The complexity of the allocation problem in health care: can current decision rules provide a useful guide?

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Questions of fact and questions of value?

- When costs displace health (Δc_h)

$$\underbrace{\Delta h}_{\text{Health gained}} \quad \underbrace{-\frac{\Delta c_h}{k}}_{\text{Health forgone}} \geq 0 \qquad v.\Delta h - \frac{v}{k}\Delta c_h \geq 0, \quad or \quad \frac{\Delta c_h}{\Delta h} \leq k$$

- When costs displace consumption (Δc_c)

$$\Delta h \quad \underbrace{-\frac{\Delta c_c}{v}}_{\text{Consumption forgone}} \geq 0 \qquad v.\Delta h - \Delta c_c \geq 0, \quad or \quad \frac{\Delta c_c}{\Delta h} \leq v$$

- Costs fall on both

$$\Delta h \quad -\frac{\Delta c_h}{k} \quad -\frac{\Delta c_c}{v} \geq 0 \qquad v.\Delta h - \frac{v}{k}\Delta c_h - \Delta c_c \geq 0, \quad or \quad \frac{\Delta c_h - \frac{k}{v}\Delta c_c}{\Delta h} \leq k$$

Fact : k = how much health displaced by increased HCS costs?

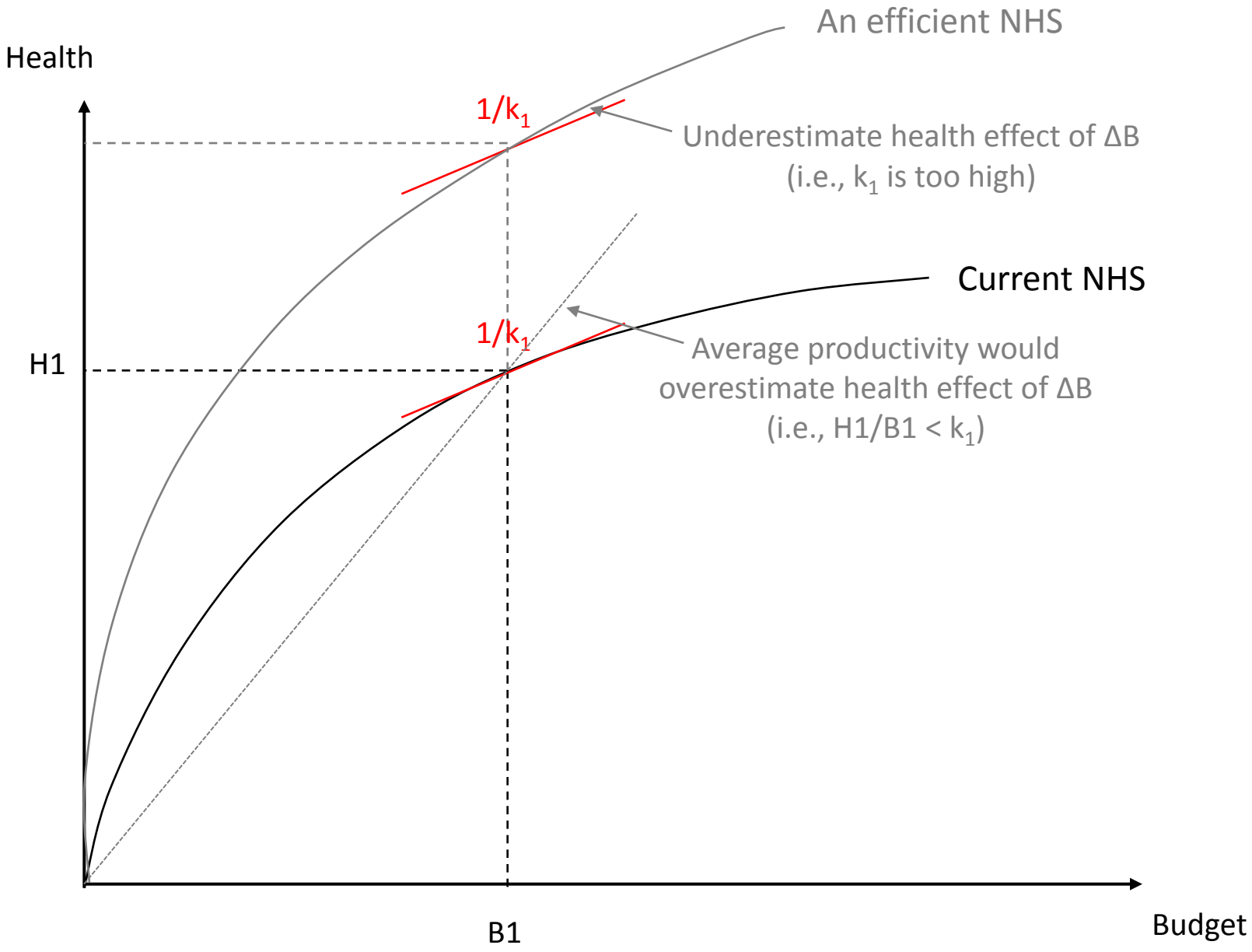
Value: v = how much consumption should we give up for health?

