How is Evidence of Health Opportunity Cost Used: Key challenges

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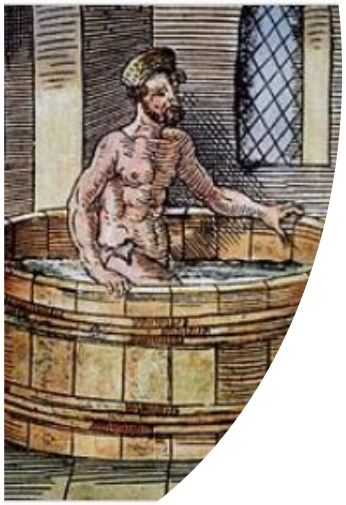
What are the challenges when deciding what to pay for a new treatment?

- Why is an estimate of health opportunity cost important?
- Why is it we pay more than health opportunity cost for new treatments?
- New technologies and novel mode of action – how are they different to existing treatments?
- What impact does politics (and aversion to denying treatment) have on decision-making?
- Static vs Dynamic Effects – how do we incorporate the concept of consumer surplus?
- Is there a conceptual framework which can define an optimal price for healthcare systems?

Willingness To Pay: Health Opportunity Cost



"… after Archimedes had stepped into a bath and noticed that the water level rose whereupon he suddenly understood that the volume of water **displaced** must be equal to the volume of the part of his body he had submerged."

….. When a new drug is approved by NICE, with the associated funding requirement, funds that would have otherwise be spent on other types of healthcare have now to be spent on funding this new drug**. Health opportunity cost is the health foregone from that displaced funding.**

"*There is a regrettable tendency for equity arguments to be conducted within a rhetorical framework in which it appears possible to "do good" at no opportunity cost whatever."*
Professor Alan Williams

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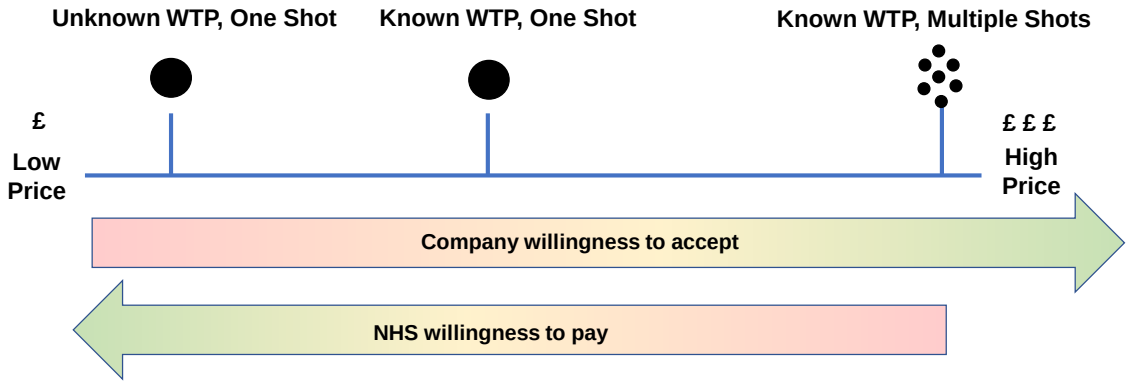
Monopolist v Monopsonist
No Market Clearing Pricing Mechanism

The more is known about WTP and the more 'shots' companies have, the higher the price



As companies will aim to price at the WTP (cost per QALY threshold) margin – it highlights the requirement to consider the opportunity cost

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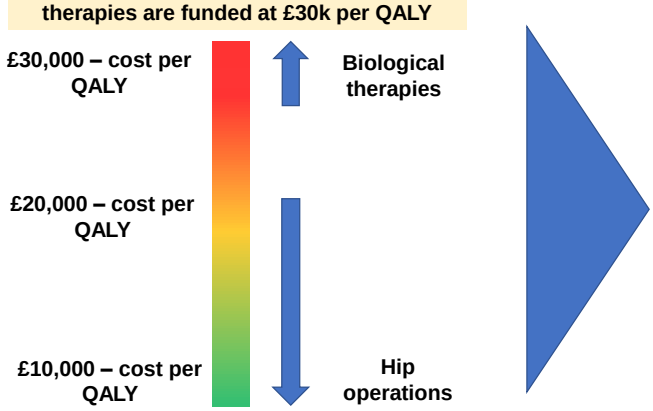
Opportunity cost transcends traditional healthcare silos – funding drugs has an impact on the holistic health budget

Example in RA - Hip replacements have tight eligibility criteria whilst biological therapies are funded at £30k per QALY



- Is there any evidence that other treatments are being restricted at a cost per QALY below £30k per QALY?
- Is there evidence that other programmes – e.g. public health, are producing health at a lower cost/QALY?
- How much would the NHS budget have to expand by in order to bring up eligibility for currently restricted treatments to levels commensurate with £30k per QALY?
- Is there evidence across a sufficient range of interventions to make such an assessment?

