Basic Economic Analysis

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Contents

- Introduction
- Resource use and costs
- Health Benefits
- Economic analysis
- Conclusions

Introduction

- What is economics?
  - Choices under scarcity
  - In health care, to allocate available resources to maximise health benefits
- Why conduct an economic evaluation alongside your clinical trial?
  - Inform decision making by quantifying expected health benefits and costs and the uncertainty around them

Example : RITA-3 trial

- Randomised intervention for treatment of angina
- Patients with unstable angina or non-ST-elevation MI
- Routine early angiography with myocardial revascularisation as indicated *versus* a conservative strategy
- N_t = 895 ; N_c = 915 ; 5 years

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Resource use

- Costs per patient are volume of resource x unit cost of each resource
- Which resource use? Identify 'cost drivers'
  - Angiography, revascularisation procedure, days in ward, ITU and CCU
  - Acute cardiac medication during admission
  - Long term cardiac medication
  - GP and other primary care
  - Hospitalisation for other events
  - What else? Non-cardiac related? Private costs? days lost from work? (Perspective)

Collecting resource use

- Patient specific
  - Trial case record forms
  - Patient questionnaires : Postal? Face-to-face interview?
  - Hospital notes, GP notes
  - Administration system records
  - Resource use diaries
- Other
  - Questionnaire completed by trial coordinator at each centre
  - Collecting resource use on a sample of patients

Unit costs

- Try and obtain local costs if possible
  - Hospital administration / finance dept
  - NHS reference costs (detail available on CD from Quarry House)
  - Questionnaire
  - Expert opinion
- National sources
  - Drugs – BNF and PPA website
  - Other trial reports, HTA reports and NICE appraisals (adjust for inflation)
  - PSSRU website
  - Manufacturers list prices (rarely disclose discounts!)

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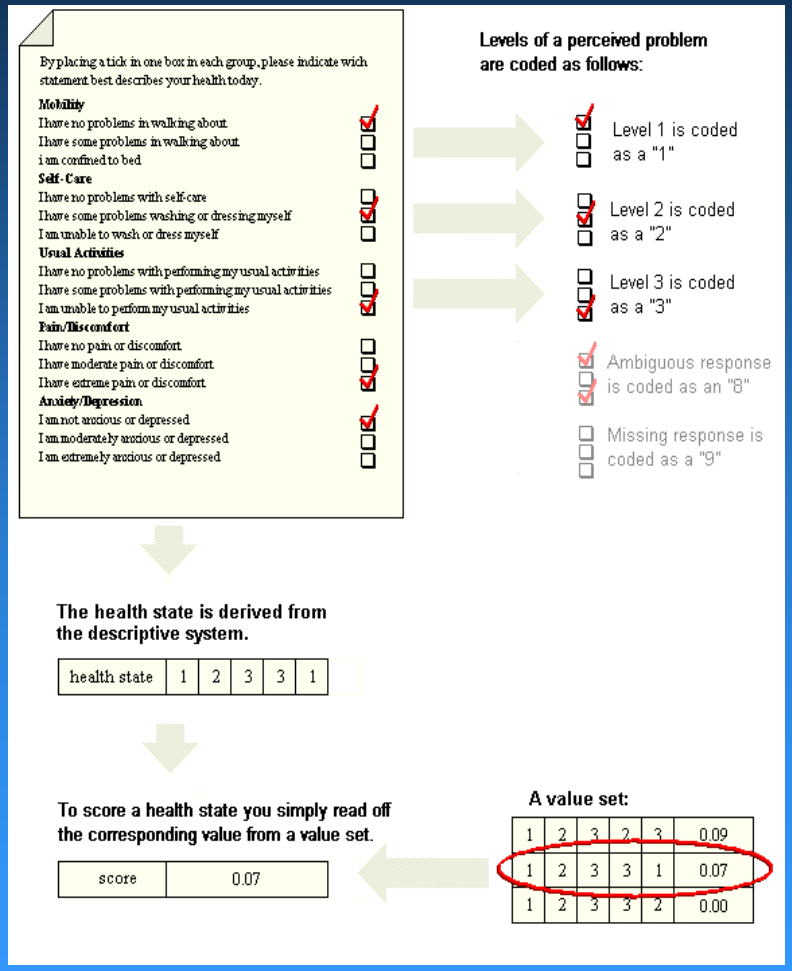
Health Benefits

