Evidence based assessment of the value of innovation: pricing solutions and prospects

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How much can we pay for innovation?

<table>
<thead>
<tr>
<th>Price</th>
<th>Cost</th>
<th>QALYs gained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price &gt; P*</td>
<td>£60,000</td>
<td></td>
</tr>
<tr>
<td>Price = P*</td>
<td>£40,000</td>
<td></td>
</tr>
<tr>
<td>Price &lt; P*</td>
<td>£20,000</td>
<td></td>
</tr>
</tbody>
</table>

Threshold Cost-effectiveness
£20,000 per QALY
Recent UK estimates

- Scale of health opportunity costs
- Type of health effects (mortality, survival and morbidity)
- Where these are likely to occur (disease, age, gender)
- Severity of disease (burden, absolute and proportional)
- Net production effects (marketed and non-marketed)
- Impact on health inequality
- Affordability and the scale of budget impact
- Re-estimating for subsequent waves of data


Re-estimated for all waves of data

https://www.york.ac.uk/che/research/teehta/health-opportunity-costs/re-estimating-health-opportunity-costs/#tab-2
Are we paying too little for innovation?

- For every £10m of additional NHS costs

<table>
<thead>
<tr>
<th>Cost-effectiveness of a new drug</th>
<th>Health gained (QALYs)</th>
<th>Health lost (QALYs)</th>
<th>Net harm to NHS patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>£20,000 per QALY</td>
<td>500</td>
<td>773</td>
<td>-273</td>
</tr>
<tr>
<td>£30,000 per QALY</td>
<td>333</td>
<td>773</td>
<td>-440</td>
</tr>
<tr>
<td>£40,000 per QALY</td>
<td>250</td>
<td>773</td>
<td>-523</td>
</tr>
<tr>
<td>£50,000 per QALY</td>
<td>200</td>
<td>773</td>
<td>-573</td>
</tr>
</tbody>
</table>


Can we fix it? .......

* Claxton K. Pharmaceutical pricing: early access, the cancer drugs fund and the role of NICE. Centre for Health Economics, University of York. 2016 Mar, CHE Policy & Research Briefing.
Essentials

- Evidence based assessment of additional effects and costs
- Assessment of eligible population (max volume)
- Evidence based assessment of health opportunity costs
- Recalculate rebates when patent of any comparator expires
- Rebate to increases to price paid if exceed max volumes
- Reimburse prescribers (at price paid)
- Different rebates for different indications and subgroups

Why allow indication based pricing?

\[ P^* = \text{value on average for } Q^* \]

Value of the innovation = \( P^* \cdot Q^* \)
All value is appropriated by manufacturer during patent
Value of the innovation = $P^* \cdot Q^*$

Net harm done at global price

$P^* = \text{value on average for } Q^*$
Why allow indication based pricing?

What about other health care systems?

- Other high income countries
  - Norway, Australia, Spain, Netherlands, Canada, France, US
- Low and middle income
  - Indonesia, South Africa, India ...
- Mortality effect of health expenditure cross country data
  - Population (age and gender), mortality rates (age and gender), conditional life expectancies (age and gender), total health care expenditure
  - Country specific cost per life year and costs per DALY
  - Directly re-estimate for direct effects on YLL, YLD and DALY
**International price discrimination**

- Pay the monopoly price but no more during patent
  - Respects patents and intellectual property rights
  - Rebates benchmarked to generic entry
  - Encourage generic entry or reference price generics
- Price discrimination between and within HCS
  - NHS and manufacturers better off even at £13,000 per QALY
  - Encourage evidence about heterogeneity
- Enabling access really does matter
  - Danger of private top up insurance market
  - Abandon respect for patents
- Global benefits
  - Maximum global revenue for manufacturers
  - LMICs enter the market signal demand
  - Respect intellectual property rights
  - Best use of donated funds

**Are we giving away ‘too much’?**

- Pay the monopoly price but no more during patent
  - Respects patents and intellectual property rights
  - Rebates benchmarked to generic entry
  - Encourage generic entry or reference price generics
- Price discrimination between and within HCS
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  - Danger of private top up insurance market
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- Global benefits
  - Maximum global revenue for manufacturers
  - LMICs enter the market signal demand
  - Respect intellectual property rights
  - Best use of donated funds
Is this ‘enough’?

- Everyone pays their fare share
  - Maximum can afford to pay for the benefits during patent
- Share is/should be with current patent protections
  - How do shares differ by types of product
- Is current protection and shares sufficient?
  - Public health not a welfare objective
  - Theoretical and empirical work
- Are the better way to encourage innovation
- What are the other dynamic benefits
  - Compared to other sectors, including public
- How are they distributed

Implications and prospects?

- UK policy (renegotiation of PPRS)
  - DH, NHSE, NICE, ABPI, other manufacturers
- Other high income countries
  - Australia, Spain, Norway Netherlands, Canada, France,…US
- Low and middle income
  - Malawi, Indonesia, Thailand, South Africa, India …
- Global bodies
  - Development decisions (Gates Foundation)
  - Recommendations (World Health Organisation)
  - Purchasing decisions and differential pricing (Global Fund)
- Contribute to accountability of current arrangements
  - International, national and local
  - In low, middle and high income countries