University of Glasgow

School of Health & Wellbeing

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HEALTH ECONOMICS AND HEALTH TECHNOLOGY ASSESSMENT

The Price of Life: Evaluating the cost-effectiveness of healthcare interventions

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https://www.gla.ac.uk/researchinstitutes/healthwellbeing/research/hehta/

MRC/CSO Social and Public Health Sciences Unit

UKRI Medical Research Council | CHIEF SCIENTIST OFFICE | University of Glasgow | NIHR | National Institute for Health Research

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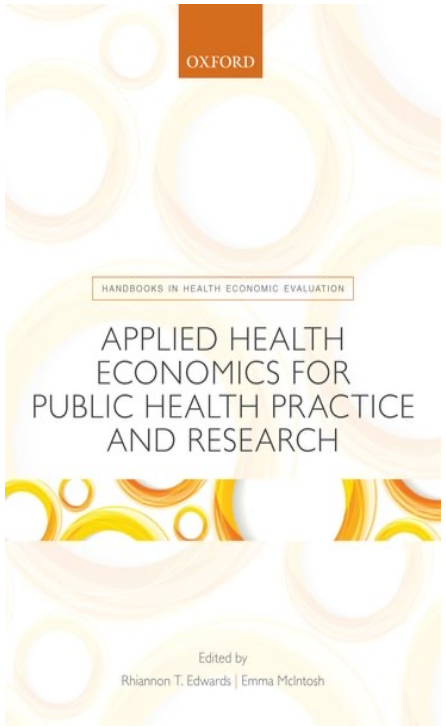
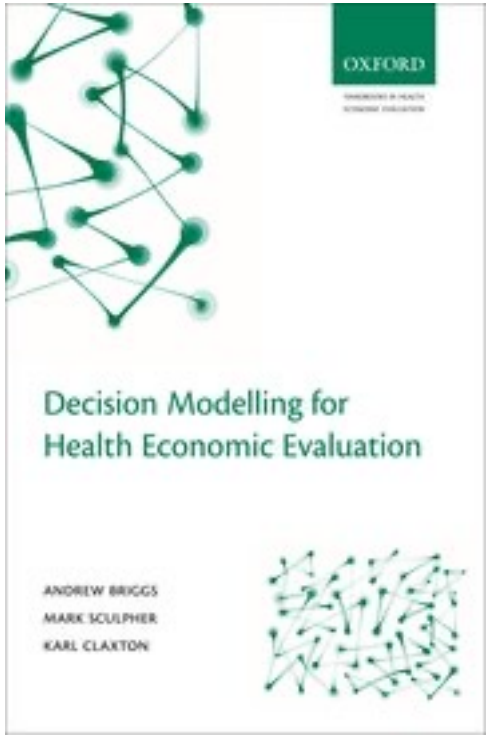
Presentation Outline

- Context
- Market failure in health care
- Key concepts in health economics
- The need for economic evaluation methods to inform health care decision making
- Relationship between socio-economic deprivation and poorer health outcomes
- Measuring health outcomes

Methods Handbooks: Oxford University Press
Co-editors Emma McIntosh / Andy Briggs





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Movement Disorders
Official Journal of the International Parkinson and Movement Disorder Society

Research Article

Cost-utility analysis of deep brain stimulation surgery plus best medical therapy versus best medical therapy in patients with Parkinson's: Economic evaluation alongside the PD SURG trial

Emma McIntosh PhD, Alastair Gray PhD, Jane Daniels PhD, Steven Gill FRCS, Natalie Ives MSc, Crispin Jenkinson DPhil, Rosalind Mitchell FRCS, Hardev Pall MD, Smitaa Patel MSc ... See all authors

First published: 05 February 2016 | https://doi.org/10.1002/mds.26423 | VIEW METRICS

Members of The PD SURG Collaborators Group are listed in the appendix to this article.