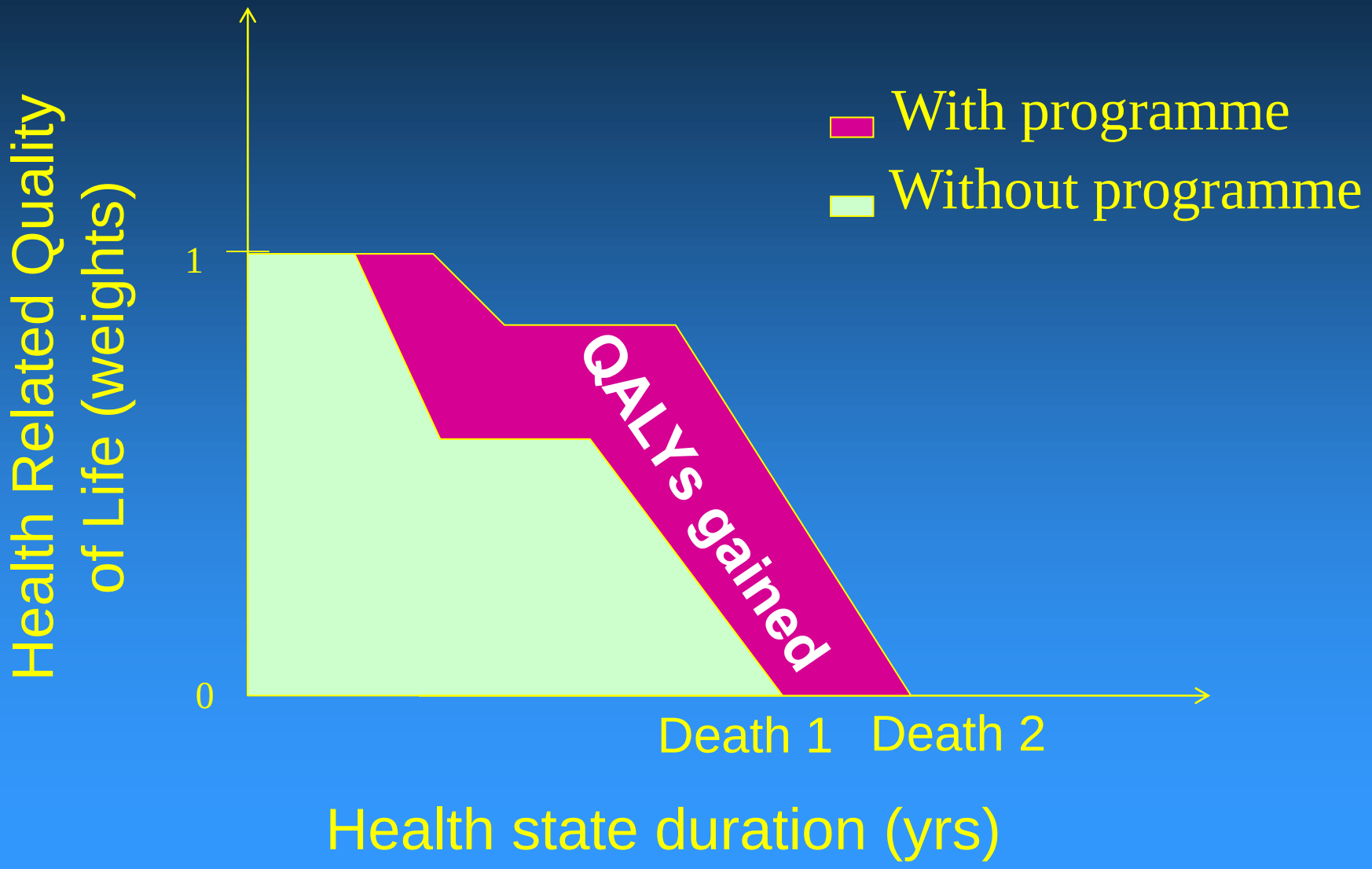
- Disease-specific measures *versus* generic measures *versus* utility measures
  - Disease specific (eg blood pressure) easier to collect but do not easily relate to mortality or health-related quality of life
  - Generic measures may be measured on several dimensions eg SF36
  - Utility measures create a single index number scaled between full health (1) and death (0) , and can be worse than death