Question of value

Claxton et al, 2010 , 2011 and Paulden 2011

- Specify a complete and legitimate SWF?
  - v is the measure of social welfare and presupposes a complete SWF
    - Health and consumption are the only arguments
    - or separable from other arguments
  - k is simply an inefficient nuisance preventing welfare maximisation
- Complete and legitimate specification of SW not possible?
  - Trade-offs still need to be and are made
  - Legitimate social process reveals something about a latent welfare function
  - Interpret shadow prices as revealed but partial expression of social value
    - k is a revealed expression of social value of health from collective health care
    - v is how much of their consumption individuals are willing to give up to improve their own health
  - So good reasons why $k \neq v$
  - Good reasons to suppose there are other non separable arguments

What it is and what its not



A scientific question of fact

Martin et al 2008, 2009 and MRC/NIHR 2012

- Previously
  - Variations in expenditure and outcomes within programmes
  - Reflect what actually happens in the NHS by PBC

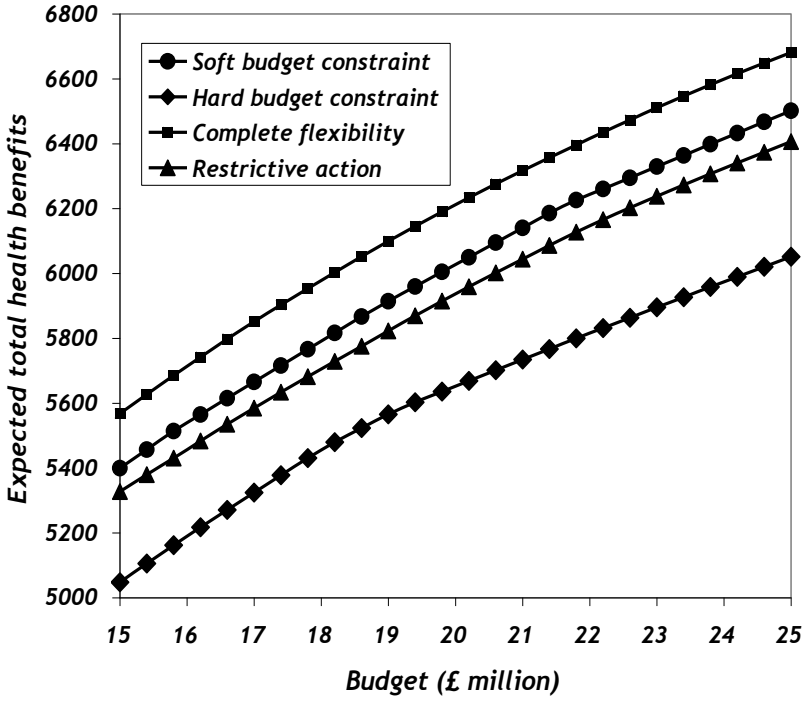
	Cancer	Circulation	Respiratory	Gastro-int
04/05 per LY	£13,137	£7,979		
05/06 per LY	£13,931	£8,426	£7,397	£18,999

