Bringing Together Health Economics and Clinical Research
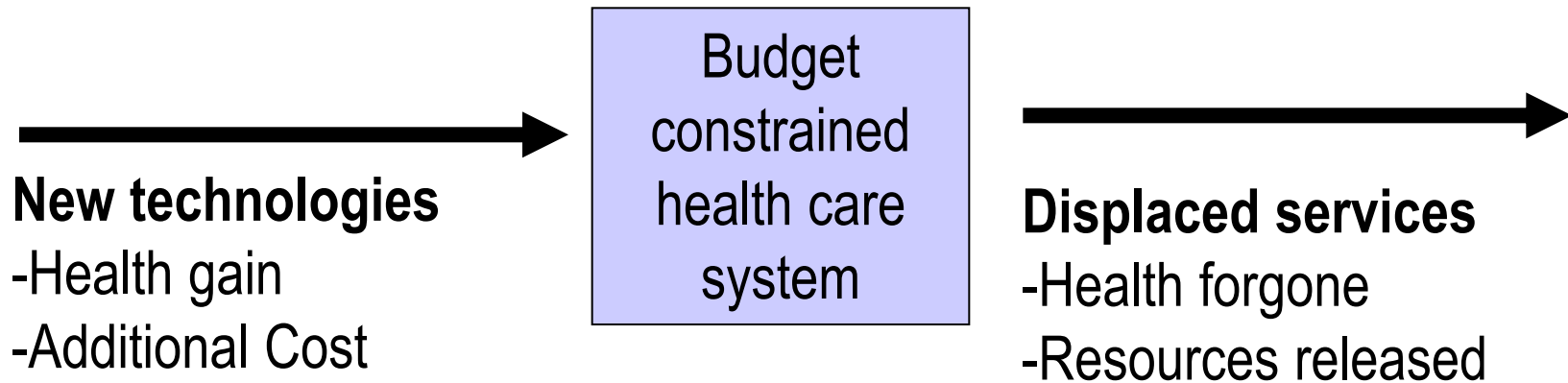
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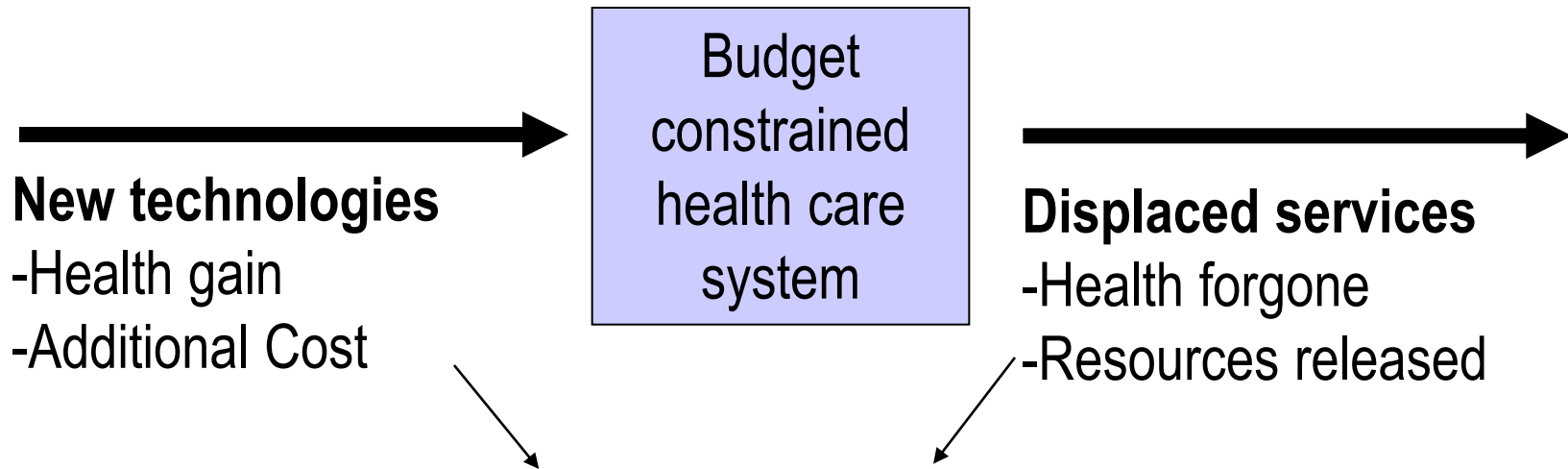*Economics of Cancer Workshop, 28th October 2011*