The EQ-5D



Values of sample of 3400 members of the general public

Expressing Health Benefit in QALYs



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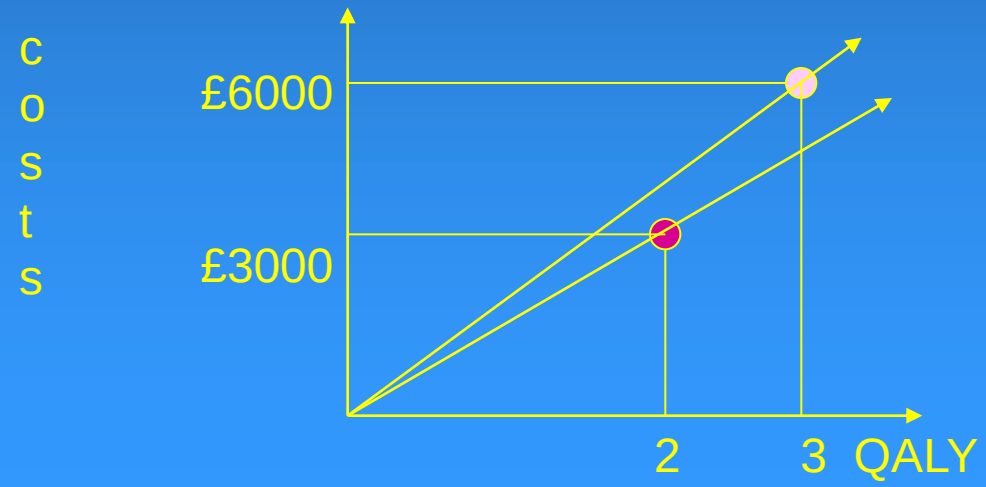
Economic analysis

- What not to do…
  - Don't use cost minimisation analysis
    - Costs and health benefits have a joint distribution, so t-tests of health benefits alone are not valid
  - Don't use average cost-effectiveness ratio