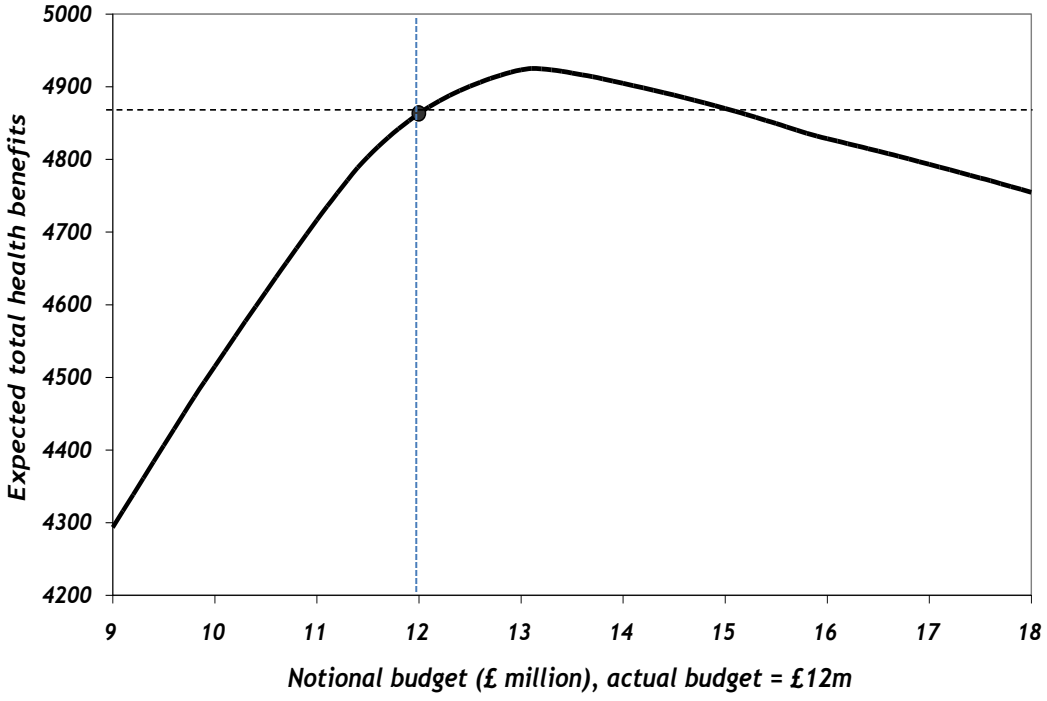
- Need estimate the overall threshold:
  - How changes in overall expenditure gets allocated across all the programmes
  - How changes in mortality might translate into QALYs gained
  - More (all) programmes (types of QALYs displaced)
  - How uncertain is any overall estimate
  - How it changes with scale of expenditure change
  - How it changes over time

Budgetary policies and available actions

Chalabi et al 2008, and McKenna et al 2010

- Hard constraints with uncertain and variable costs and outcomes
  - Corner solutions or exogenous parameters
- Model budget, policy, information revealed and available actions
  - Current rules special case of soft constraint
  - No simple ex-ante rules – more cost-effective if hard constraint
    - not meet budget at expectation or maximise expected health outcomes

