



Speaker

Third Plenary Session
Heterogeneity in the Cost-effectiveness of Medical Interventions: The Challenge of Matching Patients to Appropriate Care




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Heterogeneity: matching patients to appropriate care

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Acknowledgments
 Espinoza M, Manca A and Sculpher M

Key Papers
 Basu A, JHE 2011
 Basu and Meltzer, Biopharma Report ASA 2010
 Basu and Meltzer MDM 2007 and 2009



Some definitions

- What matters?
 - Health (gained and forgone for the UK NHS)
 - Net health benefits (NHB)
- Uncertainty
 - Estimates of average NHB for a target population are imprecise
- Variability
 - Differences in NHB within a target population
 - Reasons for differences can not be observed
- Heterogeneity
 - Sources of variability that can be observed (payer or individual)
 - Can inform payer and individual decisions

Turning variability into heterogeneity

- Sources that matter?
 - Anything that effects NHB (treatment effect, baseline risks, preferences, costs etc)
- What would be useful to observe?
 - Group membership
 - NHB given membership
- How can we observe sources of variability?
 - Diagnostic tests, pharmacogenetics, pre-specified subgroup analysis, predictive algorithms
 - How individuals select treatments (reveals something of the joint distribution)
- Information
 - Imperfect (estimates of average NHB are uncertain)
 - Incomplete (don't observe all sources of variability)
 - Asymmetric (individuals might observe more than payers)
 - Group membership
 - NHB given membership (e.g., opportunity for trial and error treatment)

Variability as unexploited value

RCT evidence on NHB of new technology B

Patient ID	A	B
i	2	?
ii	4	?
iii	?	1
iv	?	3
Average	3	2

Averages are uncertain so might be value in a larger sample

What does joint distribution look like?

Patient ID	A	B	Choice	Gain
i	2	1	A	-
ii	4	3	A	-
iii	2	1	A	-
iv	4	3	A	-
Total	12	8		

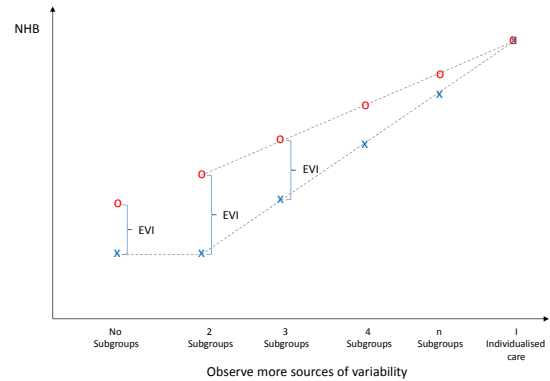
Patient ID	A	B	Choice	Gain
i	2	3	B	1
ii	4	1	A	-
iii	4	1	A	-
iv	2	3	B	1
Total	12	8		

Potential value

0

2

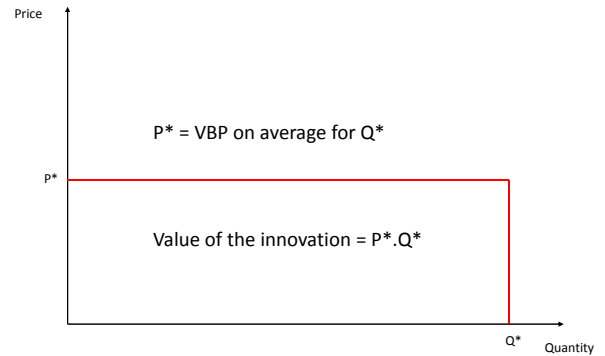
Uncertainty, subgroups and individualised care