Funding agencies: The study sponsors (Medical Research Council, NHS, and Department of Health) had no role in the design, collection, analysis, interpretation of the data or writing the research. Dr Emma McIntosh had full access to all the data in the study and took final responsibility for the decision to submit for publication.

Relevant conflicts of interest/financial disclosures: NQ received reimbursement fees from Medtronic for time spent collecting and analysing data as a member of the ad hoc adverse-event committee for another multicentre study on deep brain stimulation in Parkinson's disease. The other authors have no conflicts of interest.

Full financial disclosures and author roles may be found in the online version of this article.

University of Glasgow's Health Economics team (HEHTA) Themes and Methods_2026

TRAINING AND CAREER DEVELOPMENT

RESEARCH & ADMINISTRATIVE SUPPORT

CONTEXT

- Diagnostics and Therapeutics
- Health in a changing Planet
- Social policy and health
- Global Health

METHODOLOGY

- Evidence Synthesis
- Economic Evaluation alongside Clinical Trials
- Decision Analytical Modelling and Simulation
- Analysis of Linked Health Data
- Incorporating Perspectives & Experiences

UK Health Economics centres

- MSc Health Economics (Glasgow, York, London, Oxford, Cambridge, Manchester)
- Health Economics Research Groups affiliated to many UK Universities, funded by UK's Department of Health research grants (MRC/NIHR)
- UK's National Institute for Health and Care Excellence (NICE) makes recommendations based on cost-effectiveness findings from our research

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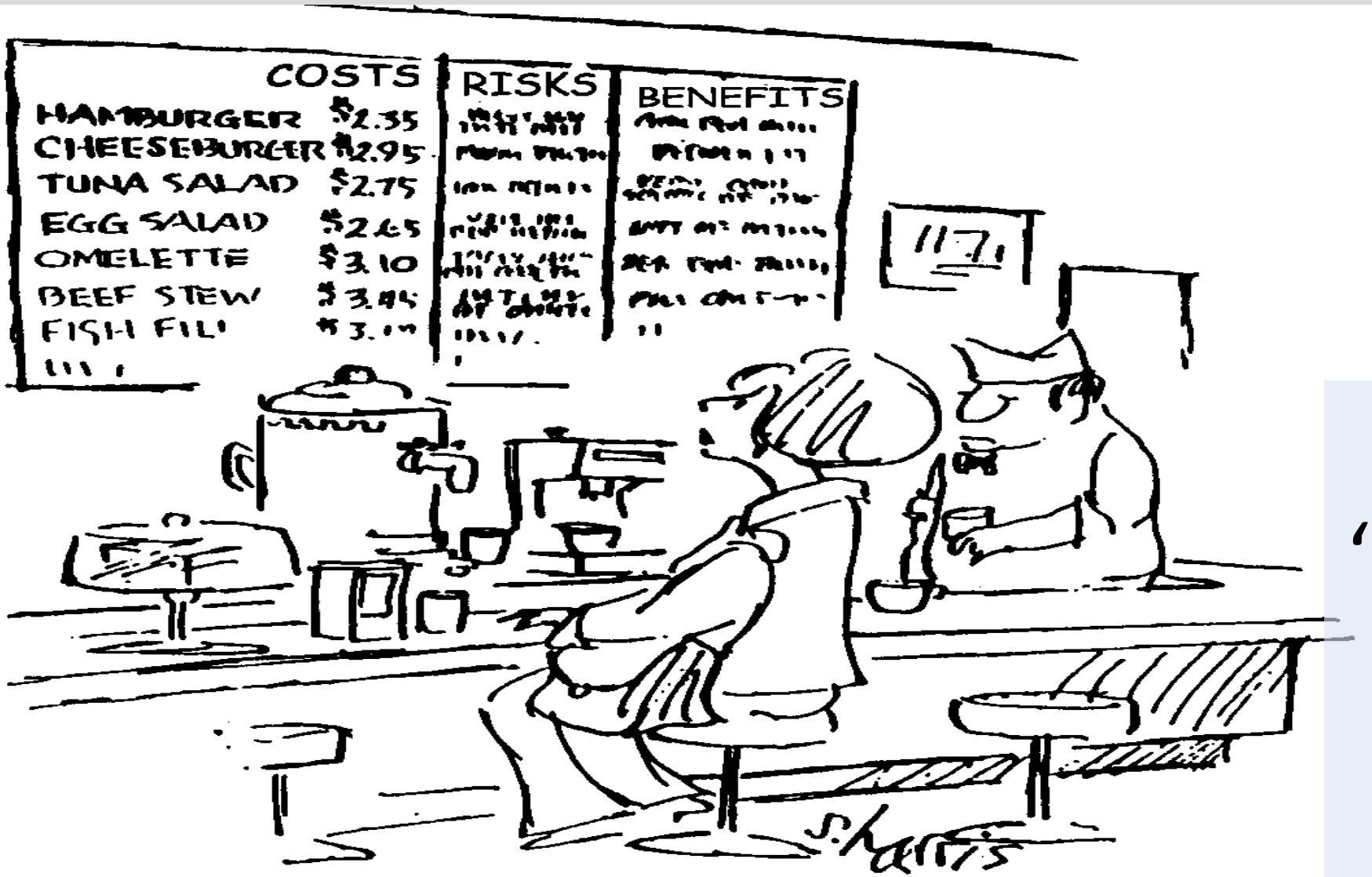
Market Failure in health