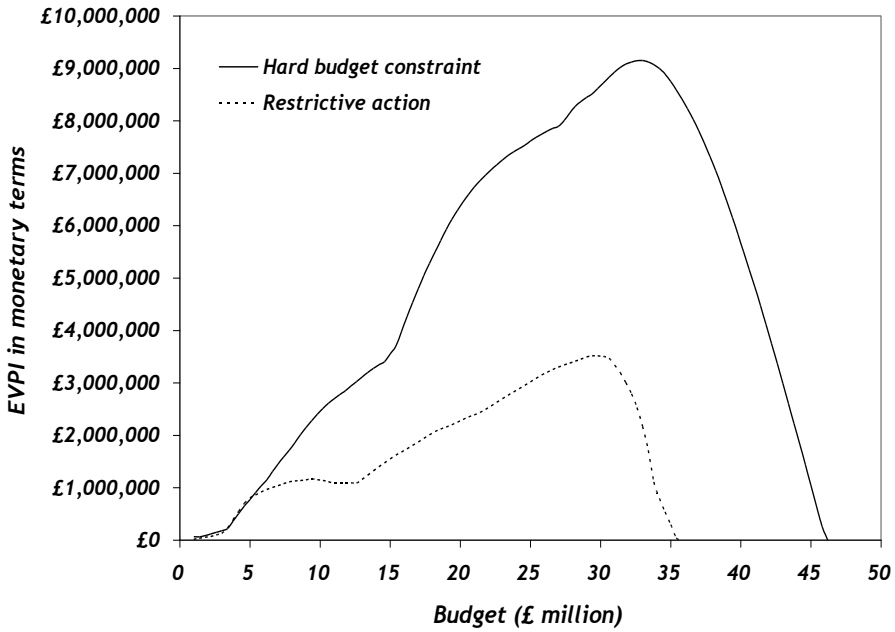


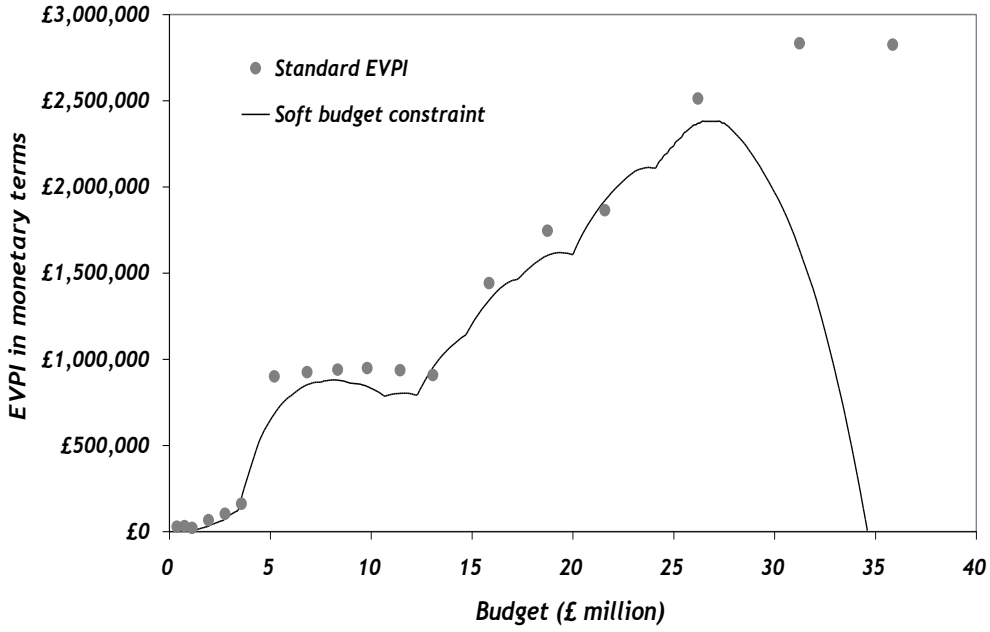


Implications for the value of research

Chalabi et al 2008, and McKenna et al 2010

- How much budget give up to resolve uncertainty?
  - Underestimate value (hard constraints and less available actions)
  - Overestimate (soft constraint)
- EVI based on current decision rules are a special case
  - Soft constraint and buy as much health as you like at a constant rate (k)
- Variability and uncertainty matters
  - Approval and research decisions

