Fairer Decisions, Better Health
An Introduction to Equity Informative Health Economic Evaluation

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Introduction

• Standard cost-effectiveness analysis (CEA) focuses on efficiency in terms of aggregate costs and effects

• Distributional cost-effectiveness analysis (DCEA) adds information about equity in the distribution of costs and effects

• DCEA can provide information about equity impacts and trade-offs relating to unfair differences in health, healthcare delivery and financial protection by social variables (e.g. socioeconomic status, ethnicity, location), disease categories (e.g. severity of illness, end-of-life, rarity) and other equity-relevant variables (e.g. age, gender, disability).
Applicable to many different types of health policy decision

- Purchasing health care technologies – e.g. whether to fund a cancer drug, at what price, and for which patients?
- Designing health care benefit packages – e.g. whether to cover diabetes and if so which treatments to include?
- Investing in health care infrastructure and incentives – e.g. whether to invest in primary care strengthening, and if so how to design workforce payment structures and prioritise investments in different geographical areas?
- Public health – e.g. whether to introduce a sugar tax, and if so at what level?
What can cost-effectiveness do for equity?

• Describing problems is not enough

• Analysing effectiveness is not enough
  – Not enough to know a programme benefits the worse-off
  – Need to know: BY HOW MUCH? and AT WHAT COST?
  – Need to know: WHO LOSES? as well as WHO GAINS?
  – Programmes have opportunity costs (e.g. other services not funded, e.g. reduced income due to higher taxes): who bears these burdens?

• Trials and quasi-experiments are not enough
  – The consequences of complex interventions depend on numerous interacting causal pathways and variables
  – Need simulation modelling to glue together different pieces of knowledge (evidence, theory, opinion)
Why this is methodologically interesting

• Not just sub-group analysis of RCTs and QEDs
  – Distribution of opp cost matters, not just effects
  – Equity is a general population concept: not just about differences within programme recipients

• Interesting ethics and economics challenges
  – Trade-offs between efficiency and equity
  – Non-maximising ways of thinking about ethics

• Interesting technical challenges
  – Modelling complexity using imperfect data
  – *Ex post* distributions (distribution of effects on variance and covariance, not just mean)
Cost effective ... but maybe increases inequality?

\[ \text{Net Health Benefit} = \text{Health Gained} - \text{Health Displaced} \]

Cost-effectiveness “threshold value” (e.g. £13,000 per QALY)
Cost ineffective... but maybe reduces inequality?

Net Health LOSS = Health Gained Minus Health Displaced

Cost (C) vs. Health Gain (HG)

$C_x$, $H_{Gx}$, $H_{Dx}$
Equity-Efficiency Impact Plane

- **I. Win-Win**
  - Cost-effective
  - Improves equity

- **II. Win-Lose**
  - Cost-effective
  - Harms equity

- **III. Lose-Lose**
  - Cost-ineffective
  - Harms equity

- **IV. Lose-Win**
  - Cost-ineffective
  - Improves equity
NICE public health guidance plotted in the equity-efficiency impact plane

Equity Principles
Fair Shares
- e.g. fair share of resources in proportion to need
- e.g. fair chance of needed resources

Value Maximising
- Maximise Benefit “Efficiency”
- Minimise Unfair Inequality “Equity”
- Maximise Equity-Weighted Benefit “Social Welfare”

Moral Rights
- e.g. right to autonomy
- e.g. right to be treated with dignity
- e.g. right to non-discrimination

Fair Processes of Decision-Making
(e.g. impartial, accountable, inclusive, transparent)
Priority to the worse off in future health or lifetime health?

e.g. Public funding for (1) a new drug for late stage skin cancer or (2) screening for maternal depression?

• Future health perspective
  – Late stage skin cancer: short remaining life expectancy (a few years)
  – Maternal screening: long remaining life expectancy for both mother and baby (many decades)

• Lifetime health perspective
  – Maternal screening: babies with depressed mothers have lower-than-average healthy life expectancy at birth
  – Most skin cancer deaths in people age 70+
Examples of informal equity concerns

Disadvantaged Patients or Service Users

_Biological disadvantage_
- Severity of illness (e.g. end-of-life, pain and suffering)
- Age (e.g. children, older adults)

_Social disadvantage_
- Income, poverty, education, neighbourhood deprivation
- Geographical location (e.g. rural, disadvantaged area)

_Bio-social disadvantage_
- Ethnicity
- Gender
- Disability

Important Potential for Individual Health Benefit
- Life-saving (i.e. permanently restored to normal life expectancy)
- Large individual health benefit (e.g. many healthy years gained)

Important Treatments
- Innovative technology
- Unavailability of alternative treatment
More examples of informal equity concerns

