Identifying cost-effective methods of health
technology assessment for developers – the need for ‘fast and frugal’ evaluation.

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**Introduction** “Early” or Supply-side Health Technology Assessment (HTA) is potentially useful during technology development. Supply-side HTA aims to inform investment and study-design decisions made by developers and investors. Supply-side HTA analysis may help increase and make the net return on investment, and hence justify its own costs, in two ways: (1) by increasing the achievable price, market share or reducing development costs; and (2) by reducing development costs, possibly by facilitating earlier termination of development, for products that are ultimately unsuccessful. Given the large number of candidate products, high rates of failure, and fast pace of development, ‘fast and frugal’ methods are required for supply-side HTA to be cost-effective. This study aims to identify such ‘fast and frugal’ methods. We present the results from a wide-ranging literature review identifying approaches and methods used in supply-side HTA and propose a ‘fast and frugal’ framework for supply-side HTA.

**Why ‘supply-side’ HTA?**

Table 1 summarises the important distinctions between supply-side and more familiar ‘demand-side’ HTA. The key difference is that supply-side HTA is concerned with the perspective of a developer, rather than the insurance company or national health service who will be paying for the technology. Important implications of the supply-side perspective for methods of HTA are:

- as evidence is limited, methods of expert elicitation may be required
- as technologies are still in development HTA can inform product and study design decisions
- Analyses of value need to take account of a large number of ‘value’ implications which may not be fully defined and use re-imbursement across multiple jurisdictions need to be considered

**Table 1: Supply-side and demand-side HTA**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Supply-side HTA</th>
<th>Demand-side HTA</th>
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<tbody>
<tr>
<td>Evidence used</td>
<td>Limited, expert elicitation</td>
<td>Extensive, rigorous evidence-based approach</td>
</tr>
<tr>
<td>Decision-making</td>
<td>Product development</td>
<td>Patient care planning</td>
</tr>
<tr>
<td>Methodology</td>
<td>Qualitative</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Time horizon</td>
<td>Short, fast</td>
<td>Long, slow</td>
</tr>
<tr>
<td>Resource use</td>
<td>Limited</td>
<td>Excessive</td>
</tr>
<tr>
<td>Reimbursement</td>
<td>Primary stakeholders</td>
<td>Patients and payers</td>
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</tbody>
</table>

**Results:**

- 81 articles were found examining methods of supply-side HTA.
- Cost-effectiveness analysis was by the most frequent method applied, within this category many varied were found including Markov models, simulation models and Bayesian approaches.
- Expert elicitation and user feedback methods were also well represented.
- Other methods included value of information analysis, non-parametric analysis and real option analysis.
- Few examples of qualitative methods were found.

**Case studies in supply-side HTA**

Case study 1 [4] is an example of a study where steps 1-3 of the framework for supply-side HTA would probably have been sufficient to decide that a new biomarker in this area was unlikely to deliver value. In contrast case study 2 [5] illustrates a case where it is important to model the options in some detail. Key factors in case study 1 are that existing risk prediction is good, treatment is cheap and the side effects of treatment are low. Conversely, in case study 2 existing methods of diagnosis have low accuracy rates and the consequences of misdiagnosis are relatively severe. In this case steps 1-3 are not adequate to suggest whether or not to continue investment in the technology development and a quantitative approach is appropriate.

**Fast and frugal methods of supply-side HTA**

The literature includes few examples of explicit fast and frugal methods. Even the ‘headroom method’ (which is a form of cost-effectiveness model with the addition of estimates of prevalence and costs of development) has only been applied in a ‘fast and frugal’ way in two studies [4,6]. However, there are in ways in which the approach shown in Figure 2 can be adapted to be fast and frugal. A non-comprehensive list of such adaptations is shown in Table 2.

**Case studies in supply-side HTA (continued)**

**Case studies**

**Case study 1**

**Case study 2**

**Conclusions**

A range of methods used for supply-side HTA were identified. These included quantitative cost-effectiveness models of varying complexity. The process of conceptually isolating the decision problems and causal value pathways were, in general, not made explicit. In many cases these steps alone could be highly informative. Our review to date has found a lack of ‘fast and frugal’ methods. This category of methods warrants further development as many developers with limited resources would benefit from a fast and frugal approach.

**References**