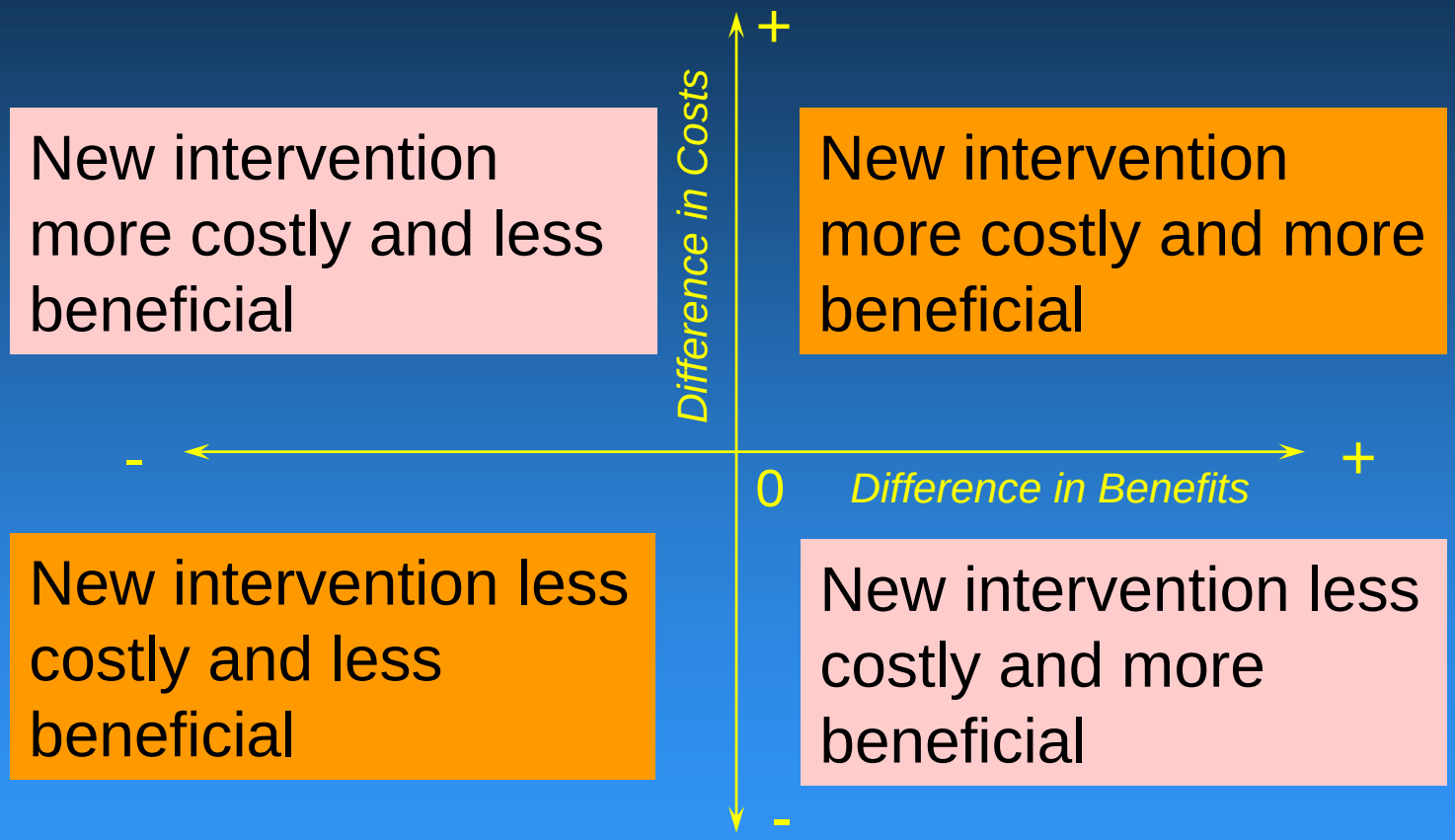


A - £1500 / QALY

B - £2000 / QALY

This only compares A with "do nothing" and B with "do nothing". We want to compare A with B

Economic Evaluation Potential Results



Economic Analysis

- Use incremental cost effectiveness ratio

Decision Rule $= \dfrac{\text{Difference in mean costs}}{\text{Difference in mean benefits}} <$ **Societal valuation of health outcome**

- In previous example ICER = (6000-3000)/(3-2) = £3000 per QALY
- Usually compared with other funded treatments, benchmark around £20-£40000 per QALY gained

RITA-3 Results at 4 years

	Intervention arm n=895	Conservative arm n=915
Mortality	60 deaths	80 deaths
Mean HRQol (change)	0.08	0.06
Total costs	£7593	£6000
Total QALYs	2.579	2.500

Incremental cost effectiveness ratio =
£1593 / 0.079 = 20170

Results are not yet published, therefore illustrative values given instead

Other considerations

- Discount health benefits and costs if>1 year
- Do sensitivity analyses : test robustness of conclusions to changes in assumptions made
- Is the length of the trial 'sufficient' ? Consider extrapolation.
- If follow up time is of different lengths between patients (censoring) special analytical techniques are needed

Conclusions

- Economics is not about saving money.
- It is about trying to do the most good within available resources.
- We all make choices, economic evaluation makes those choices explicit.