Economic Analysis

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Tús Áite do Shábháilteacht 1 Othar
Patient Safety 1 First
Health Information and Quality Authority: Functions

- Setting Standards and supporting improvement
- Monitoring Quality and Safety in Healthcare
- Inspecting Social Services
- Health Information
- Health Technology Assessment
- Research ethics

Driving safer better care
Health Information & Quality Authority

- Established under Health Act 2007
- Independent Body, reporting directly to the Minister for Health
Objective:

To inform safe and effective health policies that are patient focussed and achieve best value

HTA is a “decision support tool”
Health Technologies

Includes a wide range of interventions used in healthcare and health promotion

- Pharmaceuticals (Drugs)
- Vaccines
- Medical Devices
- Diagnostics
- Medical and surgical procedures
- Public health activities

Includes the systems within which health is protected and maintained
Why do we need HTA?

• Introduce technologies speedily with proven significant health benefits
• Prevent the introduction of technologies which fail to meet the requirements of evidence-based analysis, an
• Continuously monitor the effectiveness of technologies after their introduction.
“HTA is a decision support tool”

Multidisciplinary process, summarises information about

- **Safety**
- **Clinical and cost-effectiveness**
- **Budget impact**
- **Organisational impact / resource implications**
- **Social and ethical issues**

related to use of a health technology in a systematic, transparent, unbiased and robust manner
“rationing”

One in, one out?
HTA for Clinicians……

..a clinical purist?  ..or a financial realist?
Economic Evaluation

Cost effectiveness analysis:
A form of economic evaluation which simultaneously assesses the costs and consequences (benefits) of an intervention.

Compare the costs and consequences (effects) of technology A vs technology B.

HIQA: compare the costs per life year gained (LYG) or quality-adjusted life years gained (QALYs)
Questions addressed in an economic evaluation:

1. Can it work (efficacy)?
2. Does it work (effectiveness)?
3. Is it worth doing (efficiency)?
4. How much will it cost (affordability)?
Outcome measure

**Life years gained:**
Number of years a patient’s/individual’s life is prolonged as a result of a particular intervention.

**Quality-adjusted life years (QALY):**
Number of years a patient’s/individual’s life is prolonged as a result of a particular intervention, incorporating adjustments for the quality of that life (morbidity)

- Universally applicable to all patients and diseases
- Allow comparisons between different health programmes
- Useful for decision makers
- QALYs allow for measurement of values or preferences for a particular health state
Cost-effectiveness analysis

- Compares costs and consequences of two technologies A and B

- Incremental cost-effectiveness ratio (ICER)
Economic evaluations are usually in the form of CEA or CUA.

<table>
<thead>
<tr>
<th>Evaluation Type</th>
<th>Costs</th>
<th>Benefits</th>
</tr>
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<tbody>
<tr>
<td><strong>Cost effectiveness</strong></td>
<td>€</td>
<td>Natural units</td>
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<tr>
<td>(CEA)</td>
<td></td>
<td>(e.g. life years gained, ↓HbA\textsubscript{1}C)</td>
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<tr>
<td><strong>Cost utility</strong></td>
<td>€</td>
<td>Health status</td>
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<tr>
<td>(CUA)</td>
<td></td>
<td>(e.g. QALYs or DALYs gained)</td>
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<tr>
<td><strong>Cost benefit</strong></td>
<td>€</td>
<td>€</td>
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<tr>
<td>(CBA)</td>
<td></td>
<td>(e.g. based on willingness-to-pay)</td>
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<tr>
<td><strong>Cost minimisation</strong></td>
<td>€</td>
<td>Assume to be equivalent</td>
</tr>
<tr>
<td>(CMA)</td>
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Cost-effectiveness plane

- **Q1**: Intervention more effective and more costly
- **Q2**: Intervention more effective and less costly
- **Q3**: Intervention less effective and less costly
- **Q4**: Intervention less effective and more costly

**Effect (QALY)**
- **Reject**
- **Accept**
- **Probably Reject**
The incremental cost-effectiveness ratio is usually represented graphically as a line passing through the origin on the cost-effectiveness plane.
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The line passing through the origin represents our ‘acceptable’ cost-effectiveness ratio. That is our maximum (or threshold) willingness-to-pay for a unit of effect (life year or QALY).
Willingness to pay

Having derived the incremental cost-effectiveness ratio (ICER) we need to consider the issue of ‘willingness to pay’

“Here’s ten grand, Doc. I don’t expect any special treatment.”
Acceptability of a technology with an ICER value in the region of the threshold will be influenced by:

- Degree of uncertainty in calculating the ICER
- The innovative nature of the technology
- Particular features of the condition and population receiving the technology
- The wider societal costs and benefits
Criteria 3 Economic Impact

Would implementing this guideline have a substantial budget impact on the healthcare system?