We need to ‘Reconstruct’ the missing market

Aim of a National Health Service

"Securing the provision of **comprehensive**, **high quality care** for **all those who need it**, regardless of their ability to pay or where they live"

- Given the limited funds, **trade-offs** have to be made between breadth of healthcare provision, quality and equity
- And **some mechanism** is needed to bring this about

Basis for priority setting???

- Capacity to benefit from treatment
- Family responsibilities/dependents
- Life expectancy with and without treatment
- Fair innings
- Waiting time
- Treatment received to date
- Benefit to society
- Cost
- Cause

Resource allocation mechanisms

- Need
- Discrimination (e.g. by age, non smokers …)
- Personal merit and social esteem
- Lottery
- Ability to pay (free market approach)

- Choose lowest cost treatments
- Choose treatments that are effective (Evidence based medicine)
- Cost-effectiveness (Economics based medicine)

Male cancer drug hits cost block

Men in Scotland with prostate cancer will not receive a life prolonging drug on the NHS because it is too expensive.

New cancer drug puts NHS under pressure

Chemotherapy drug not recommended on grounds of cost

800 Scots denied prostate cancer drug

'I can't have the drugs that will ease my cancer agony . . . because they cost too much'

Dying prostate sufferer's fury after health minister backs decision to deny treatment

Prostate cancer drug is refused to NHS patients

Documentaries

911: INSIDE THE PRESIDENT'S WAR ROOM

MONKEYS, RATS AND ME

PANORAMA: GPS: WHY CAN'T I GET AN APPOINTMENT?

THE PRICE OF LIFE

THE PRICE OF LIFE

On a finite budget, the National Health Service can't afford to offer patients every treatment on the market, so how does the nation decide which patients should be the winners – and who should be the losers? BBC Two has secured exclusive and unprecedented access to NICE (the National Institute for Health and Clinical Excellence), the controversial body that decides which drug treatments the NHS can afford. Its judgements have precipitated many bitter battles over the last decade but, for many, the people behind the process remain shrouded in mystery.

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What is Economics?

The scientific study of the choices made by individuals and societies in regard to the alternative uses of scarce resources which are employed to satisfy wants.

