

Health economic evaluations in diagnostics

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Workshop Format

Why do we need health economic studies (HES)?

□What do HES evaluate?

Health economic evaluation in diagnostics



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Learning objectives

□Understand the purpose of **economic evaluation**

Importance of mapping a care pathway (conceptual modelling)

Required information to carry out an economic evaluation of a diagnostic test

□Value of **early economic modelling**

Why do decision makers need health economics?



Health economic evaluation

 Economic evaluation was developed to optimise decision making when choices have to be made between different courses of action It compares the costs and outcomes of alternative strategies for diagnosis and/or treatment



Why economic evaluation?

- Effectiveness information is necessary but **not sufficient** for decision making
- Need to explicitly consider costs and opportunity costs of different courses of action



- Economic evaluations offer a **framework** for:
 - Identifying, measuring and valuing resource use, costs and outcomes
 - Handling uncertainty

Types of economic evaluation: Cost-effectiveness analysis

- **Compares** costs with gains from adopting a technology.
- Are the **extra** costs worth the extra benefits?



	Value	
5		Health effect measurement unit
	Cost-utility analysis (CUA)	Quality adjusted life years (QALYS)
	Cost-consequences analysis (CCA)	Multiple outcomes reported in disaggregated manner
	Cost-benefit analysis (CBA)	Monetary value
	Cost-effectiveness analysis (CEA)	Natural units (e.g. life years, cases detected)
	Cost-minimization analysis (CMA)	None

Questions?



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Obtaining cost-effectiveness evidence

Potential Sources:

- Randomised controlled trials
 - Unbiased estimates
 - Patient specific data
 - Prospectively collected evidence (Outcomes & resource use)
- However, trials do have limitations:
 - Limited representativeness of patients
 - Unsuitable for population level interventions
 - Not comparing all possible alternatives
 - Time horizon of the study often not long enough to capture all effects



Time horizon



- Appropriate time period to capture the impact of an intervention
- Trials rarely provide evidence over the lifetime
- Models can be extended beyond the time horizon of a trial

Benefits:

- Explore downstream effects
- Account for complexities associated with the diagnostic test (e.g. adverse events)

...information from a range of sources might need to be combined



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Decision Analysis



Stages in development of model



Evidence to inform models



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Questions?







Early economic modelling

Provides a **framework** to build on as more evidence is gathered and uncertainties decrease and allows for an iterative approach to product and evidence development



Feedback from stakeholder engagement at all stages ensures a product fit for purpose and upfront assessment of barriers and facilitators to adoption

Use & benefits of early economic modelling

- Exploration of optimum role of the test and explore potential:
 - i. settings
 - *ii. populations/patient groups*
 - *iii. trigger points (indications) for testing*
 - *iv. diagnostic and full care pathways*
 - v. outcomes of interest
 - vi. Optimal frequency of testing and thresholds



- Early engagement with potential users (patients, clinicians) to develop
 - a 'fit for purpose' product & identify facilitators & barriers to adoption
 - What is the optimum role of the technology to ensure return on investment?
 - What is our adoption strategy?

Limitations

- Difficulty defining the setting in which the intervention can be used in **future** practice
- Limited and **low-quality** data due to weaker sources (e.g. expert opinion, unpublished results)
- Data used are usually different from **real-world practice**
- Limited time and monetary resources in product development stages

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Value of information (VOI) analysis

- In-depth early modelling
- Formally addresses the question "Is the time and expense of further research worthwhile?"
 - Is additional information needed to reduce uncertainties surrounding a decision?
 - What sort of additional information is most valuable?
 - How much more additional information is needed?

VOI gives the opportunity to assess the need and value of conducting additional research at current point in product and evidence development

Questions?



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NICE Landscape for economic evaluations of diagnostics

Notify a medical device, diagnostic or digital technology for evaluation to the NICE MTEP Medical Technologies Topic Oversight Group (MTTOG) chooses technologies with the highest potential benefit to patients and health care and routes these to the most appropriate NICE evaluation programme • Diagnostic Assessment Programme (DAP) evaluates technologies that have the potential to improve health outcomes but whose introduction is likely to be associated with an overall increase in cost to the NHS

Medical Technologies Evaluation Programme (MTEP)

evaluates Diagnostic technologies that may offer similar health outcomes at less cost, or improved health outcomes at the same cost as current NHS practice

Interpretation of a CEA



 \checkmark = new strategy is recommended

Increasing benefits

X = current strategy is recommended

= further judgement is required to determine benefit obtained from new strategy is worth extra cost

Interpretation of a CEA



Increasing benefits

 \checkmark = new strategy is recommended

X = current strategy is recommended

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Interpretation of a CEA



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NIHR Newcastle In Vitro Diagnostics Co-operative Increasing benefits

Conclusions

• Health economics and economic evaluation used to make resource allocation decisions in the healthcare service

 Health economic studies can be used to address different questions from different perspectives (i.e. healthcare service, developers) at different parts of the diagnostic test development

• Early economic models developed through stakeholder engagement can promote iterative approach to both evidence and product development to inform your market and adoption strategy



We are keen to hear how we can support your needs through our academic research. Please don't hesitate to contact us for advice or feedback.

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