

Economic, social, cultural and organizational aspects of healthcare

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How limited resources in health care are allocated

Clinical efficacy v.s. justice v.s. cost-effectiveness - Example

The available budget is EUR **1 500 000**, the number of patients to be treated is 300

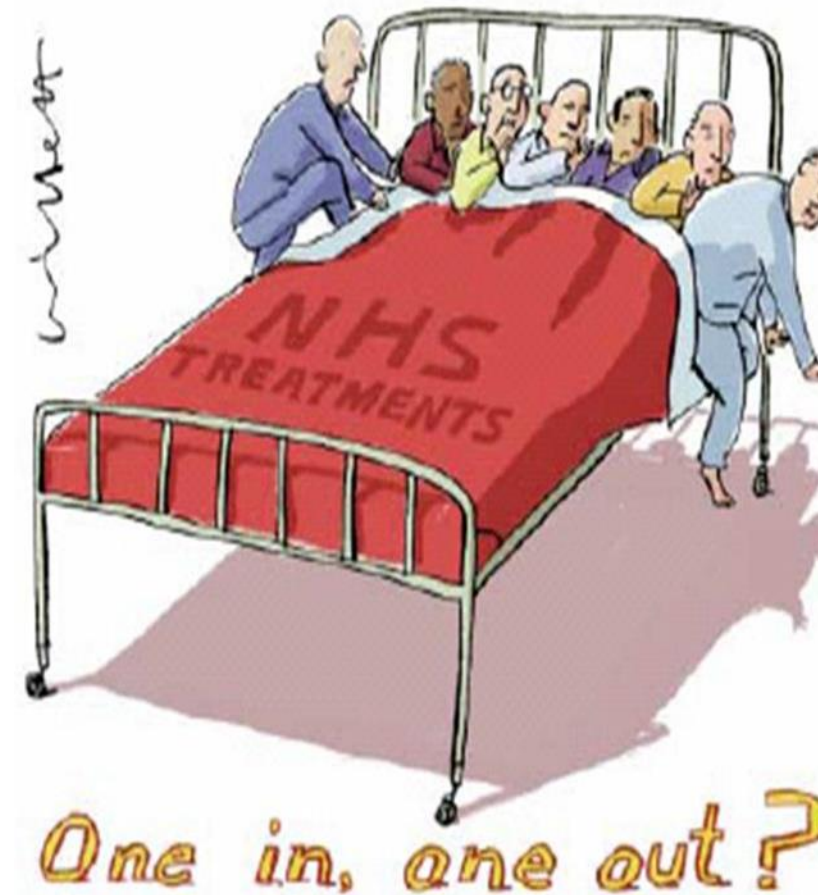
- Treatment options:
- "A" gives 3 years for 5,000 EUR (current practice)
- "B" gives 5 years for 6,000 EUR
- "C" will give 6 years for 15,000 EUR



Test

Which option is the 1) most clinically efficient, 2) the most nondiscriminatory, 3) the most cost-effective

Within a fixed budget constraint, if the healthcare system spends more on one thing, it has to do less of something else



Source: Peter Littlejohns, The Challenge of Health Care in Europe: "value for money"

Rationing: a regulated allocation of resources among possible users)

