

Principles of country-level TB modelling: 6. Valuation

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Principle #6: Validation

Modelling should estimate a rich set of results

- 6.1 Analyses should report summary measures of health benefit (eg DALYs, QALYs)
- 6.2 In addition, analyses should report policy consequences for a wide range of outcomes
- 6.3 Analyses should reflect local opportunity costs, and disaggregate total cost estimates
- 6.4 Analyses should explicitly consider any capacity limitations
- 6.5 Sensitivity analyses should be conducted around different valuation assumptions
- 6.6 Analyses should investigate the impact of different time horizons

6.1, 6.2: Outcome measurement – what to use?

- Economic evaluation is built upon the framework of welfare economics – has as its objective maximization of society's **welfare**, which is judged on the basis of **individuals' subjective preferences**.
- However, there is a problem: since Arrow (1951) it has been recognized it's **impossible to aggregate preferences** for social choice, without violating core but reasonable assumptions
- What to do?
 - CBA appeals to **Kaldor-Hicks criterion**: assume winners can hypothetically compensate the losers from a decision
(often problematic, especially in health care – compensate for lost health/death?)
 - Base interpersonal comparisons on outcomes other than individuals' utilities (an **extra-welfarist** approach): but of what?

6.1, 6.2: Outcome measurement – what to use?

- In health care seems reasonable that “health gain” is a **principal objective** (though not necessarily the only one)
 - QALYs/DALYs **generic measures** allowing comparisons across services; compare health gains vs health opportunity costs
 - Societal valuation of health may depend upon how it is distributed; conceptually easy to include **health equity**, technically challenging.
- Nobody believes health is all that matters, but **how to decide what else could be included** (e.g. productivity, financial protection, educational outcomes, process measures etc.)?
- Would need to know:
 1. **What should these be?**
 2. How they can be **measured and traded-off with health?**
 3. **Who decides** these trade-offs?

6.3: Reflect local opportunity costs and disaggregate total costs

- To include other outcome measures **implies willingness to incur population health losses** to improve other outcomes
 - Problematic (n.b. Arrow) – who should make this call? Not the analyst.
- An **“impact inventory”** listing all non-health impacts is useful: as **input to decision-making** processes
(recommended by 2nd US Panel on Cost-effectiveness, 2016)
- Importantly, should recognize there are likely to be **opportunity costs in terms other outcomes**
 - e.g. favour TB treatment because of childhood education benefit but where are resources drawn from (perhaps from vaccines)
 - What matters is the net effect vs other alternatives forgone.

6.3: Reflect local opportunity costs and disaggregate total costs

- An example:

Attributes	Investment	Forgone	Net effects
	Lucentis for diabetic macular oedema (£80m pa)	Expected effects of £80m pa	
QALYs	3,225	- 6,184	-2,959
Wider social benefit	£85.2m	- £49.8m	£35.4m

- Wider social benefits is **net production**: paid+unpaid production less non-health consumption
- Is £35.4m WSB worth -2,959 QALYs? It's for mandated decision-makers to decide (MOH, Treasury)
 - Can be informed by estimates of “consumption value of health”: is it < £11,900 per QALY?

(Drummond et al 2016 'Methods for the Economic Evaluation of Health Care Programmes')

6.4: Explicitly consider capacity constraints

- Disaggregating costs helps to assess not only what drives costs (costs not inherently important), but which **resources are consumed** when delivering interventions
 - Different kinds of resources can be relatively more or less constrained with different health opportunity costs when employed
- Since CEAs are concerned with net health benefit, we need to carefully consider the impact of capacity constraints (if known) on net health improvement
- However, there are likely trade-offs:
 - Analyses reflecting reality in a **specific setting** vs **generalizability** to inform choices across settings
 - **Short-run relevance** (where resources are fixed) vs **long-run representative** (where they can be altered)

6.5: Sensitivity analysis on valuation assumptions

- In my view there is need for caution here:
 - If this is **reflecting uncertainty** as to estimates of non-health outcomes, great.
 - If it's **how outcomes are combined** to provide summary measures of cost-effectiveness, don't think that is the job of analysts.

6.6 Impact of different time horizons

- In principle, we should model the **time over which costs and effects differ** between interventions (longer is better)
- Clearly, for practical purposes, for infectious diseases some choice of time horizon is required.
 - Recommendation to investigate choice of time horizon on decisions is good (due to discounting, costs and outcomes into the future will have less influence on current decisions)
- In addition, useful to consider the **time profile of costs and effects**
 - E.g. if costs are upfront and (uncertain) future benefits this could have important implications for policy

Summary

- Need to be careful to not select outcomes due to particular interest in a disease area (eliminate catastrophic costs in TB but not in HIV?)
- What we gain should be valued in the same way as what is forgone (should be interested in net effects)
- The role of economic evaluation is to guide rather than dictate – but it's useful to consider its role in mandated policy processes
- Aim for consistency across decisions (in TB and other areas of health care)