What Evidence Should be Used to Quantify Cost-Effectiveness Thresholds for Decision Making in the Asia-Pacific Region?

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Terminology

What measure of benefit?
• Health outcome
• Additional factors (e.g. productivity)
• Weighting health differently for different recipients
• Example: NICE end of life criteria

What should the system pay?
• For a given measure of benefit
• E.g. QALY, equity-weighted QALY
What should a system pay?

- Evidence on the benefits the system could have generated
- How a system translates a change in financial resource into benefits
- Benchmark for value
  - Why accept a new technology when the system can generate more benefit using the resources elsewhere?

Terminology
- Supply side threshold
- Marginal productivity
- Opportunity cost

Evidential rather than a value judgement

How much should a health system pay?

<table>
<thead>
<tr>
<th>Health system funding</th>
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<tbody>
<tr>
<td>Funded intervention 1</td>
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<td>Funded intervention 2</td>
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<td>Funded intervention 3</td>
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<td>Funded intervention 4</td>
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<td>Funded intervention 5</td>
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<td>Funded intervention n</td>
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<th>Displaced intervention 2</th>
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<tr>
<td>Gains in survival</td>
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Opportunity cost
- Estimate of the benefits forgone per $1m reduced expenditure
How much should a health system pay?

Health system funding

Funded intervention 1
Gains in survival Gains in QoL

Funded intervention 2
Gains in survival Gains in QoL

Funded intervention 3
Gains in survival Gains in QoL

Funded intervention 4
Gains in survival Gains in QoL

Funded intervention 5
Gains in survival Gains in QoL

Funded intervention n
Gains in survival Gains in QoL

Unfunded intervention 1
Gains in survival Gains in QoL

Unfunded intervention 2
Gains in survival Gains in QoL

Unfunded intervention 3
Gains in survival Gains in QoL

New pharmaceutical
Gains in survival Gains in QoL

Opportunity cost
• Estimate of the benefits forgone per $1m increased expenditure

Estimation

\[ % \text{ change in health given a percentage change in expenditure} \]
Challenges for estimation

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Possible response</th>
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<tbody>
<tr>
<td>Individual-level data not available</td>
<td>Variation between distinct parts of the system</td>
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<tr>
<td>Time series not available</td>
<td>Cross-sectional alone; onus on adjusting for observed heterogeneity</td>
</tr>
<tr>
<td>Endogeneity</td>
<td>Use of instrumental variables</td>
</tr>
<tr>
<td>Health only partially measured</td>
<td>Need to extrapolation and generalisation</td>
</tr>
<tr>
<td>No relevant data in jurisdiction</td>
<td>Rely on variation on health/spend internationally</td>
</tr>
</tbody>
</table>

Empirical basis for health opportunity costs

- Estimate of marginal productivity of English NHS
- Based on linking expenditure to mortality
  - Variation between local commissioners
  - Across clinical areas
- Extrapolation to QALYs
- Central estimate £12,936
  - 2008 expenditure
  - 2008-10 mortality
- Updated 2017-18
  - Further waves of data
  - Time series
  - Testing assumptions with experts

International variation

Estimates: middle-income countries

Oshalek et al. CHE Research Report 122, 2015
www.york.ac.uk/che
Conclusions

- Estimates of health opportunity costs provide a key input into resource allocation decisions
- Why fund a new technology that delivers less benefit that can be achieved elsewhere?
- Empirical rather than value judgement
- Major international research initiative to provide estimates by jurisdiction
Thank you!

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https://www.york.ac.uk/che/

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