Background

- Long tradition of adding on economic evaluation late in clinical development on new technologies
  - Uncertain impact on resource allocation decisions
- International trend to use economics to establish value of new technologies (mainly pharmaceuticals)
  - Late in development process – after launch
  - Many cancer therapies seen as limited value at launch
- Little known regarding value of many non-pharmaceutical interventions
- Are limited resources (service and research) being used efficiently?

→ Need for economics to be built into R&D process early and more fully

Defining value

New technologies
-Health gain
-Additional Cost

Budget constrained health care system

Displaced services
-Health forgone
-Resources released

Is the health gain from the new technologies greater than the health foregone through displacement?

Defining value

New technologies → Budget constrained health care system → Displaced services

New technologies
-Health gain
-Additional Cost

Budget constrained health care system

Displaced services
-Health forgone
-Resources released

Cancer patients can be gainers and losers
- Diagnostic (e.g. MRI to stage cancer)
- Chronic disease (e.g. testicular)
- Screening (e.g. cervical)
- Primary prevention (e.g. prophylactic mastectomy)
- Secondary prevention (e.g. early breast cancer)
- Life extending (e.g. multiple myeloma)
- Palliative (e.g. dysphagia in oesophageal)
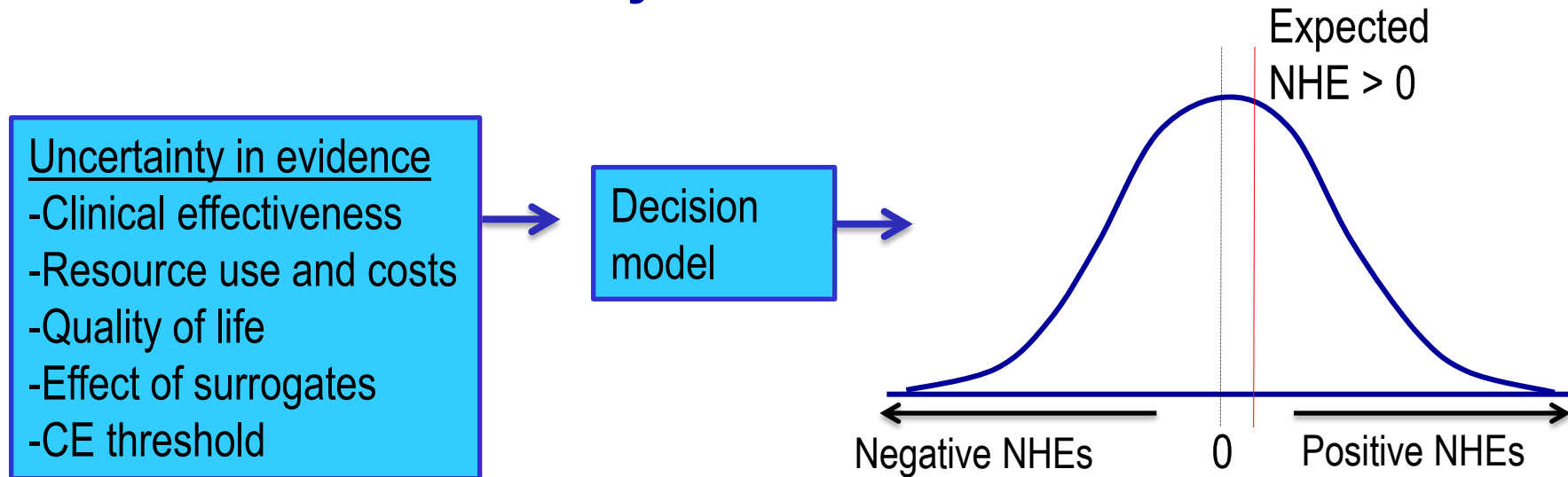- Care (e.g. late stage lung cancer)