Are there potential cost savings to be realised if the guideline is implemented?

Is there national or international cost-effectiveness evidence to support implementing the guideline?
Criteria 3 Economic Impact

Would implementing this guideline have a substantial budget impact on the healthcare system?

• Have the resource implications of implementing the guideline been considered?

• Have the resources required for any initial set up or roll out phase been considered?

• Have the cost of these resources to the publicly-funded system been estimated?
Budget impact

Would implementing this guideline have a substantial budget impact on the healthcare system?

- Comprehensive economic evaluation tends to be both time and labour intensive

- Budget impact analysis looks at the added financial impact of implementing a new clinical guideline over a finite period (this may be sufficient in most cases)

- Typically only the direct costs to the publicly-funded health and social care system (HSE) in Ireland are included

- Indirect costs (absenteeism from work, disability, need for long-term care etc.) are important in instances where significant budget implications for other publicly-funded services or transfer payments are anticipated.
Budget impact matters – even when a technology is deemed cost effective?

Government gives up cervical cancer vaccine plan

Harney cites ‘very scarce’ health resources
Budget impact

Assessing the budget impact can be broken into three distinct steps:

1. Identifying the resource use that may change
2. Estimating the size of these changes
3. Determining the relevant costs for these changes
1. Identifying the resource use that may change

It is important to determine the treatment or intervention pathway:

- How do the people receiving the intervention interact with the health services?
- Who carries out the intervention and where?
- How is onward treatment managed and monitored?
1. Identifying the resource use that may change

- Are there any initial one-off resource requirements? (capital investment, staff training)
- Will there be additional service utilisation arising from the intervention (Additional testing (e.g. biopsies), treatment, follow-up/monitoring, Primary/secondary/tertiary care)
- Technology (Equipment purchase, ICT upgrading, test kits, Laboratory usage)
- Harms/side-effects: will there be additional treatment of harms (medicines, surgical, alternative treatment pathway)
Assessing the budget impact can be broken into three distinct steps:

1. Identifying the resource use that may change

2. **Estimating the size of these changes**

3. Determining the relevant costs for these changes
2. Estimating the size of these changes

- When evaluating the economic impact, it is the incremental impact that should be considered, the total cost of implementing the national guideline less what would have been spent on the current standard of care.

- The comparator used should be ‘routine care,’ that is, the current or most widely used clinical practice in Ireland; in some cases this may be a mix of a number of different practices.

- Who will receive the intervention? How many patients/individuals?
2. Estimating the size of these changes

Who will receive the intervention?

The target population!

The target population characteristics

- age & sex
- socio-economic status
- life expectancy
- co-morbidities
- treatment response
- etc

will dictate how much of the intervention is required and will also impact on the treatment response.
2. Estimating the size of these changes

Data we might be interested in and potential sources:

- Morbidity (HIPE, PCRS, National Cancer Registry)
- Mortality (Vital Statistics, National Paediatric Mortality Register, National Drug-Related Deaths Index)
- Health service utilisation (HIPE, PCRS, BreastCheck & CervicalCheck, Emergency Department Activity data, Immunisation Uptake, National Psychiatric Inpatient Reporting System)
- Demographic (Census)
- Exposure (National Roads Authority, Radiological Protection Institute of Ireland, Office of Tobacco Control)
Assessing the budget impact can be broken into three distinct steps:

1. Identifying the resource use that may change
2. Estimating the size of these changes
3. Determining the relevant costs for these changes
3. Determining the relevant costs for these changes

- Technology/intervention- (Data from the manufacturer)
- Staff- include pay at mid-point of pay scale, employers’ PRSI, imputed pension cost, and overheads (DoH: Pay-scales for public sector staff)
- Hospital in-patient and daycase procedure costs (casemix)
- Drugs covered on the community schemes (PCRS)
- Hospital finance departments
3. Determining the relevant costs for these changes

- Annual depreciation of any capital costs should be included in the analysis.

- Retrospective health costs must be inflated to current prices using the Consumer Price Index for Health.