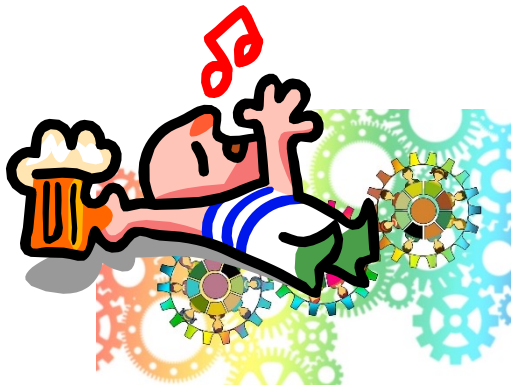
What is Health Economics?

Health economics is concerned with the problem of allocating health care resources under conditions of scarcity and uncertainty.

With increasing demands on NHS resources and limited funding, the economic impact of new treatments has never been more important or influential.

Allocation problem
Who do you think should get the liver?

A – Man with a young family – two children
B – Woman in hospital with only a few days left to live unless she gets the liver
C – Elderly woman, 80 years old
D – Middle aged man who has alcohol related liver disease
E – Recently retired woman



Questions for a new drug, intervention or service

- Does it actually work ?
  - Is it better than the existing ‘technology’ ?
  - “better” means more output, but how is output to be measured ?
- Can we afford to pay for it ?
  - How much will it cost ?
  - Is it worth spending more on this technology?
  - Is it worth transferring resources from another health care area to pay for this new technology?

How do we want to prioritise?

- **Explicit**
- **Open**
- **Involves the general public**
- **Considers equity and efficiency**
- **Includes local and national priorities**
- **Ethical**
- **Evidence-based**

Let’s dive into Economic Evaluation…

Economic evaluation concerns itself with choices

Systematic approach

Explicit and rational

Determines if a proposed change is good use of resources

Not simply a cost-cutting exercise

Economic evaluation is the comparative analysis of alternative courses of action in terms of both their costs and their consequences.

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Economic Evaluation

When undertaking an Economic Evaluation we need to:

- **Identify, measure** and **value** the **costs** associated with the interventions under assessment.
- **Identify, measure** and **value** the **outcomes** associated with the interventions being analysed.
- Compare the differences in costs, with the differences in consequences. This is an **incremental analysis**

Principles of economic evaluation

- Systematic Approach
- Identifying, measuring and valuing what is given up = cost
- Identifying, measuring and valuing what is gained = benefit
- Assess cost-effectiveness / cost-benefit
- Compare with alternative ways of using the same resources

Economic Evaluation

- Determine if a proposed change is good use of resources
- Explicit and rational
- Effective vs. cost-effective
- **Not simply a cost-cutting exercise**