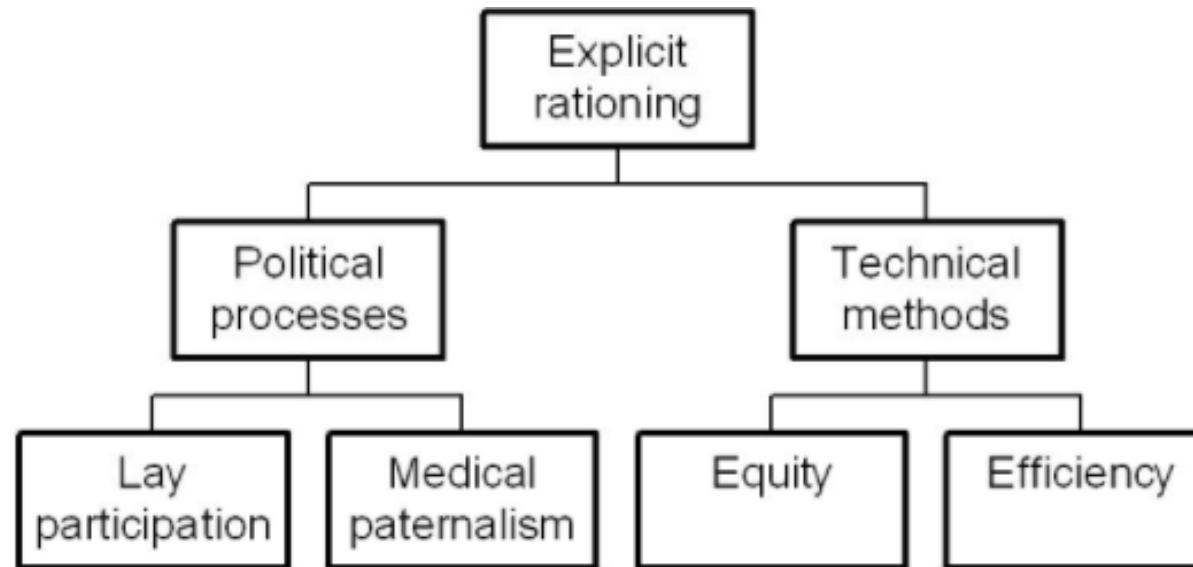
Implicit or explicit rationing?

- In both cases care is limited.
- Implicit means that neither decisions, nor the basis of decisions are clearly expressed.
- Explicit means, that decisions are clear, as is the reasoning behind those decisions

Forms of rationing

- Patients denied care they need, for example, deemed unsuitable or not urgent enough
- Patients selected because of characteristics, for example, most likely to benefit from treatment
- Patients encouraged or turned towards another service, for example, private care
- Needs not met immediately, for example, wait for appointments or waiting-lists.
- etc

Allocation of limited resources in health care



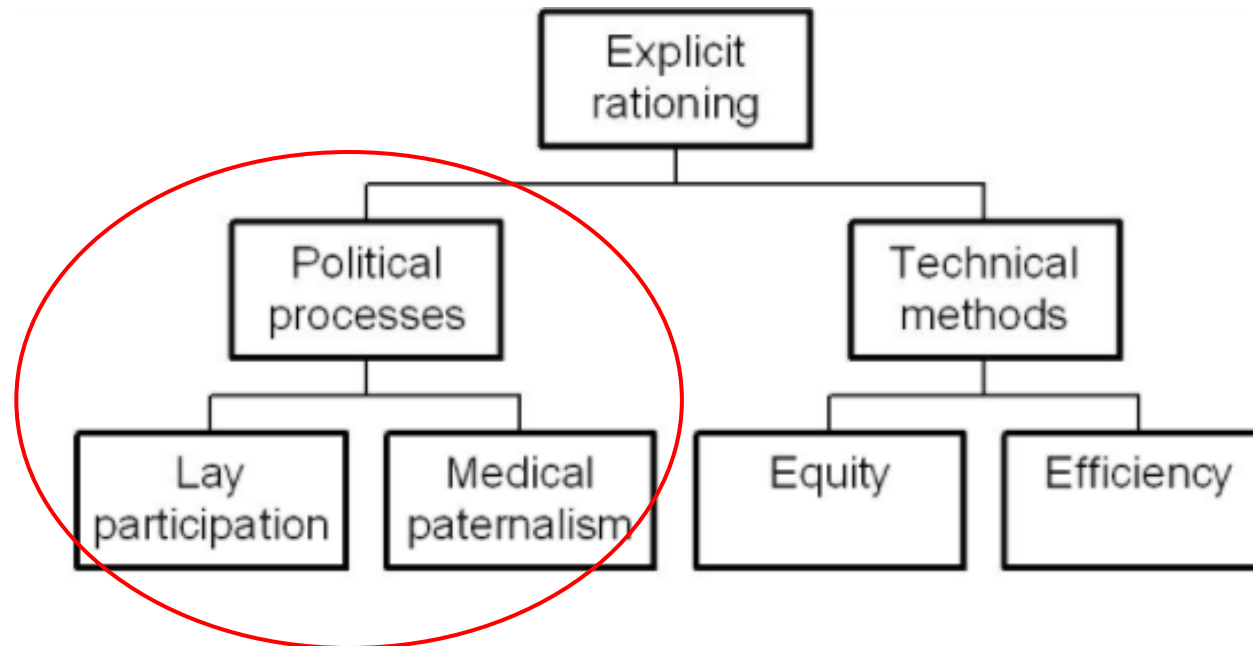
(Coast et al, Priority setting: the health care debate, John Wiley, 1996)