Defining value: cost-effectiveness or net health effects
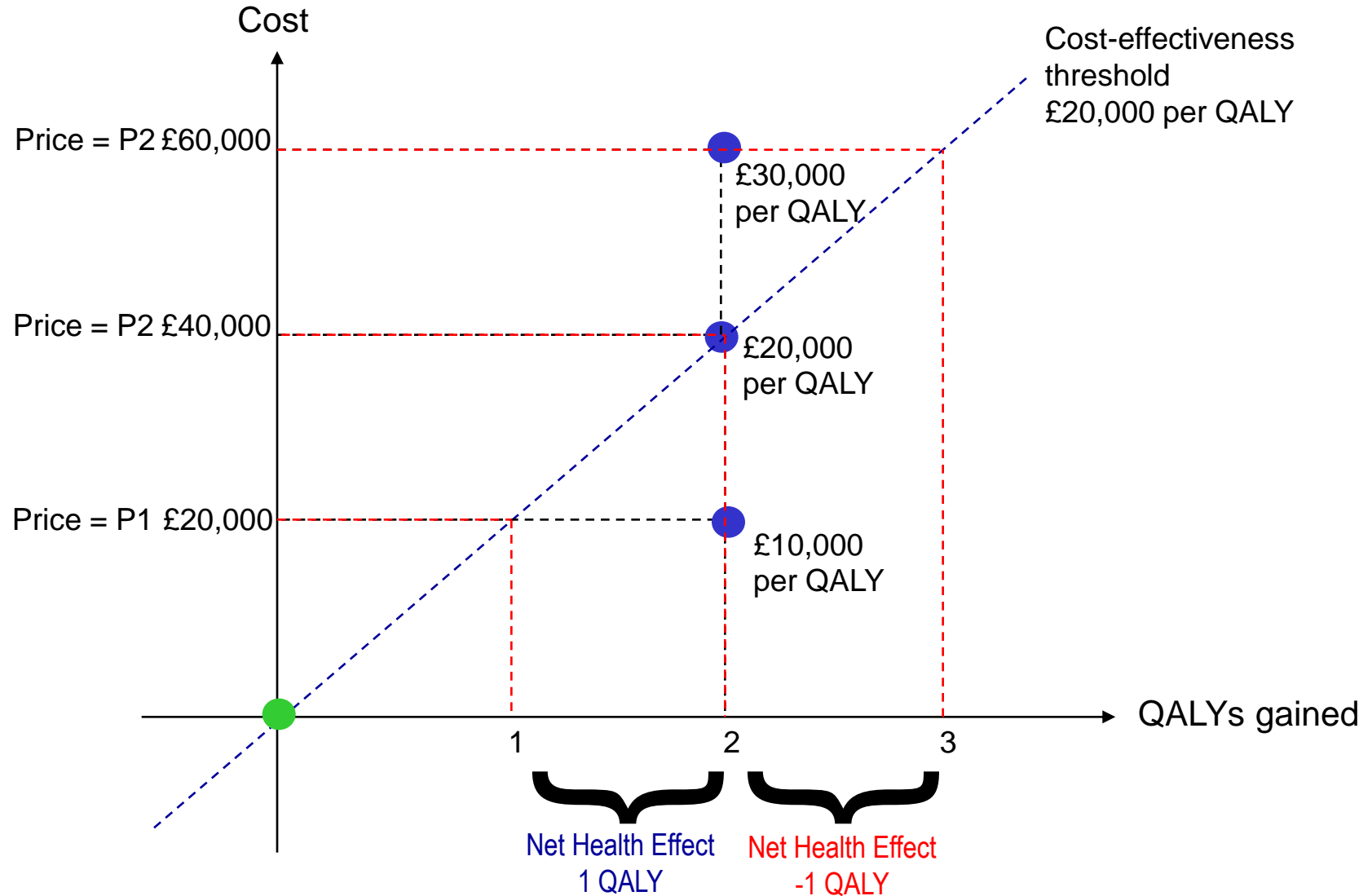
Questions about net health effects, cancer services and R&D in cancer