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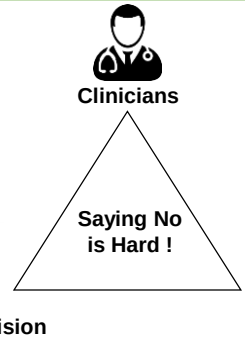
Poll: 8. Do you believe there are interventions/treatments that are restricted (including waiting lists) at cost/QALYs below those used for approving pharmaceuticals in your country?

There is an aversion to denying treatment from multiple stakeholders

WTP = HOC + ATDT + ATWT

Sir Andrew Dillon highlighted the challenges HTA bodies face

"Unless you believe that drug companies would be prepared to lower their prices in an unprecedented way, reducing the threshold to £13,000 per QALY would mean the NHS closing the door on most new treatments." Sir Andrew Dillon, February 2015



- **WTP** – Willingness to pay
- **HOC** – health opportunity cost
- **ATDT**– Aversion to Denying Treatment
- **ATWT** – Aversion to Withdrawing Treatment

Gary Becker highlighted the aversion to denying treatments

"If we are better off not providing care in the absence of a technology than denying care in its presence…there may be negative, as opposed to positive external effects of technological change." Gary Becker, August 2005

Are new treatments different from other technologies?

Unique Formulation

Once and done

Precision Medicine

Targeted Therapeutics

Gene Therapy

Novel Mode of Action

Next Generation Products

Disease Modifying Drugs

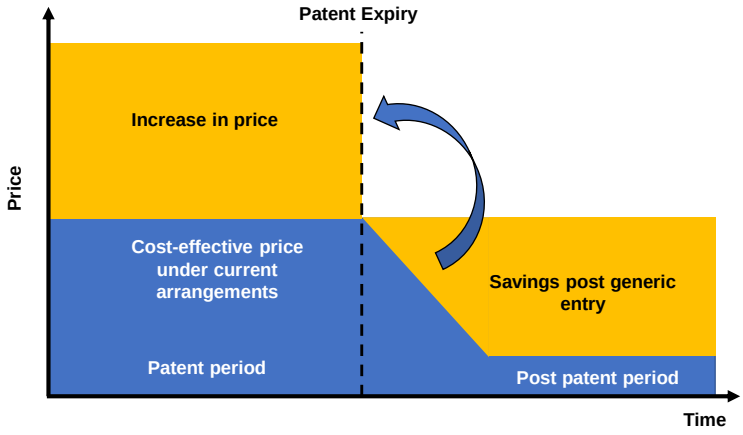
Patient Convenience

Innovative Delivery System

But what about health benefit?

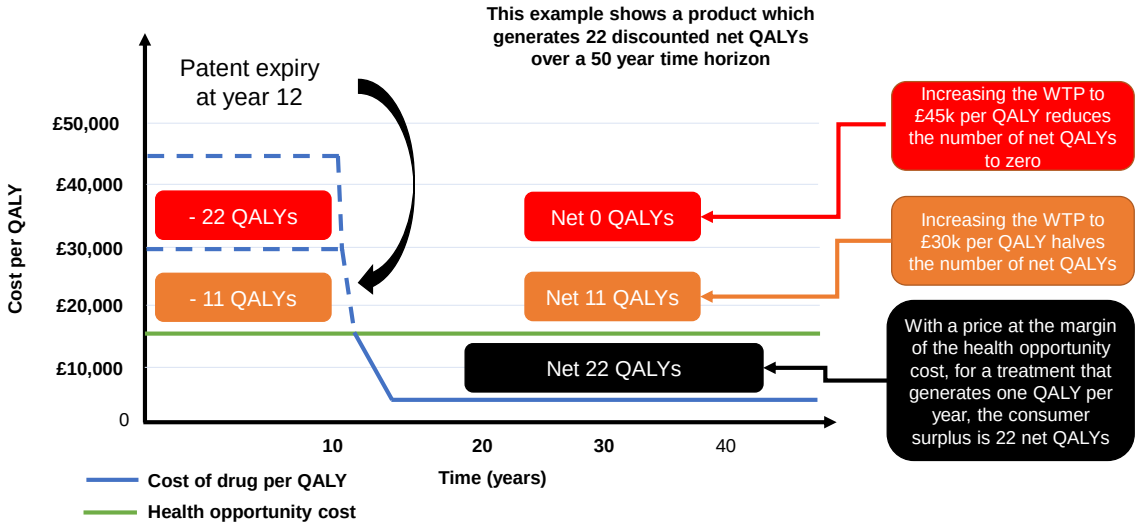
Research question - how much health would patients forgo for any of these attributes?