Example: there are several ideas to improve care for elderly / chronic patients by integrating care processes to decrease avoidable hospitalizations

1. To invest in e-health solution – common data bases where previous history of care is easy available for those who are in response for it now
2. To compensate travel costs for patients in rural areas for receiving specialist health care in capital city
3. To oblige General Practitioners (Family physicians) to actively invite (by phone, mail) such patients to regular visits

How to chose one as for all of them there are not enough money for all?

Allocation of limited resources in HC as political process



- * Lay (public participation) - what weight should be public views be given?
- * Medical paternalism - choosing a course of action in the patient's best interest but without the patient's consent
- Decision making in political process is used when technical methods could not be applicable. It must be transparent and structured (criteria!)

(Coast et al, Priority setting: the health care debate, John Wiley, 1996)

Transparency and clear criteria for political decisions

- Agreement on criteria (efficiency, costs, timing, level of technical complexity, longevity, stakeholders support, etc)
- Agreement on the relative importance (weight) of each of criteria
- Decision makers use that frame to evaluate each of proposal
- Decision = sum of individual structured decisions

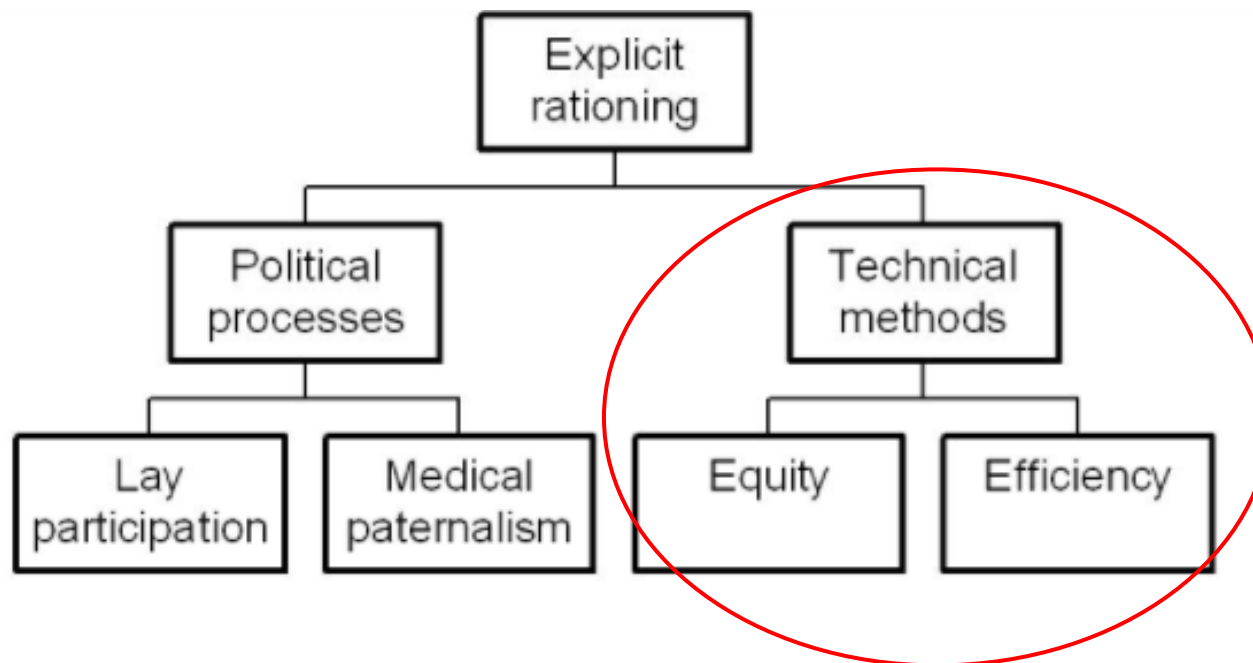
The process of decision making is transparent!

