Lies, damned lies and cost-effectiveness: Open-source models are essential if cost-effectiveness analyses are to be widely accepted

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Individual treatment decisions can be difficult, and the allocation of healthcare resources contentious

Condemned to an early death
Rationing body tells liver cancer victims
Daily Mail, November 19, 2009

Doctors' outcry as Nice bans cancer superdrug
Daily Mail, August 7, 2008

NICE SPENDS MORE ON 'SPIN' THAN DRUG TESTS
Daily Mail, September 10, 2008

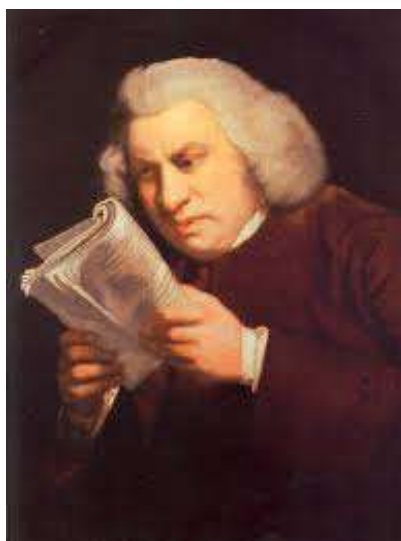# Models can be very useful in this process

- They synthesise evidence in an attempt recreate the "perfect" clinical trial

Created by Freepik

- They allow us to predict the future and estimate the total value of a technology

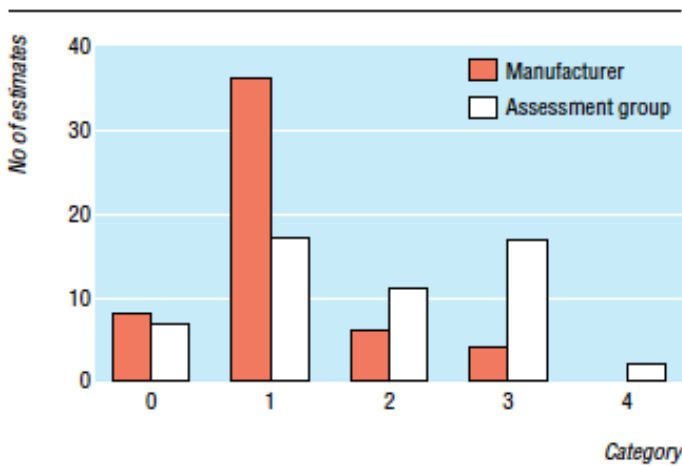

- They allow us to make trade-offs

But I, and others, are often skeptical of model results

They can be complicated, and may lack transparency

There are inevitable uncertainties, results are contestable, and judgements required

Miners AH. Comparing estimates of cost effectiveness submitted to the National Institute for Clinical Excellence (NICE) by different organisations: retrospective study. BMJ [Internet]. 2005;330(7482):60–5.

Those developing models may not be viewed as impartial

- "Some [cost-effectiveness analyses] are funded by companies that hope these analyses will put their products in a favourable light. Companies might even use particularly favourable analyses to jusify the prices of new drugs"

    NEJM Editorial on Journals Publication Policy for cost-effectiveness Analysis 1994

- "The ICER cost-effectiveness model systematically underestimates CV risk, and is not directly applicable to the population most likely to receive PCSK9i's"

    Amgen Response to ICER report https://bit.ly/2ICdRfe

Sunlight (or open source) is said to be the best of disinfectants*

*Louis Dembitz Brandeis (Supreme Court Associate Justice)

"To enhance the credibility and the value of health economic analyses, we argue that the computer model source code underlying these analyses should be made publicly available. Only with open publication is it possible for others to assess whether alternative assumptions, beyond those examined by the model authors, alter the model's findings…Making source code available shines a light on these otherwise black boxes and facilitates their complete evaluation and understandability"

Cohen JT, Wong JB. Interpretation of Cost-Effectiveness Analysis ? A Response. Medical Care 2017;55(11):912–4.

The UK Courts seem to agree (eventually)

"The problem is that, without the fully executable model, a consultee cannot check whether there are variables to which the model is particularly sensitive and make informed representations accordingly. As Mr Pannick put it graphically in reply, the consultee is left making shots in the dark, in circumstances where the **light** could so easily be switched on."

"The view I have come to is that, notwithstanding NICE's considered position to the contrary (to which in itself I am prepared to give some weight), **procedural fairness** does require release of the fully executable version of the model. "

UK Court of **Appea**l: Lord Justice Richards. https://www.nice.org.uk/guidance/ta111/documents/ruling-court-of-appeal-order-of-relief2

Open source models support a socially just system of healthcare resource allocation

Characteristics of procedural justice according to Dolan et al.:

1. **Voice**
2. **Neutrality**
3. **Consistency**
4. **Accuracy**
5. **Reversibility**
6. **Transparency**

Dolan et al. J Econ Behav Organ 2007;64:157-170

The alternatives to open source cost-effectiveness models

However, are open source models realistic?

Jaime Caro (Pros)   Renee Arnold (Cons)

Any subliminal messaging entirely intentional