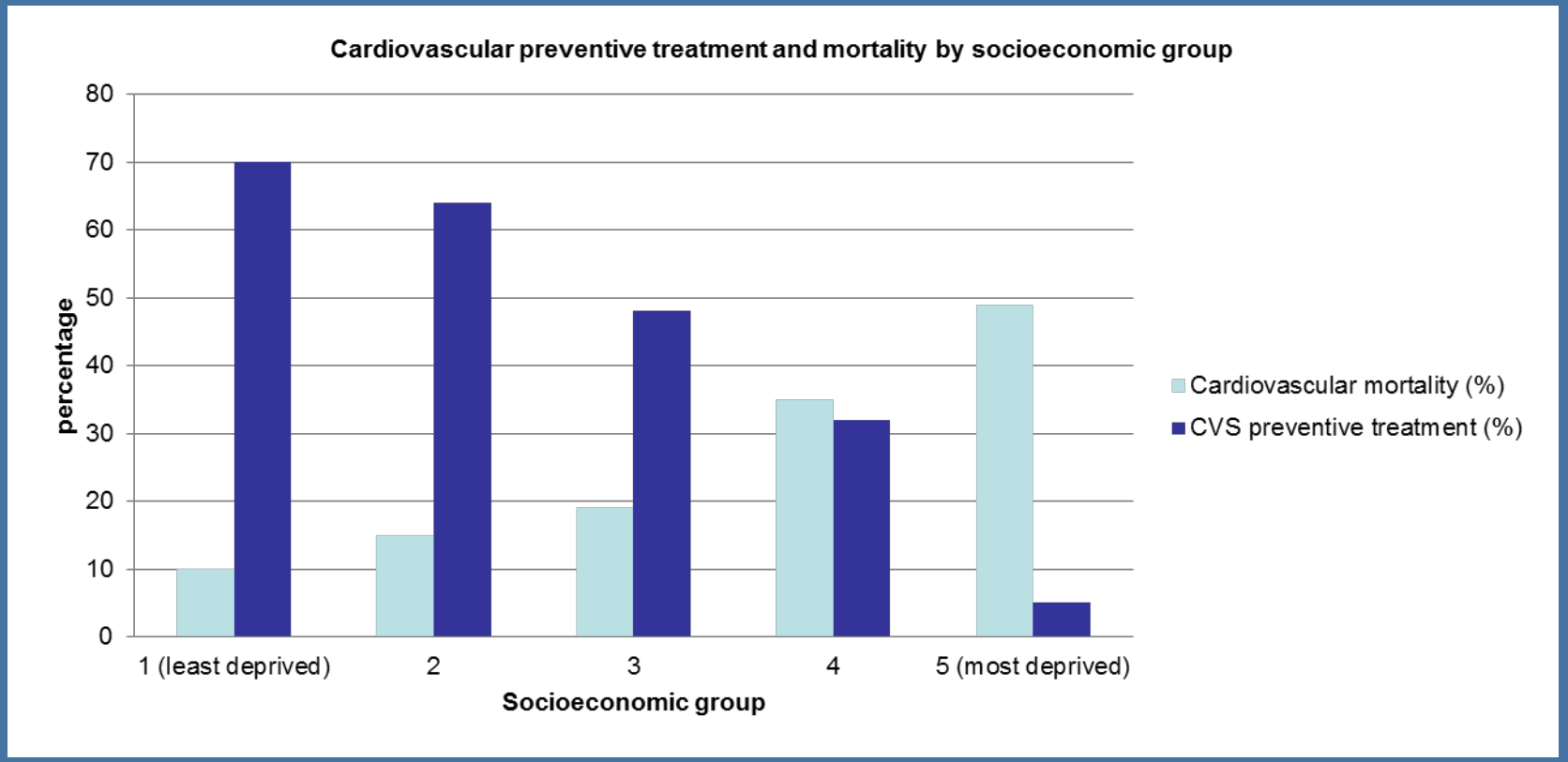
(a) Improvements in health for **all** social groups

(b) Differential rate of improvement with poorest groups showing fastest improvement and rate of gain progressively decreasing for higher socio-economic groups

- Data needs: pre- and post-intervention health outcomes for all social groups

YOUR TURN…

Policy aim: address inequities in CVS preventive treatment



Pre-intervention Health Equity Audit findings

GROUP DISCUSSION 1

- What policy approach will you adopt (targeting the poorest, narrowing the health divide, reducing inequities across the social spectrum)?
- Based on your choices, what sort of changes would you like to see in the post-intervention health equity audit?
- Are you interested in relative or absolute reduction in health inequities?

GROUP DISCUSSION 2: Measures of deprivation

- Are you aware of any area-based socioeconomic measures from your country/region?

- If you had to develop a composite measure of socioeconomic deprivation/status appropriate to your setting, what would you include and why (your index could be either area-based or an individual level measure)?