Types of Economic Evaluation

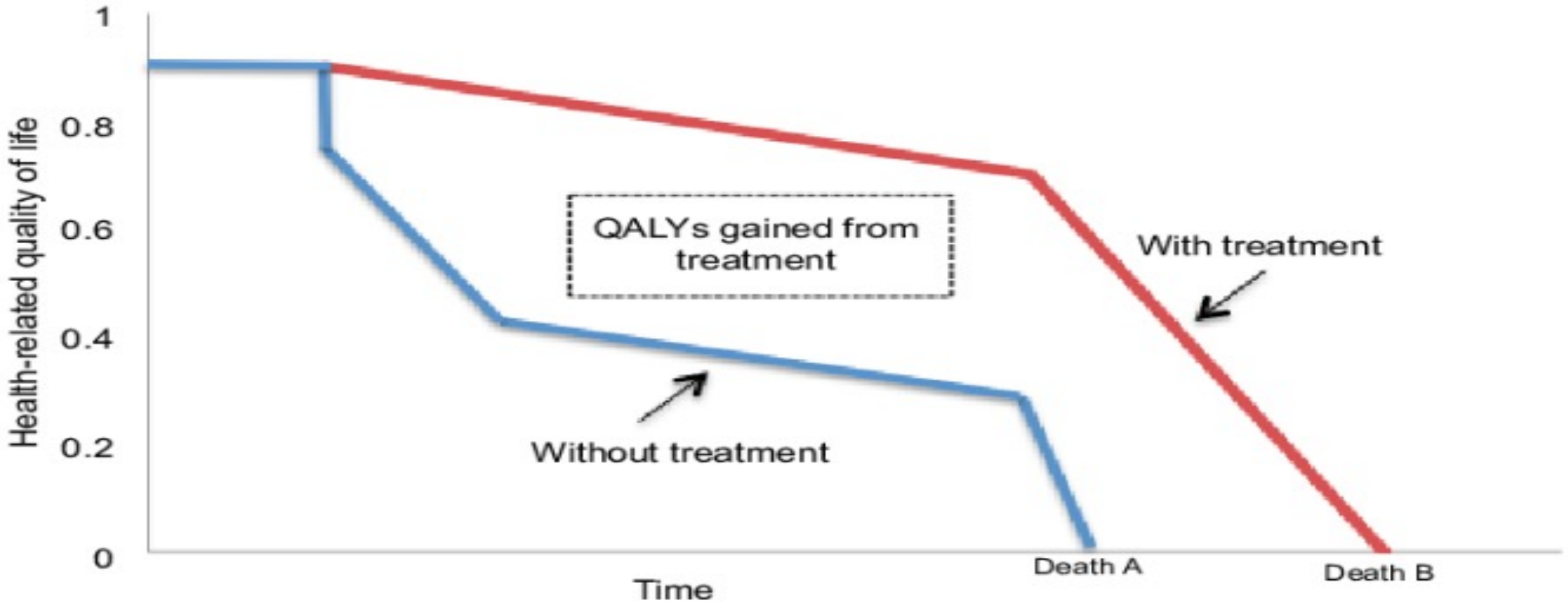
Type	Costs	Outcome/health benefits	Summary measure
Cost-effectiveness analysis (CEA)	Monetary (£)	Natural/clinical units	Cost per unit of outcome
Cost-utility analysis (CUA)		Quality adjusted life-years (QALYs)	Cost per QALY
Cost-benefit analysis (CBA)		Monetary (£)	Net cost benefit ratio
Cost-consequence analysis (CCA)		Various	Balance sheet presentation
Cost-minimisation analysis (CMA)		None	Alternative with least cost

In each, we want to compare the ***additional*** **outcomes** and ***additional*** **costs** of a 'new' intervention – against a comparator intervention (or no intervention if none exists)

Outcome measures in cost effectiveness analyses

- Examples of outcome measures reported are:
  - **Cases detected** (screening);
  - **Symptom-free days** (asthma);
  - **Cases prevented** (myocardial infarction)
  - **improvement in Strengths & Difficulties questionnaire (SDQ)** (child mental health)
- Broadest possible outcome measure in CEA is life years gained
- Incremental cost-effectiveness ratio (ICER):
  - **Cost per additional cancer detected**
  - **Cost per reduction in anxiety scale**
  - **Cost per additional life year gained**

UK's decision making body uses cost-utility analyses: Quality Adjusted Life Years (QALY)



mprovement in QALY.

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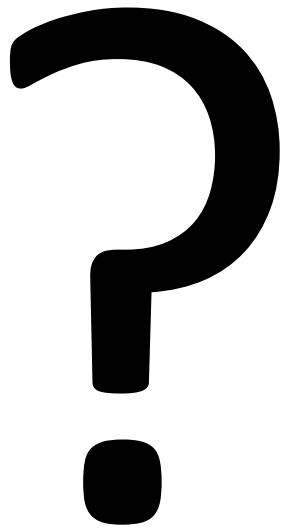
Euroqol Instrument used to generate QALYS

- Mobility
- Self-Care
- Usual Activities
- Pain/Discomfort
- Anxiety/Depression

1. No problems
2. Slight problems
3. Moderate problems
4. Severe problems
5. Unable / extreme

What is the UK Government willing to pay for an incremental QALY – one year in full health?



Should NICE's cost-effectiveness thresholds change?

We explore the ongoing debate around NICE's cost-effectiveness thresholds and what the future holds.