- Where costs are applied from other countries, all costs must be converted to euro using Purchasing Power Parity indices.

- If transferring costs from another currency, the inflation should be calculated using the Consumer Price Index for the local currency prior to conversion to euro using Purchasing Power Parity indices.
Criteria 3 Economic Impact

Are there potential cost savings to be realised if the guideline is implemented?

- Are there any potential cost savings due to changes in the use of resources?

- Have the benefits from improved outcomes been quantified and the associated costs or savings been estimated?
Are there potential cost savings to be realised if the guideline is implemented?

- Savings from treatment avoided due to improved health outcomes (e.g. fewer bed days), a reduction in adverse events or stopping or changing current practice (different material costs).
- Particularly relevant for preventive care – use of intervention may result in reduced health service use.
- Although introduction of a new guideline may lead to a reduction in staff requirements, it may be difficult to realise any potential savings (e.g., redeployment of staff).
Criteria 3 Economic Impact

Is there national or international cost-effectiveness evidence to support implementing the guideline?

• Is a summary of the cost-effectiveness evidence presented? Is this generalisable or relevant to the Irish healthcare setting?

• Has this evidence been gathered using systematic searching methods and are these methods documented?
Is there national or international cost-effectiveness evidence to support implementing the guideline?

- Systematic, transparent, unbiased and robust, evidence-based review is needed
- Similar to clinical effectiveness/guideline review
- Same methods for defining search question (PICOs) and reporting search strategy (inclusion/exclusion criteria, flow chart etc.)
Search for economic evidence

- Systematic literature search to identify cost effectiveness evidence should be reproducible, thorough and transparent, consistent with the search for clinical effectiveness/guidelines.

- Specialised databases (DARE, NHS EED, HTA Database)
  - www.crd.york.ac.uk/CRDWeb,

- Search should be performed using the major health search engines such as MEDLINE and EMBASE using economic search filters (available www.york.ac.uk/inst/crd/intertasc/econ.htm).
20 citations identified from electronic search
- Ovid (Medline, Embase) = 18
- DARE/ NHS EED/ HTA Database/ Cochrane Register of Controlled Trials/Cochrane Reviews) = 2

16 Citations excluded (reason)
- 1 (Editorial)
- 3 (Inappropriate patient cohort)
- 3 (Paediatric score)
- 6 (Outcomes Not Relevant)
- 3 (Review)

4 Citations Met Inclusion Criteria

2 studies contained no relevant data

Total number of Included studies = 2
Identifying relevant studies:

- How applicable is the study to the Irish context? Are the populations, interventions and healthcare system similar to the Irish setting?

- Is it current? Older studies may include outdated practices
Search for economic evidence

Appraising the evidence:

- Is the study of adequate quality?
- Are there major limitations in the study design or in the economic modelling?

Available tools in considering the quality of economic studies (CHEC-list, NICE guidelines Methodology checklist - economic evaluations and the health technology assessment checklist for decision-analytic models)
Search for economic evidence

Synthesising and summarising the results

• What are the possible inferences that may be drawn for the likely cost-effectiveness of the intervention in the Irish setting?

• Can any inconsistencies in the results be explained? (e.g. different settings, perspectives used, prevalence rates, input costs)

• Summarise limitations and applicability of the studies
Relevant criteria

10. Systematic methods have been used to search for evidence on effectiveness and cost-effectiveness to ensure that the clinical guideline is based on best available evidence. The full search strategy should be clearly outlined.

14. The health benefits, side effects, risks, cost-effectiveness, resource implications and health service delivery issues have been considered in formulating the recommendations.

23. The potential budget impact and resource implications (equipment, staff, training etc.) of applying the recommendations have been considered.
Guidelines for the Economic Evaluation of Health Technologies in Ireland
2010

Guidelines for the Budget Impact Analysis of Health Technologies in Ireland
2010

Guidelines for Evaluating the Clinical Effectiveness of Health Technologies in Ireland
2011

www.hqa.ie
Useful websites

Ireland

– HIQA HTAs/Guidelines: www.hiqa.ie
– National Centre for Pharmacoeconomics: www.ncpe.ie

International Collaborations and Organisations

– http://www.eunethta.eu/
– http://www.inahta.org/
– http://www.htai.org/
– www.euroscan.org.uk

Databases

– http://www.crd.york.ac.uk/crdweb/
– http://www.hta.ac.uk/
– http://www.inahta.org/HTA/Database/

HTA explained

Thank You