Allowing post patent savings to be considered in HTA is equivalent to granting an infinite patent



- With patents comes an implicit contract - that they have a finite length and that there is net welfare generation.
- Underlying principle is that society would miss out on net welfare generating goods in the absence of patents.
- No point in having patents if there is no additional net welfare gain.
- In economics, this is called consumer surplus – i.e. consumers ultimately have access to goods at a price below their maximum willingness to pay, if not there is no net welfare gain.
- In the context of health, this is the **lifetime additional population health.**

The number of net QALYs (consumer surplus) generated falls as the in patent price increases



There is a 'pull effect' which drives the incentive for innovation: A stylised example

Cost Per QALY	Net QALYs Per Product	No. Of Products Required
£15,000	21.68	50
£20,000	18.05	60
£25,000	14.41	75
£30,000	**10.78**	**100**
£35,000	7.14	151
£40,000	3.50	308
£45,000	0.13	n/a
Total Lifetime QALYs Generated for 100 products @ £30,000/QALY		**1,078**

At £15,000 per QALY, we could generate the same total number of net QALYs by funding only 50 products

At £25,000 per QALY, we could generate the same number of net QALYs in total by funding only 75 products

We are currently funding **100 in-patent products at £30,000 per QALY** – the current basic threshold that NICE uses. At £30,000 per QALY, each drug funded generates a net QALY gain of 10.78 QALYs - with 100 products funded, this gives 1,078 QALYs

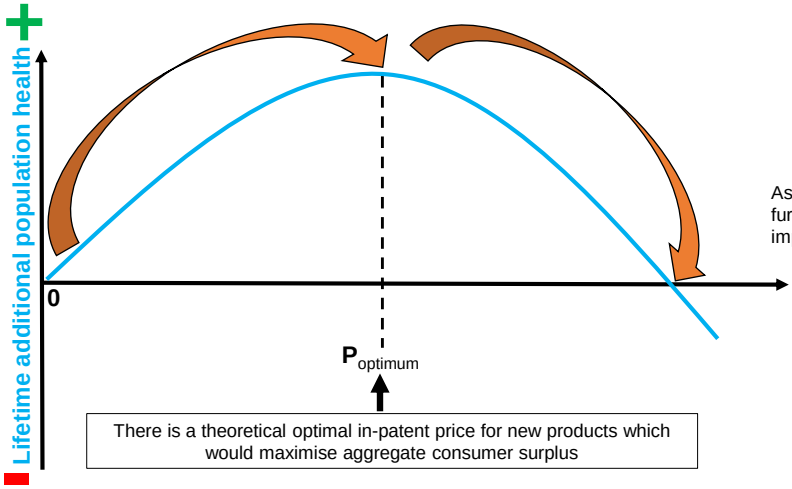
At £35,000 per QALY, we would require 51 additional products to be funded to achieve the same number of total QALYs

At £45,000 per QALY, there is no consumer surplus possible

At what level should the in-patent price be set at to maximise aggregate consumer surplus?

As in-patent price initially increases, there is a positive impact on consumer surplus as products are pulled through

When in-patent **price is close to 0**, industry has **no incentive to develop** new products. Therefore, no consumer surplus can be generated



As in-patent price increases further, there is a negative impact on the consumer surplus

There is a theoretical optimal in-patent price for new products which would maximise aggregate consumer surplus

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Poll: 9. Where on the curve do you think we are?

Conclusion: Health Opportunity Cost is a vital consideration for HTA and society

- Health opportunity cost is the health foregone from displaced funding
- As companies will aim to price at the WTP (cost per QALY threshold) margin – it highlights the requirement to consider the opportunity cost
- Non-pharmacological therapies and public health initiatives may be under utilised due to eagerness to fund novel pharmaceuticals
- Aversion to denying treatments and inappropriate valuation of product attributes can be detrimental to consumer surplus
- Allowing post patent savings to be considered in HTA is equivalent to granting an infinite patent
- There is a theoretical optimal in-patent price for new products which would maximise aggregate consumer surplus