Another example: there is demand to include in reimbursement scheme several new interventions:

1. New blood pressure medication
2. Weight loss programm
3. Cancer screening program

Not enough money for all. The task is to chose one with highest health gain. Health gain is this case is supposed to be measurable (as well as costs)

Allocation of limited resources in HC technical methods



(Coast et al, Priority setting: the health care debate, John Wiley, 1996)

Economic Evaluation

- "... the comparative analysis of alternative courses of action in terms of both their costs and consequences."
 - Drummond, Stoddard & Torrance, 1987



4 types of economic evaluation

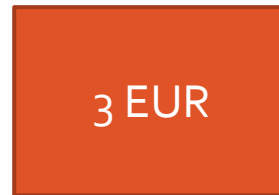
Type of analysis	Costs	Benefits
1. cost minimisation		
2. cost effectiveness		
3. cost utility		
4. cost benefit		

Costs

- Direct – linked to intervention
- Indirect – linked to missed income due to illness
- Intangible costs – hard to put a value – pain, suffering, loss

1. cost minimisation analysis

- Same medication by different manufacturers



4 types of economic evaluation

Type of analysis	Costs	Benefits
1. cost minimisation	\$\$\$	The same
2. cost effectiveness		
3. cost utility		
4. cost benefit		

2. cost effectiveness analysis

- Interventions A, B, C → results in common health outcome (e.g. reduction in blood pressure, cancer cases avoided, kilos lost, life years gained)
- Example – **weight loss programm (A)** un **medication for weight loss (B)** → results in lost kg
 - **A costs are 300 EUR, results 2 kg → costs per 1 kg = $300/2 = 150$**
 - **B costs are 1500 EUR, results 3 kg → cost per 1 kg = $1500/3 = 500$**

Cost effectiveness ratio is higher for A

4 types of economic evaluation

Type of analysis	Costs	Benefits
1. cost minimisation	\$\$\$	The same
2. cost effectiveness	\$\$\$	Natural units
3. cost utility		
4. cost benefit		

3. cost utility analysis

- Should be applied when different interventions with different outcomes needs to be compared (to allocate resources across whole spectrum of health care):
 - New medication → decreases blood
 - Screening programs → decreases the cases of breast cancer advanced stages
 - Kidney transplant → restores function
- what is ultimately **common outcome**? → additionally gained life years + added quality to life → Quality Adjusted Life Year (QALY)

Quality Adjusted Life Year (QALY) as health utility measure

- Number of years (+ 1; 2; 50...)
- Quality of life for those years (from 0 (worst) to 1 (max))
- $QALY = \text{number of years} \times \text{quality of life}$
- $QALY = 5 \text{ years} \times 1 = 5$
- $QALY = 5 \text{ years} \times 0,2 = 1$
- \rightarrow cost per QALY

Describing Health State Using EQ-5D

Mobility

- I have no problems in walking about
- I have some problems in walking about
- I am confined to bed

☒
☐
☐

Self-care

- I have no problems with self care
- I have some problems washing or dressing myself
- I am unable to wash or dress myself