- Are all new cancer therapies providing net health effects?

- Is there enough evaluation of the full range of cancer services?

  – Prevention vs diagnosis vs therapy vs care?

- Are we evaluating existing cancer services for possible disinvestment?

The costs of uncertainty and the value of research

Uncertainty in evidence
-Clinical effectiveness
-Resource use and costs
-Quality of life
-Effect of surrogates
-CE threshold

Decision model

Expected NHE > 0

Negative NHEs   0   Positive NHEs

- Positive expected (average) NHE
- Decision to recommend/fund → risk of wrong decision
- Cost of uncertainty →reductions in population health
- Objective of research
  - Reduce decision uncertainty
  - Reduce cost of uncertainty
  - Increase population health
→ Prioritise potential research using same metrics as services

Quantifying the value of research

<u>Total potential value of research</u>
-How uncertain is the decision?
-What are the implications of a wrong decision for NHEs?
-What is the size of the population who can benefit?
-How long will the research be of value to decisions?

<u>Potential value of research on specific endpoints</u>
-Relative effectiveness (RCTs)
-Underlying risk of clinical events (observational)
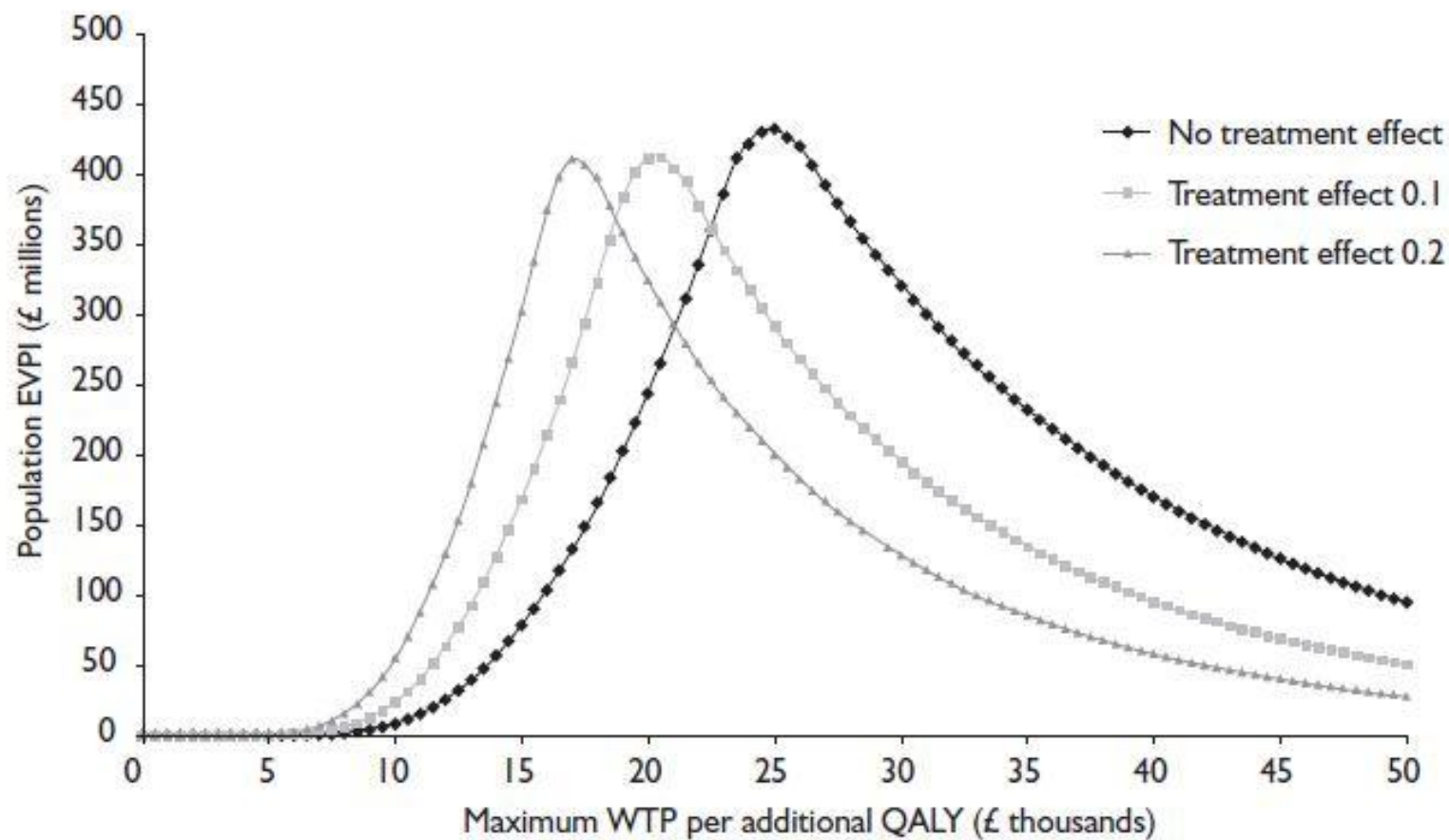-Quality of life and costs of clinical events (observational)
- etc...