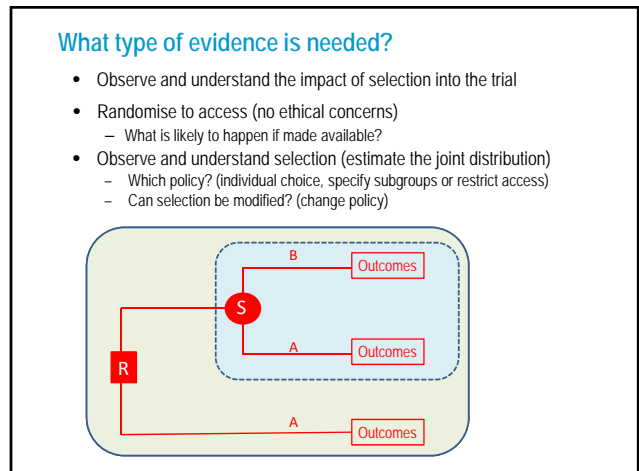
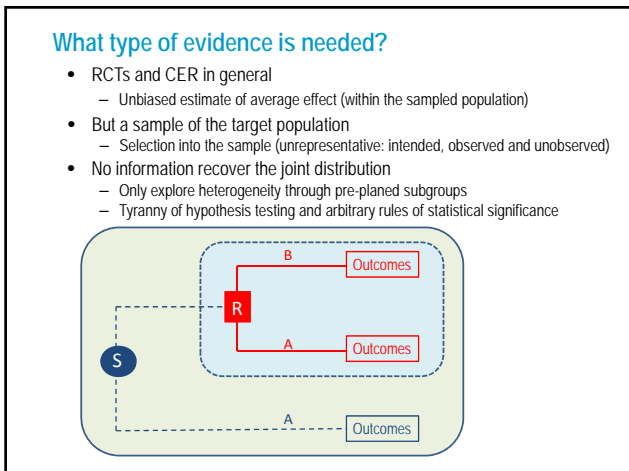
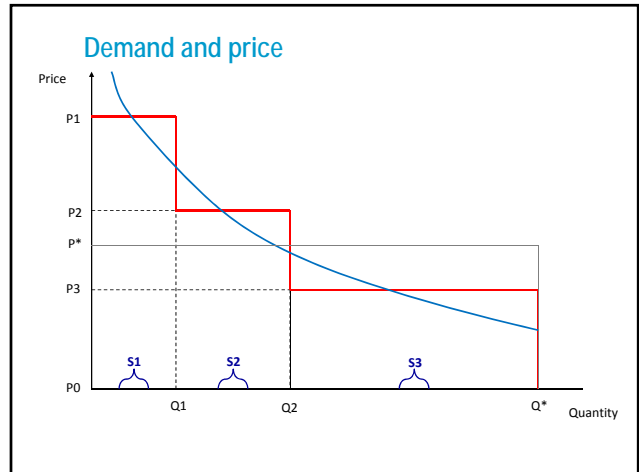
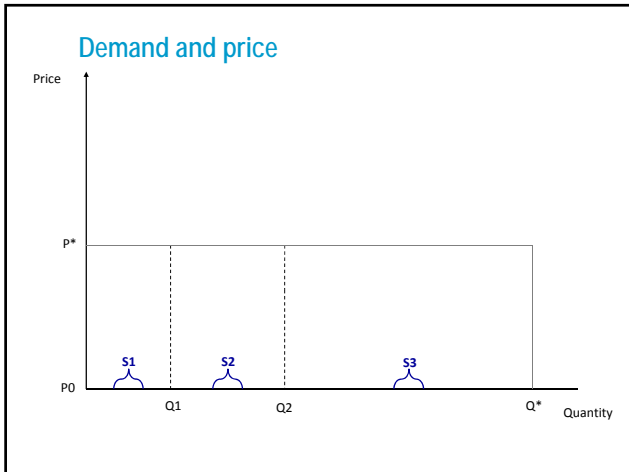


Policy choices (individual choice, subgroups or restrict access)

- Invest resources in:
 - Providing technologies with current information (uncertainty and heterogeneity)
 - Reduce uncertainty (additional evidence about average NHBs)
 - Make sources of variability observable (payers and/or individuals)
 - Or invest in both
- Observing more sources of variability is costly
 - Costs of acquiring the information
 - Group membership and NHB given membership
 - Costly to restrict access to risk particular risk groups (enforce complex guidance)
 - Individual choices are unlikely to meet social objectives
 - Additional uncertainty *is not* a cost
- Understand how individuals select
 - Estimate the joint distribution
 - Understand costs and benefits of individual choice
 - How selection might be influenced

Demand and price





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