☒
☐
☐

Usual activities (e.g. work, study, housework, family or leisure activities)

- I have no problems with performing my usual activities
- I have some problems with performing my usual activities
- I am unable to perform my usual activities

☐
☒
☐

Pain/discomfort

- I have no pain or discomfort
- I have moderate pain or discomfort
- I have extreme pain or discomfort

☐
☒
☐

Anxiety/depression

- I am not anxious or depressed
- I am moderately anxious or depressed
- I am extremely anxious or depressed

☐
☐
☒

Health economics is about technical methods of allocation of limited resources

- Health economists use an *economic framework* in order to make *recommendations* about how health care should be rationed *efficiently*.
- The promotion of *efficiency* (as defined by most health economists) leads to the production of more health.

4 types of economic evaluation

Type of analysis	Costs	Benefits
1. cost minimisation	\$\$\$	The same
2. cost effectiveness	\$\$\$	Natural units
3. cost utility	\$\$\$	Utility measure
4. cost benefit		

Calculation of QALY

- Additional years of life – 15
- Including 10 years of 100% quality (1.0)
- Including 5 years with 50% decreased quality (0.5)
- **$QALY = (10 \times 1,0) + (5 \times 0,5) = 12,5$**

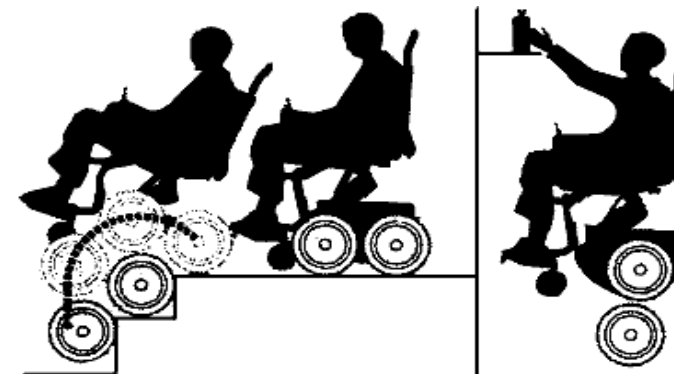
QALY costs: examples

Table 4. Cost per QALY league table¹

Intervention	Extra cost per QALY gained
GP advice to stop smoking	270
Hip replacement	1,180
Cholesterol testing and treatment (all adults aged 40–69)	1,480
Kidney transplantation (cadaver)	4,710
Home haemodialysis	17,260
Hospital haemodialysis	21,970
Erythropoietin treatment for anaemia in dialysis patients (assuming 10% reduction in mortality)	54,380
Neurosurgery for malignant intracranial tumours	197,780

Which health care program is the most cost-effective?