Special Illnesses or Causes of Illness
- Rare illness (e.g. “orphan” drug, hard to recoup development cost)
- Dreaded illness (e.g. cancer)
- Under-funded illness (e.g. mental health)
- Government responsibility (e.g. hospital infection)
- Individual responsibility (e.g. self-inflicted illness)

Important Non-Health and Non-Patient Benefits
- Impact on household finances
- Impact on productivity
- Impact on carers’ health and wellbeing
- Impact on dependents’ health and wellbeing
- Impact on patient experience

Other Considerations
- Non-discrimination e.g. by age; disability; gender reassignment; marriage and civil partnership; pregnancy and maternity; race; religion or belief; sex; sexual orientation
- Fair chance of treatment despite high cost
Sifting the equity bucket
Equity Methods
Example: Nicotine Replacement Therapy (NRT)

1. No Public NRT: do not provide any public subsidy for nicotine replacement therapy
2. Universal NRT: offer free nicotine replacement therapy to all smokers
3. Proportional Universal NRT: Universal NRT with additional resources to encourage uptake in disadvantaged communities

• Setting: England in 2010
Staircase of Inequality

Inequality in the net health benefits of public NRT programmes depends on inequality in...

- Need (baseline smoking prevalence & quit rates)
- Receipt (uptake of public NRT)
- Adherence (short- and long-term quit rates)
- Capacity to Benefit (competing risks)
- Opportunity Costs
Summary of Gross Health Benefits*
Comparing 2 (Universal NRT) and 3 (Proportional Universal NRT)
Against 1 (No NRT)

* Not allowing for health opportunity costs; by ten unequally sized social groups based on deprivation and North-South residency, ranked by health (baseline health expectancy at birth)
Summary of Net Health Benefits*
Comparing 2 (Universal NRT) and 3 (Proportional Universal NRT) Against 1 (No NRT)

* Allowing for health opportunity costs; by ten unequally sized social groups based on deprivation and North-South residency, ranked by health (baseline health expectancy at birth)
Equity Impact Plane*
Comparing Options 2 and 3 Against 1

Both NRT policies are “Win-Win” compared with no NRT

* “Equity benefit” here defined as reduction in slope index of unfair inequality in health expectancy at birth based on deprivation group and North-South residency
Comparing Option 3 vs. Option 2

* "Equity benefit" here defined as reduction in slope index of unfair inequality in health expectancy at birth based on deprivation group and North-South residency.
Equity-Efficiency Trade-Off Analysis

Social Welfare Impact Compared With No NRT (Population Level Equity-Weighted HALYs)

Aversion to unfair health inequality (Atkinson epsilon)

Equity-Efficiency Trade-Off Analysis

Universal

Proportional

Universal

Equity-Weighted HALYs

0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000

Aversion to unfair health inequality (Atkinson epsilon)
Checklist of questions for designing your own study

1. What key equity-relevant variables are of most concern to policy makers in the context of this decision? (e.g. socioeconomic status, ethnicity, location, gender, severity of illness, end-of-life, rarity, other)

2. What key steps on the staircase of inequality might lead to differences in health benefits by these key equity-relevant variables? (e.g. variations in health risks, access to care, adherence to care, lifetime capacity to benefit)

3. Where do the opportunity costs fall and how might they differ by the equity-relevant variables? (e.g. health expenditure, general public expenditure, private consumption)

4. Are non-health benefits or opportunity costs important in the context of this decision? (e.g. risk of catastrophic health care expenditure, effects on household income, effects on education, employment, crime or other non-health outcomes, costs falling on non-health public expenditure)

5. Might this be a “win-lose” or “lose-win” case involving trade-offs between improving total health and reducing unfair health inequality?
Further information
Equity Informative Economic Evaluation

What is the Equity Informative Economic Evaluation ("triple E") Special Interest Group?
DISTRIBUTIONAL COST-EFFECTIVENESS ANALYSIS
QUANTIFYING HEALTH EQUITY IMPACTS AND TRADE-OFFS

Edited by
Richard Cookson | Susan Griffin | Ole F. Norheim | Anthony J. Culyer
Readings


Resources and Publications

https://equipol.org

Our research methods help policy makers make fairer decisions with better health outcomes.

THE PROBLEM. Existing analyses focus on a mythical average citizen.

THE SOLUTION. We develop ways of analysing who gains and loses from health policies.
The relationship between DCEA and ECEA

1. Distributions of health outcomes only
2. Distributions of health and non-health outcomes
3. Aggregate health and non-health outcomes only

DCEA is (1) + (2); ECEA is (1) + (2) + (3)
Thank you.