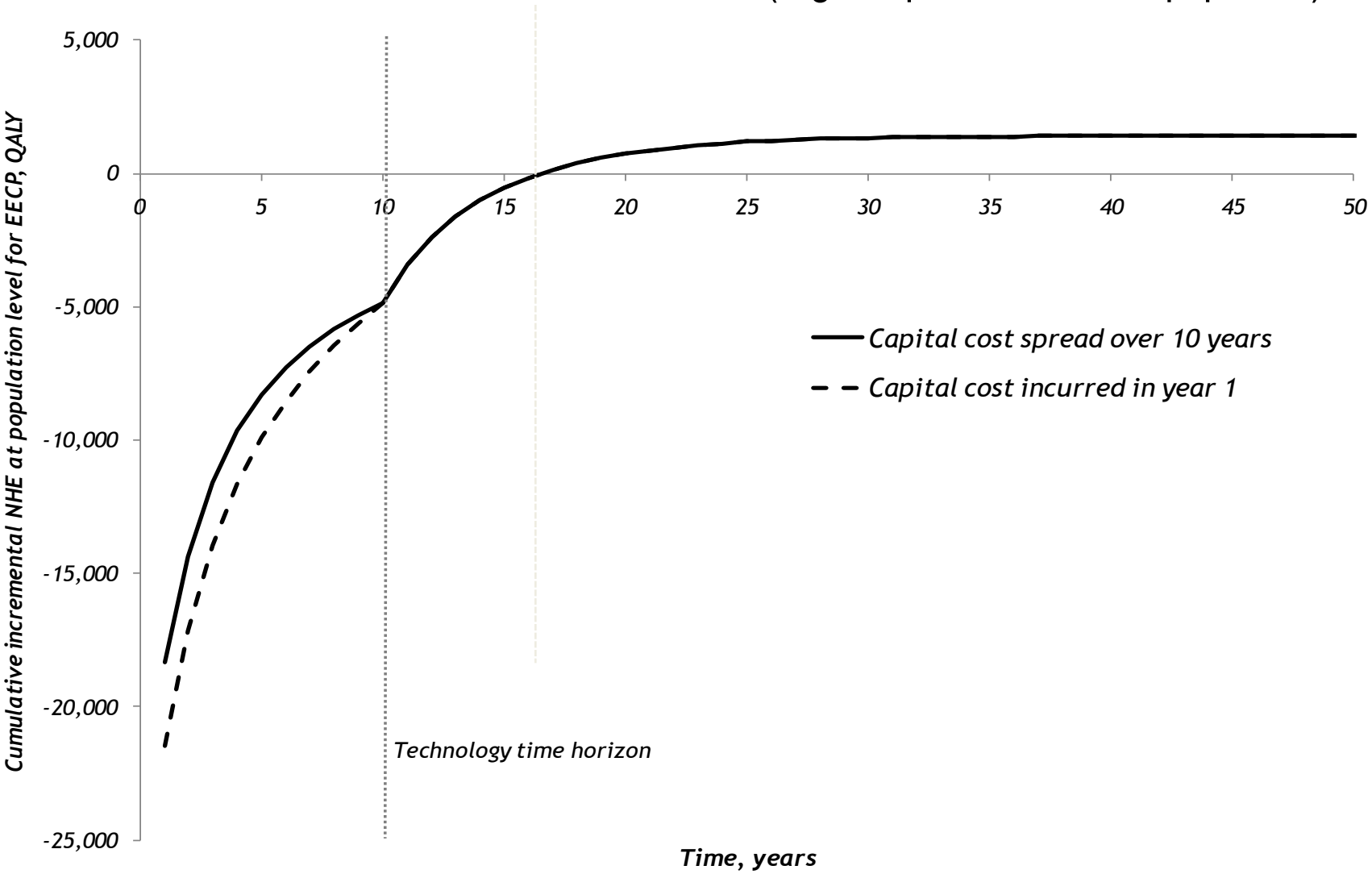




Irrecoverable (opportunity) costs

McKenna and Claxton 2011
and MRC/NIHR 2011

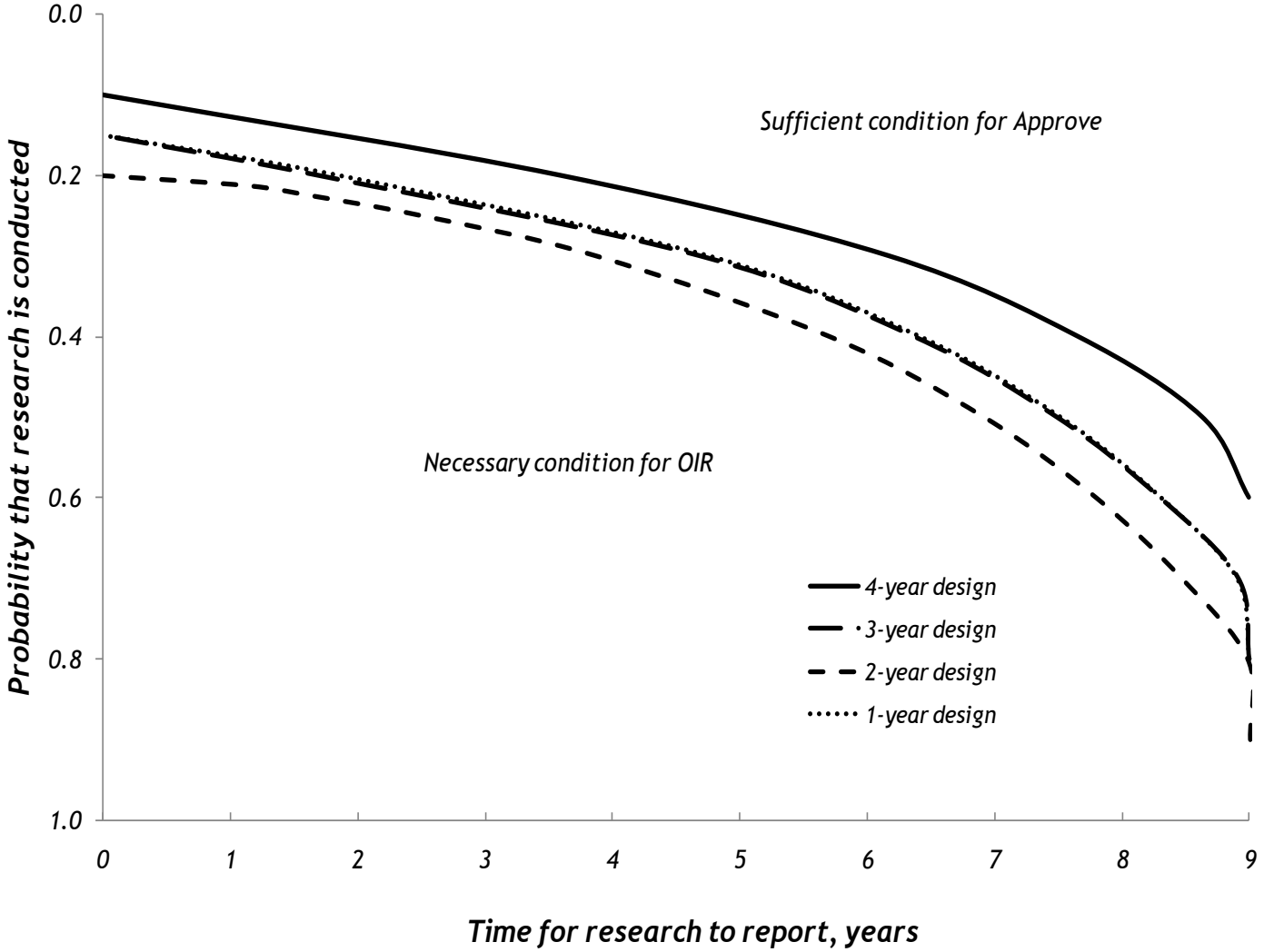
- Irrecoverable per patient treatment costs (NHE profile)
- Irrecoverable costs allocated over time (e.g., capital costs of equipment)



Irrecoverable (opportunity) costs

Griffin et al 2011 and MRC/NIHR 2011

- Research is not possible with approval (incentives and ethics)
- Irrecoverable opportunity cost (value of information forgone)



Where does this leave us?

- Cant fully specify SWF anyway
  - At best partial reflection of social value (cant claim efficient/optimal)
  - Contribute to accountable decisions and progressive change
- No ‘optimal’ simple ex-ante rules
  - Depends on budget, policy, what is revealed and when, and remedial actions available
  - Problem of second best (problem for traditional CBA as CEA)
  - Understand the limitations and implications
- Account for irrecoverable opportunity costs (price thresholds)
  - Reject to approve (only relevant if no uncerinty)
  - Reject to OIR, OIR to Approve (research not possible)
  - Reject to OIR, OIR to AWR, and AWR to Approve