<u>Value of particular research studies</u>
-Is the cost less than the <u>potential</u> value?
-Marginal cost and benefit of <u>specific</u> studies
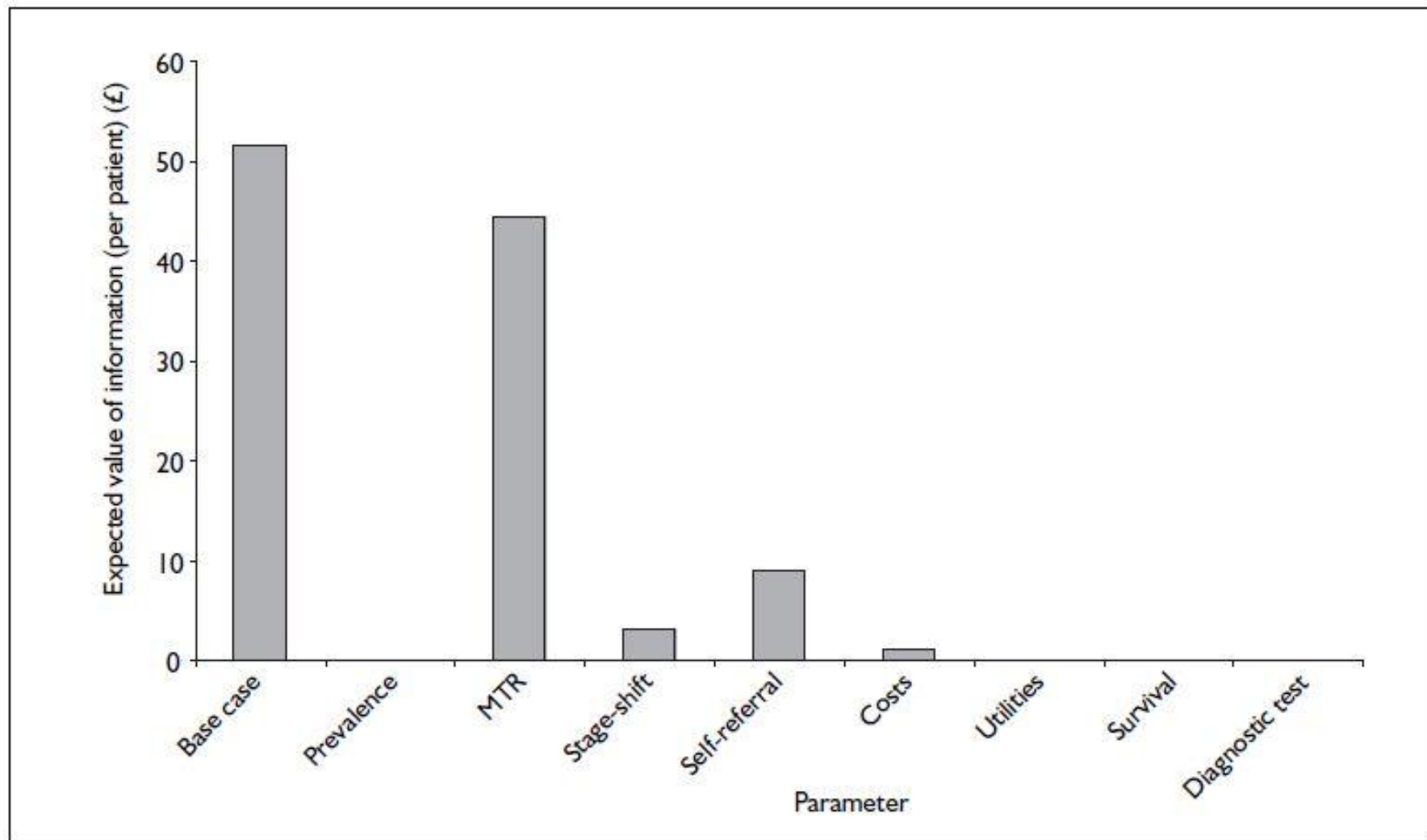   -Different sample sizes
   -Different sequence of studies