- A new wheelchair for elderly
- Special post natal care

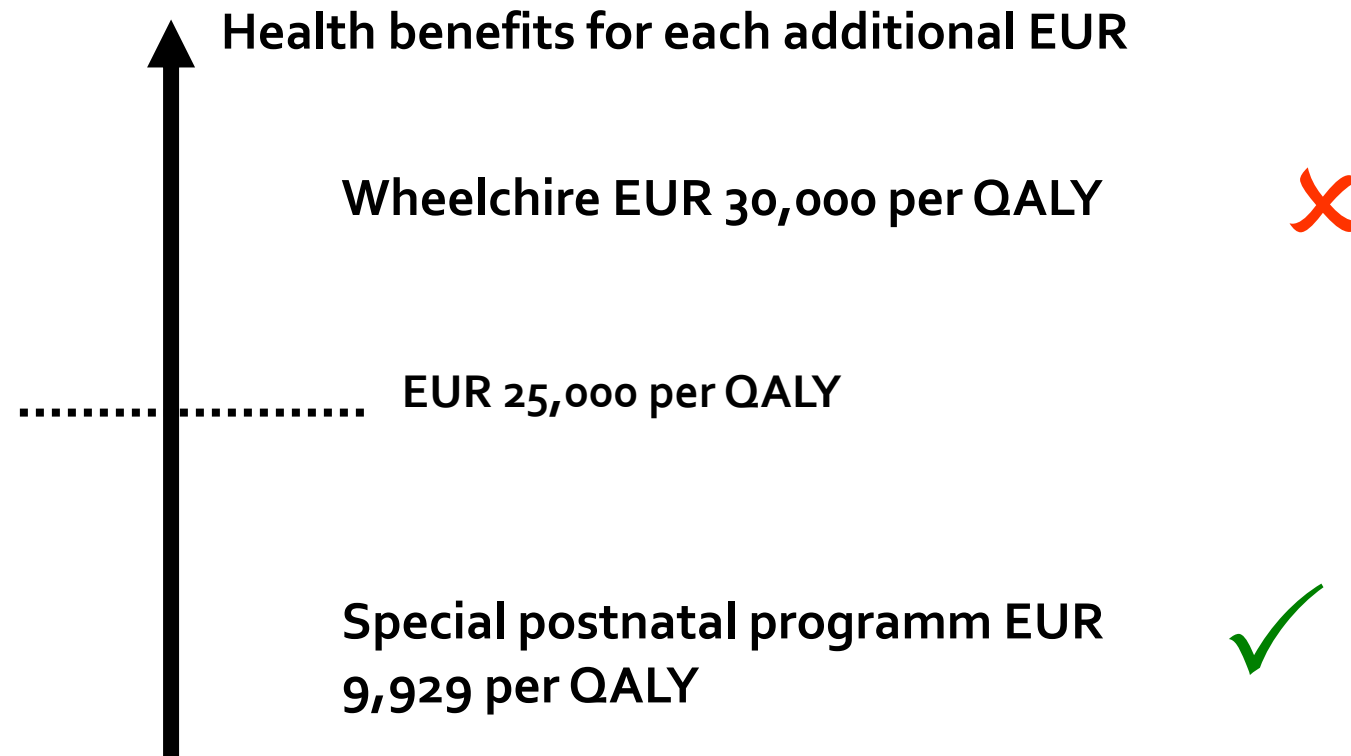


Which health care program is the most cost-effective?

- **A new advanced wheelchair for elderly**
 - Increases quality of life = 0.1
 - 10 years benefit
 - Extra costs: EUR 3,000 per life year
 - $\text{QALY} = 10 \times 0.1 = 1 \text{ QALY}$
 - Costs are $10 \times \text{EUR } 3,000 = \text{EUR } 30,000$
 - **$\text{Cost/QALY} = 30,000/\text{QALY}$**
- **Special post natal care**
 - Quality of life = 0.8
 - 35 year
 - Costs are EUR 250,000
 - $\text{QALY} = 35 \times 0.8 = 28 \text{ QALY}$
 - **$\text{Cost/QALY} = 8,929/\text{QALY}$**



Threshold approach to priority setting



The Threshold – "willingness to pay"

Valsts / Country	IKP/uz iedz. / GDP per capita EUR	Sliekšnis par QALY / Threshold EUR
Sweden	52 614	57 000
United States	49 332	15 000 - 75 000
Netherlands	48 887	80 000
Canada	47 795	15 000 - 75 000
United Kingdom	39 281	22 645 - 33 968
Latvia	13 647	14 228,72*

**PVO rekomendācija zemu un vidēju ienākumu valstīm - 1-3 IKP uz 1 iedzīvotāju
konkrētā valstī**

**WHO recommends 1-3 national GDP/per capita as threshold for low and middle
income countries**

Example

- Patient X (living in country XYZ) has a serious, life-threatening condition.
- If he continues receiving standard treatment he will live for 1 year and his quality of life will be 0.4
- If he receives the new drug he will live for 1 year 3 months (1.25 years), with a quality of life of 0.6.
- If the cost of the new drug is assumed to be €10,000, standard treatment costs €3,000 (for whole treatment period)
- Country XYZ could afford to pay €15,000_EURO for 1 QUALY (threshold)

- Will be this new treatment considered cost effective in country XYZ?

