Pitfalls of effectiveness evidence …and how to avoid them

Neill Booth

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4.
VAIKUTTAVUUSTIEDON SUDENKUOPAT

Neill Booth & Leena Tervonen

OIVALLUS: *Vaikuttavuusterminologia on eritasoista ja epäyhtenäopivaa tieteellisessä kirjallisuudessa.*

SEURAUS: *Vaikuttavuustutkimuksia vertailtaessa käsitteiden epäyhdenmukaisuus aiheuttaa ongelmia tutkimustulosten hyödyntämisessä ja arvioinnissa.*

Aika ajoin tietyt käsitteet ja niiden ympärille kietoutuvat tiedonmuodostuksen tavat saavuttavat vallitsevan aseman tutkimuksen kentällä ja leviävät trendinä yli tieteenalarajojen. Niin on käynyt vaikuttavuuden käsitteelle ja siihen liittyvälle tutkimukselle. Alun perin luonnontieteistä lähtenyt ja vaikutusten mittaamiseen keskittynyt tutkimuksen tapa on laajentunut fysikaalisten ilmiöiden kentältä myös yhteiskunnallisten ja poliittisten ilmiöiden piiriin.[1] Erityisesti 1960-luvulla kukoistanut suunnitteluoptimismin kausi ja tutkimusperusteinen hyvinvointivaltion kehittäminen viitoittivat tietä vaikuttavuustutkimuksen nousulle.[2] Yhteiskunnallisten toimien vaikuttavuuden arviointitarpeeseen ovat vaikuttaneet myös 1980-luvulta alkaen levinnyt uusiberalistinen ideologia ja uuden julkisjohtamisen malli (*new public management*) sekä niiden mukanaan tuoma pyrkimys tehostaa toimintaa esimerkiksi arvioinnin avulla.[3] 1990-luvun lopusta lähtien esimerkiksi lääke- ja terveysteknologiaa-

1 Alexander 2008.
2 Radin 2019, 194.
3 Rajavaara 2007; Alastalo ym. 2014.

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Take-away messages

- **Terminology** can be misleading, so be careful!
- **Effectiveness** research typically does **not** offer a simple, holistic answer to a complex question, it offers a partial one!
- **Cost-effectiveness analysis** often does **not** offer a simple set of answers to what is often a horrendously complex est of questions!
- Incentives exist for government and industry to work together in the pursuit of **profit**, as well as any interest in the pursuit of 'health'!
- If you doubt the evidence, **inform** people and then **act** accordingly!

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5 pitfalls of effectiveness and cost-effectiveness

1. Originating in engineering, **methods spread** to social science & health
2. Similar **terminology** is used in all applications, often **inappropriate**ly
3. **Measurement** in the health sector is more than challenging
4. **Evaluation** in the health sector is more than challenging
5. **Assuming** all research is "better than no evidence" or "good enough"

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Terminology

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Some probelms with terminology?

Pharma -related terms	Plain-language alternative:
breakthrough designation	expedited review, accelerated approval and special advice
accelerated approvals	reduction in safeguards pertaining to the robustness of evidence
most plausible	most reasonable, most probable, or most believable
surrogate endpoints	**partial** and/or potentially **misleading** outcome measures
substantial evidence	one "adequate well-controlled clinical trial"
clinical trial	anything from a large parallel arm RCT to an observational study
single-arm trial	case series study design, which can be highly prone to biases
redactions	figures or calculations which are **hidden** from the public
maximising health	maximising a surrogate for health, estimated QALYs
value for money	costs (e.g., €) per unit of effectiveness (e.g., a QALY estimate)
patient access to medicines	**market** access for pharmaceutical companies
…	…

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Effectiveness evidence, in principle

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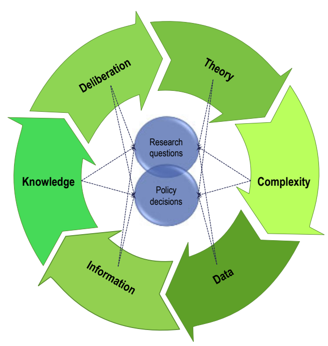
In principle, a fantastic decision-making cycle



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Vaikuttavuus sosiaali- ja terveydenhuollossa: https://andor.tuni.fi/permalink/358FIN_TAMPO/hb336c/alma9911346609305973

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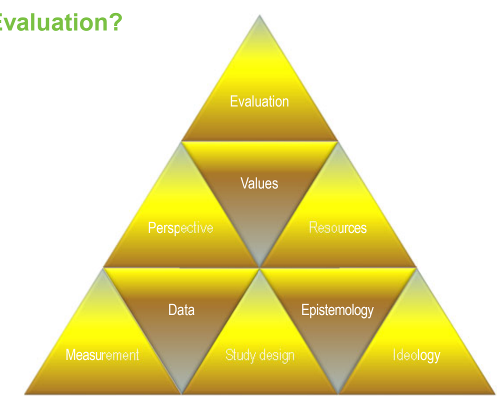
Evaluation?



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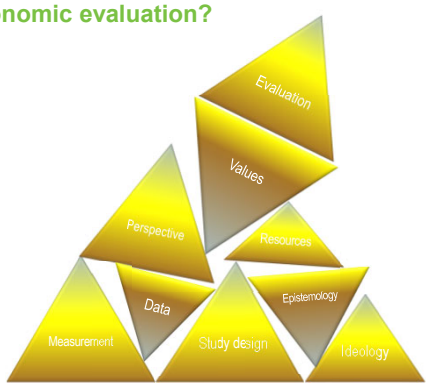
Economic evaluation?



