Too Costly to Keep Alive? Equity Concerns Arising From New Economic Evaluation Guidance

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THETA was commissioned by CHP Pharma to conduct an economic evaluation for Sevelamer which is used as a case study in this presentation today.
Background to ‘unrelated’ costs.

Using a case study to demonstrate the implications.

Potential solutions.
BACKGROUND
Costs that are not dependent on the intervention or disease being evaluated.

- Cost of the drug
- Cost of managing side effects associated with drug
- Cost of heart failure management
- Cost of potential cancer care due to increased life expectancy
# What Has Been the Debate?

<table>
<thead>
<tr>
<th>Include unrelated costs</th>
<th>Exclude unrelated costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ They represent an opportunity cost.</td>
<td>➢ Disadvantages high cost users.</td>
</tr>
<tr>
<td>➢ We include the health benefits derived from unrelated costs.</td>
<td>➢ May lead to an inequitable distribution of health.</td>
</tr>
<tr>
<td>➢ Creates more consistency as the definition is rather loose.</td>
<td>➢ Involves making assumptions about future healthcare spending.</td>
</tr>
</tbody>
</table>
New US guidance says:

- “…include current and future costs both related and unrelated to the condition under consideration…”

Guidelines from the Netherlands and Sweden also explicitly call for the inclusion of unrelated costs.

The National Institute for Health and Care Excellence in the UK says:

- “Costs that are considered to be unrelated to the condition or intervention of interest should be excluded”
In the previous 3rd edition of guidelines for economic evaluation CADTH said:

- “Unrelated costs that are incurred during life-years gained from the intervention may be included at the analyst’s discretion in a sensitivity analysis.”

Unlike previous editions now CADTH does not explicitly mention ‘unrelated’ costs.

In the latest 4th edition CADTH says:

- “…future resource use should be included where it is understood that the clinical or care pathway includes resource-intensive health states…”
CASE STUDY
Patients with end stage renal disease on dialysis often experience elevated phosphate levels.

Calcium based phosphate binders (CB) have been used to tackle this, however these may lead to calcification of arteries and increase the risk of cardiovascular events.

Non-calcium phosphate binders (Sevelamer) are as effective as CB in controlling phosphate levels, with a lower mortality risk. Relative risk of mortality 0.54 [CI]: 0.32 to 0.93. (Patel et al 2016)
HOW THE ECONOMIC EVALUATION WAS APPROACHED

Cost (annual): $122,260
Utility: 0.64

Cost (annual): $26,390
Utility: 0.816

CB cost: $72
Sevelamer cost: $4,380

Dialysis state
Related: $73,356
Unrelated: $48,904

Transplant state
Cost (annual): $26,390
Utility: 0.816

Annual drug cost (only incurred for dialysis)
CB cost: $72
Sevelamer cost: $4,380
## Case Study Results

### Base case

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Cost</th>
<th>δ costs</th>
<th>QALYs</th>
<th>δ QALYs</th>
<th>ICER</th>
<th>Prob. (CE)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
<td>$576,401</td>
<td>-</td>
<td>4.6</td>
<td>-</td>
<td>-</td>
<td>&lt;99%</td>
</tr>
<tr>
<td>Sevelamer</td>
<td>$835,475</td>
<td>$259,073</td>
<td>6.6</td>
<td>1.9</td>
<td>$139,204</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

### Set the cost of Sevelamer to $0

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Cost</th>
<th>δ costs</th>
<th>QALYs</th>
<th>δ QALYs</th>
<th>ICER</th>
<th>Prob. (CE)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
<td>$576,402</td>
<td>-</td>
<td>4.6</td>
<td>-</td>
<td>-</td>
<td>&lt;99%</td>
</tr>
<tr>
<td>Sevelamer</td>
<td>$808,340</td>
<td>$231,939</td>
<td>6.6</td>
<td>1.9</td>
<td>$121,709</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

### Remove unrelated dialysis costs

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Cost</th>
<th>δ costs</th>
<th>QALYs</th>
<th>δ QALYs</th>
<th>ICER</th>
<th>Prob. (CE)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
<td>$379,618</td>
<td>-</td>
<td>4.6</td>
<td>-</td>
<td>-</td>
<td>35%</td>
</tr>
<tr>
<td>Sevelamer</td>
<td>$548,164</td>
<td>$168,546</td>
<td>6.6</td>
<td>1.9</td>
<td>$95,981</td>
<td>65%</td>
</tr>
</tbody>
</table>

* $100,000 per QALY threshold
Using conventional threshold estimates, Sevelamer would not be deemed a cost effective intervention.

No life extending intervention would be deemed ‘cost-effective’ (at a $100,000 per QALY threshold) in this group of patients.

The merit of the treatment is washed out by pre-existing costs.
POTENTIAL SOLUTIONS
WHAT IS THE ROLE OF HEALTH ECONOMICS?

1. Tool for allocating a healthcare budget.
2. Maximization of health (or welfare).

In both cases- inclusion of unrelated costs is implied by economic theory (e.g. Meltzer 1997).
Are there certain subgroups with higher unrelated costs?

- Age (old vs young)
- Socioeconomic status (low vs high)
- General health (sick vs healthy)

Life extending interventions in individuals with higher unrelated costs become less cost effective (sometimes prohibitively so).
1. Accept inclusion and implications of “unrelated” costs.

2. Exclude ‘unrelated’ costs.

Both can be justified on equity grounds ...
3. Use equity weights in CEA

- Cost-effectiveness
- Equity

Win-Lose
- Cost-effective (+)
- Harms Equity (-)

Win-Win
- Cost-effective (+)
- Improves Equity (+)

Lose-Lose
- Cost-ineffective (-)
- Harms Equity (-)

Lose-Win
- Cost-ineffective (-)
- Improves Equity (+)

How much healthcare are we willing to trade-off to improve equity?

Cookson et al (2017)
Inclusion of unrelated costs is theoretically sound and more transparent.

However, results will raise issues around equity.

Must ensure these equity concerns are captured.

Explicit equity conversations need to take place in the decision making framework.
REFERENCES

THANK YOU

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