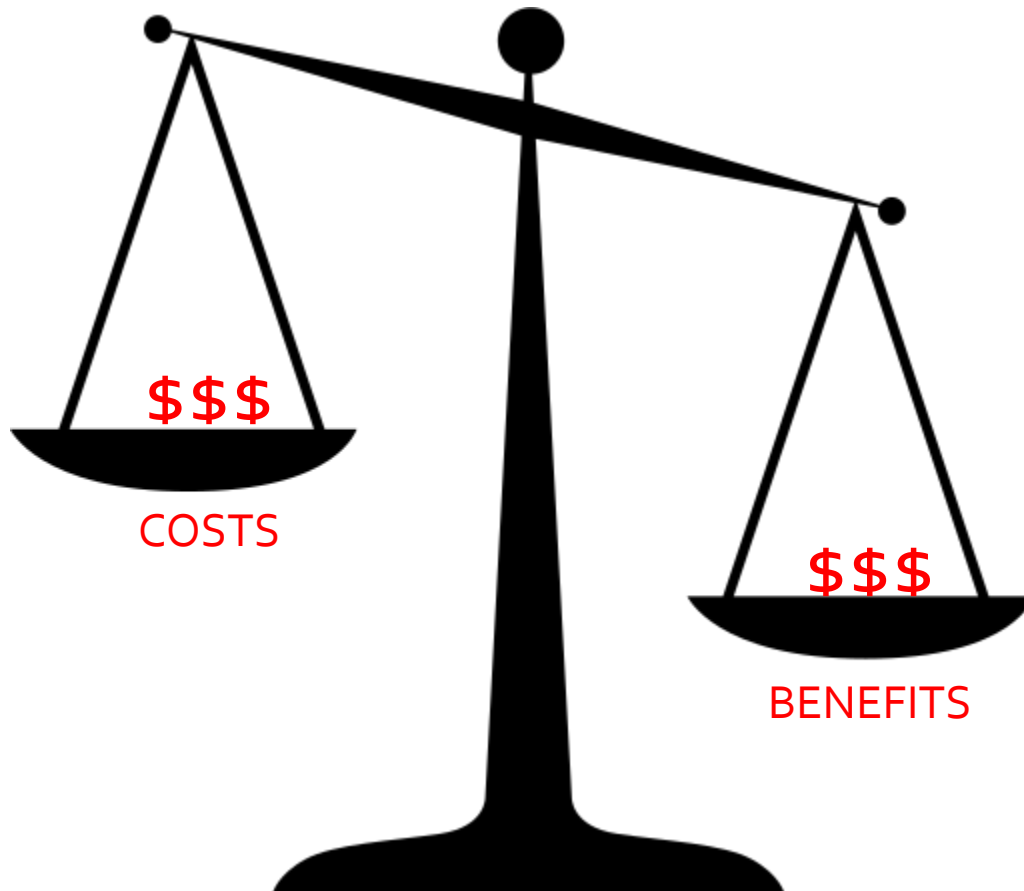
Explanation: how a QALY is calculated

- The new treatment is compared with standard care in terms of the QALYs gained:
- Standard treatment: $1 \text{ (year's extra life)} \times 0.4 = 0.4 \text{ QALY}$
- New treatment: $1.25 \text{ (1 year, 3 months extra life)} \times 0.6 = 0.75 \text{ QALY}$
- Therefore, the new treatment leads to 0.35 additional QALYs (that is: $0.75 - 0.4 \text{ QALY} = 0.35 \text{ QALYs}$).
- The difference in treatment costs (EUR7000) is divided by the QALYs gained (0.35) to calculate the cost per QALY.
- So the new treatment would cost EUR20,000 per QALY. (**above threshold**)