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'Measurement', in practice

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Are QALYs (and 'cost per QALY') the answer?

- QA*LYs are more a **family of approaches** than a single 'measure' of quality*duration
- Most 'cost per QALY' -**estimates** are not typically directly comparable with each other
- QALYs (or CPQs) are a fairly central factor in decisions in **only a few countries**
- Using a 'cost per QALY' approach is, like all CEA, dependent on the estimates of "costs" **and** "effectiveness"
- Industry estimates may be biased
- Robust / independent estimates are often hard to obtain, often very resource intensive

Drummond, M. Value Sets for EQ-5D-5L. Springer Nature; 2022 and https://www.congress.gov/bill/118th-congress/house-bill/485/text

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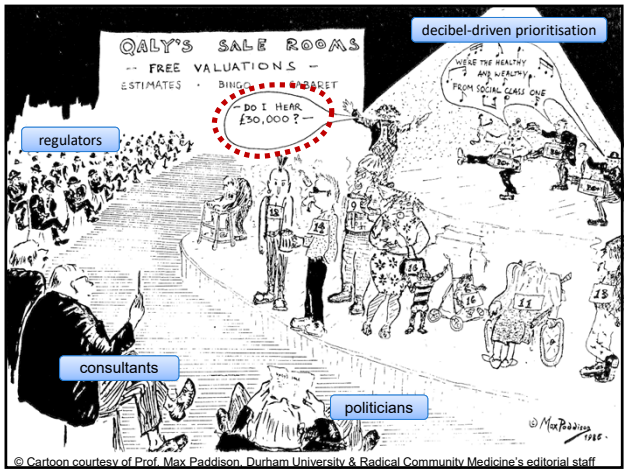

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Thresholds (CETs): Are they fact *and* fable?

1. NICE committees **do not** "*use a precise maximum acceptable ICER above which a technology would automatically be defined as not cost effective or below which it would.*", but…
   1. CETs (e.g., multiple CET ranges) have been used by NICE (in some way)
   2. CETs are part of the NICE committee's deliberation, **but…**
   3. Final deliberations **not** public, we don't typically know what has happened…
2. The way NICE uses **and sets** thresholds likely reflects additional considerations, beyond stated QALY-maximisation objectives
3. Forty years ago, a cost-per-QALY approach seemed like a great **idea**, but the idea needs great **data** and great **analysis** and…

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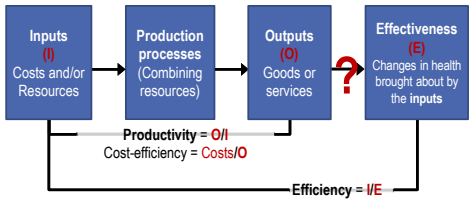
An often impossible input-output model?



[A fundamental dilemma in health care is that little is actually known about the relationship between **inputs** and **changes in health status**]*

*Sintonen & Pekurinen. Terveystaloustiede. Helsinki: Sanoma Pro Oy; 2009, p. 56

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GIGO

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QIQO

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Evidence, in practice, and trust…

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Trust The Evidence?

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Trust The Evidence?

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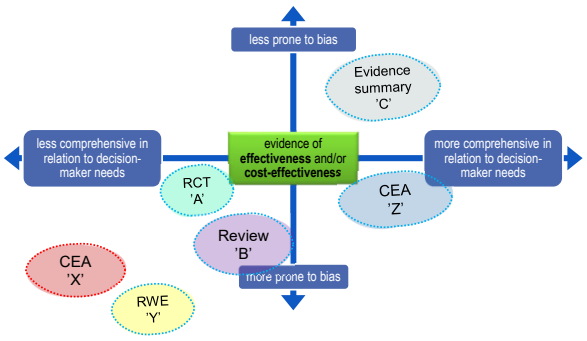
Interrogate the evidence!



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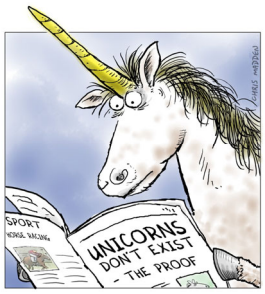
Ways forward for pharmaceutical reimbursement?



- Data, Study design, Analysis, and Research can be misleading, but that is not always the case…
- **Clarity**
  - Define terms and concepts clearly and contextually.
- **Transparency**
  - Be open about the contents and limitations and uncertainties of evidence
- **Honesty**
  - Avoid overstating the applicability or certainty of findings.
- **Humility**
  - Recognize the limitations of research and the potential for error or misinterpretation

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If the pitfalls remain?

1. Understand that assesment of effectiveness and cost-effectiveness in health care often faces **insurmountable problems**, i.e., incertitude*
2. Understand that CEA is an enigma:
   1. At best it offers a partial and blinkered assessment of efficiency
   2. At the same time, it can be useful!
   3. Tends to be static, tends to ignore budget impact and affordability
3. Some of NICE's thresholds almost certainly **prioritise specific groups** (patients receiving expensive new medicines), as well as prioritising drug companies, over other patients

*intractable forms of ignorance, ambiguity and uncertainty

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One solution?

- Set a cost-effectiveness threshold (CET) of €**10**000 (if budget impact likely to exceed, e.g., 1 million euros), **but…**
  1. Check the evidence thoroughly!
  2. Don't **rely** on ICERs and CETs to give you the information you need!
  3. Use the evidence as part of an open deliberative process!
  4. Trust that pharmaceutical companies will be concerned about patient **access!**

*intractable forms of ignorance, ambiguity and uncertainty

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