Blogs 13 December 2024

Additional Factors NICE Considers

Although QALYs are central, NICE does **not rely on them alone**.

Other factors include:

- **Severity of disease**
- **Unmet medical need**
- **Innovation of treatment**
- **Uncertainty in evidence**
- **Budget impact on the NHS**

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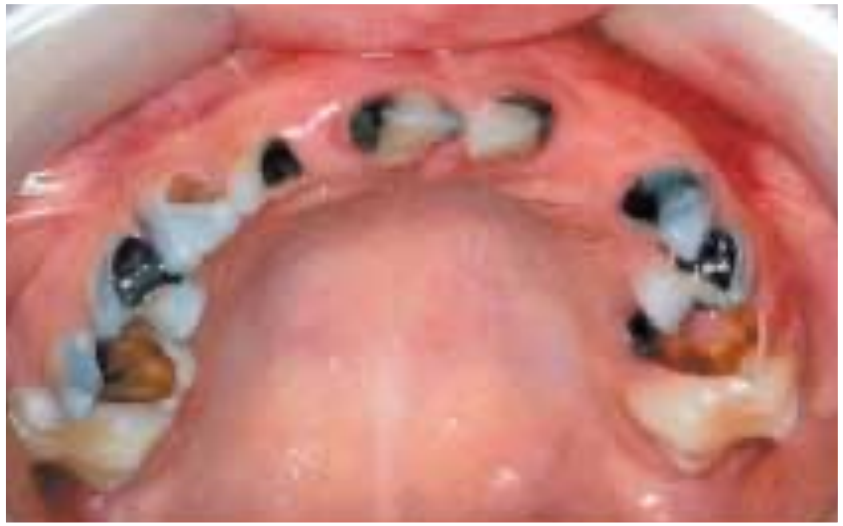
Deprivation is linked to shorter life expectancy

- **Deprivation is strongly associated with:**
  - Cardiovascular disease
  - Respiratory disease
  - Obesity
  - Mental illness
  - Dental decay (caries)