Example – oral cancer screening
Total potential value to population

Example – oral cancer screening
Priority endpoints

Speight *et al.* *Health Technology Assessment* 2006; Vol. 10: No. 14

Making assessments at launch of new technologies
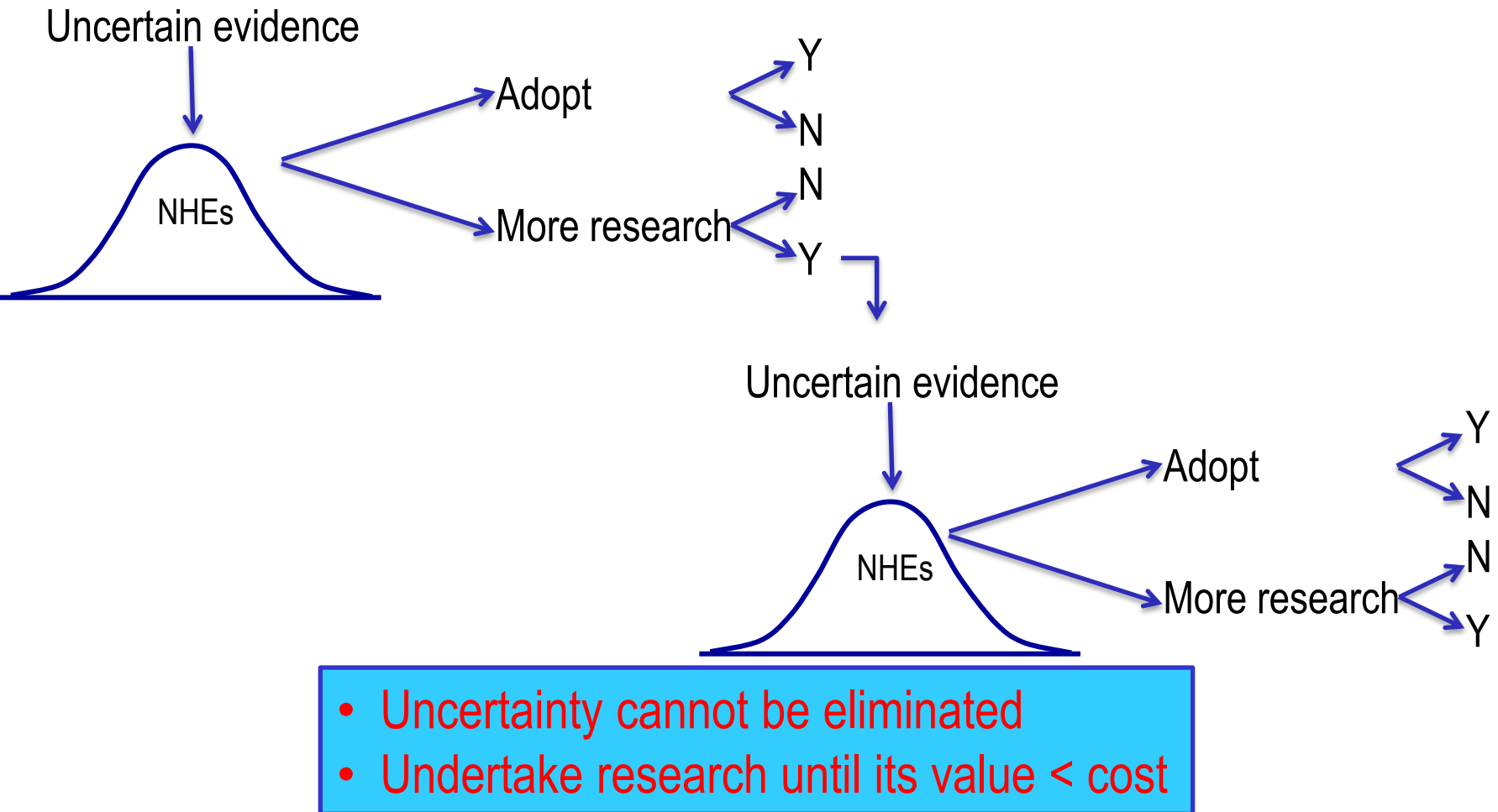
Positive expected NHEs based on evidence available at launch?

Is further research of potential value?

Possible decision	Considerations
Approval	• Valuable research unlikely to be undertaken • Lost research opportunities: potential population health loss
Approval with research	• Are irreversible costs incurred? • What are the chances of research being undertaken?
Only in research	• Creates incentives to undertake research • Health gain of current versus future patients
Reject	• Intervention not cost effective based on existing evidence and price

Claxton *et al. 2011. Uncertainty and Decisions: When Should Health Technologies be Approved Only in or with Research?. University of York; Centre for Health Economics Research Paper 69. York: CHE, University of York.*

Making assessments at earlier stage: iterative evaluation

- Uncertainty cannot be eliminated
- Undertake research until its value < cost

Fenwick *et al. 2000. Improving the efficiency and relevance of health technology assessment: The role of decision analytic modelling. Centre for Health Economics Discussion Paper 179. York: Centre for Health Economics, University of York.*

Implications for manufacturers

- Framework provides clear signals regarding evidence required at launch

- Problem of signals not being consistent internationally

- Can build into development process
  - Pick products most likely to be licensed and accepted by NHS

- At launch may be choice between reducing (effective) price and undertaking more research

Implications for publically-funded research

- Efficient research infrastructure can offer rapid opportunities for OIR/AWR

- May be instances where value of research to NHS > than value to commercial manufacturers
  - NHS do research?

- Provides framework for allocation of finite research resources
  - Same criterion as services – NHEs positive

- Can be used consistently across clinical areas

- Investment and disinvestment

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