Utilitarianism problem manifestations in case of QALY

- The QALY approach adopts a utilitarian framework:
 - that is, it attempts to maximise the benefits to society from health care spending.
 - that is, the intervention that maximises health gain to society per EUR spent is the preferred option.
- The QALY approach requires that limited health care resources should be allocated to those individuals that will produce the greatest QALY gain, regardless of: age, sex, ethnicity, class, income, anything else, except ability to benefit from health care.
- An intervention that improves the life of one person by 1 QALY is valued the same as an intervention that improves the life of 100 individuals by 0.01 QALYs. (insensitivity to the distribution of the benefit)
- An intervention that improves the quality of life in a smoking-related disease by 0.1 is valued the same as an intervention that improves the quality of life of a congenital disease by 0.1 (insensitivity to role of individual responsibility)
- An intervention that improves the quality of life of one severely ill patient from 0.1 to 0.2 for exactly 4 years is valued the same as an intervention that improves the quality of life of a generally healthy patient from 0.8 to 0.9 for 4 years.(insensitivity to severity of disease)

4. cost benefit analysis



- In performing this type of analysis all benefits must be expressed in monetary terms (\$\$\$)
- Problems with it:
- Costs for health care depend on «willingness to pay»
 - Benefit from the treatment of disease
 - Avoided costs preventing disease
- Cost of 'human capital' - income lost because of disease
 - ... too complicated to be used as routine assessment...

4 types of economic evaluation

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One in six cancer patients is being denied drugs recommended by doctors



NHS patients denied new lung cancer drug after another NICE deadlock



Richard Staines

January 22, 2020

Certain untreated lung cancer patients on England's NHS will have to make do with older drugs after NICE ruled in final guidance that AstraZeneca's Tagrisso (osimertinib) is not cost-effective in this use.

NICE has continued to reject Tagrisso in first line epidermal growth factor receptor (EGFR) mutation positive non-small cell lung cancer in adults, despite an appeal from AZ after rejection in draft guidance published in July.

The Telegraph

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Cystic Fibrosis sufferer denied 'chance of life' drug by NHS

Cystic Fibrosis sufferer is being refused a "chance of life" drug by the NHS despite the manufacturer offering it to her for free, it has emerged.



Caroline Cassin, 29, who suffers from Cystic Fibrosis (CF) has been offered a new wonder drug free of charge for a limited period by the makers but her NHS hospital is refusing. Photo: Caters

3:05PM GMT 28 Oct 2012

237 Comments

A 29-year-old woman will die without a new drug that the NHS is refusing to provide despite the manufacturer offering it to her for free, it emerged today.

Caroline Cassin, 29, who suffers from Cystic Fibrosis (CF) has been offered a new drug free of charge for a limited period by the makers but her NHS hospital is refusing.

Her family say she will die soon without it, yet managers at Heartlands Hospital in Birmingham say it would be unethical to provide the drug under the deal, only for it to be withdrawn later.

The drug, Kalydeco also known as Ivacaftor, costs £182,000 per patient per year, and works for five per cent of people with CF who have a certain defective gene, around 270 people in England.

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What title, keywords citystate indeed

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Executive Openings!

Conclusions

- No single best method
- Preferably technical methods, but political process could not be avoided
- Political process also could be transparent and based on clear criteria
- Bedside decisions is decisions to allocate insufficient resources
- Health data intelligence could lead to evidence based managerial decisions in evidence based health care environment



Clinical efficacy v.s. justice v.s. cost-effectiveness - Example

The available budget is EUR **1 500 000**, the number of patients to be treated is 300

- Treatment options:
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Test

Which option is the 1) most clinically efficient, 2) the most nondiscriminatory, 3) the most cost-effective

Clinical efficacy v.s. justice v.s. Cost-effectiveness

Treatment option	Cost EUR	Clinical efficacy (additional life years)	Justice – the possibility of receiving the same treatment for everyone within the budget (number of patients treated)	Cost-effectiveness – total number additional life years gained within existing budget
A				
B				
C				

Give the right answer in e-studies (see test)