Cost analysis of a national supervised toothbrushing programme in Scotland

Y. Anopa, A.D. McMahon, D.I. Conway, G.E. Ball, E. McIntosh, L.M.D. Macpherson

Dental Decay

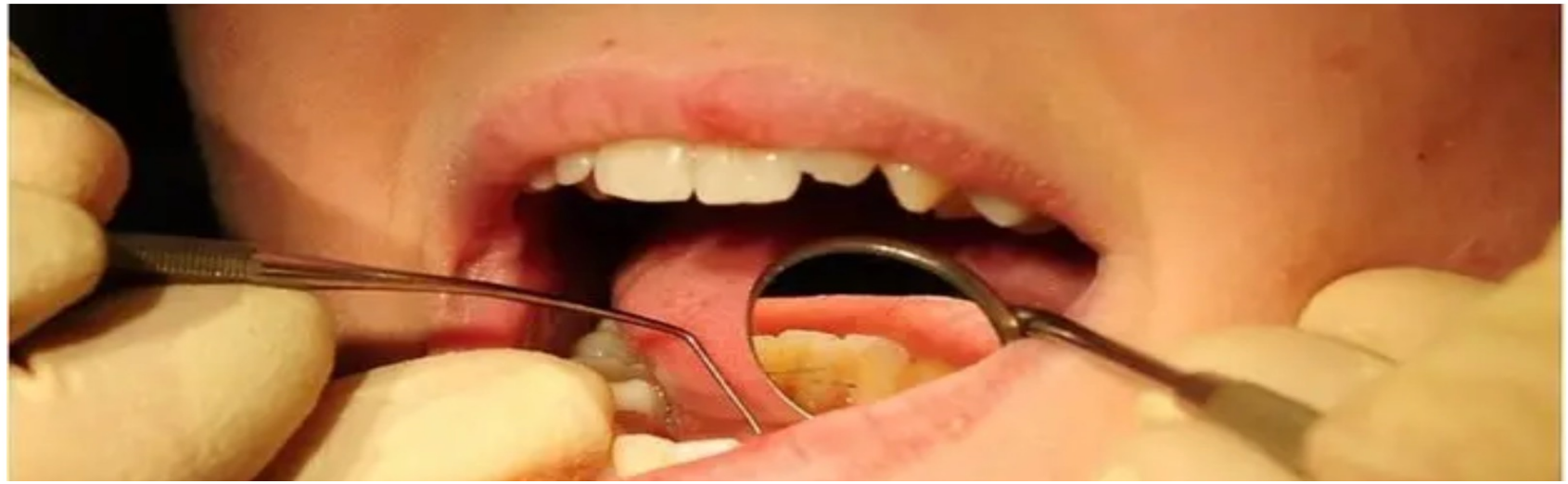


- **Dental decay (caries)** is one of the most common diseases of childhood impacting quality of life through pain, infection, diet, and loss of sleep
- Caries can lead to **time lost from school** for children and **time off work** for parents/carers
- Caries can be **effectively prevented** and controlled giving rise to substantial improvements in quality of life and child morbidity

The nursery tooth brushing programme represents a ‘win win’ scenario in terms of freeing up resources (reduced costs), gains in child oral health outcomes and reduced inequalities.

Childsmile dental scheme 'saves NHS £5m a year'

9 June 2015



New methods needed to reveal the societal benefit of investing in prevention

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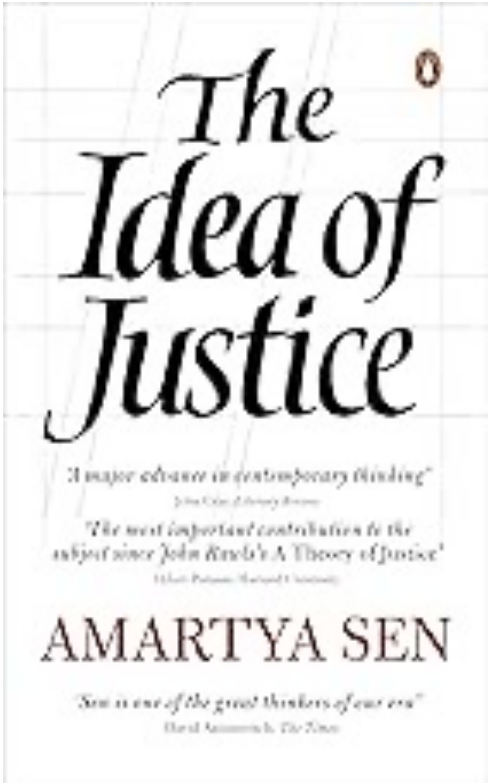
Recent Developments in outcome measures in health economics: Capability wellbeing

- Capability measures are conceptually linked to Amartya Sen's approach
  - Defines wellbeing in terms of an individual's ability to 'do' and 'be' the things that are important in life
- Approach focuses on wellbeing defined in a broader sense rather than health only



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Thank you for listening

Any Questions?

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EXERCISE

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Scenario

- You have been assigned a budget of USD 5 million as the Tanzanian Health Minister to spend on a public health intervention.
- You have four options to choose from…

Interventions

Intervention	Malaria prevention, test, and treatment	New chemotherapy for a rare genetic condition	Arthritis Treatment	HIV prevention program for young people
Who will benefit	Children- Under 5	Newborn babies	Older people (mostly women)	Young people aged 16 to 25
Number of people who will benefit	1 million	20	10,500	55,000
Effect on life expectancy	Increased	Increased-significantly	Null	Increased
Effect on quality of life	Increased	Increased-significantly	Increased-significantly	Increased
Cost per person	USD 5.00	USD 250,000	USD 476.20	USD 90.91
Total Cost	USD 5,000,000	USD 5,000,000	USD 5,000,000	USD 5,000,000