

The Role of Information Visualisation in Health Technology Assessment

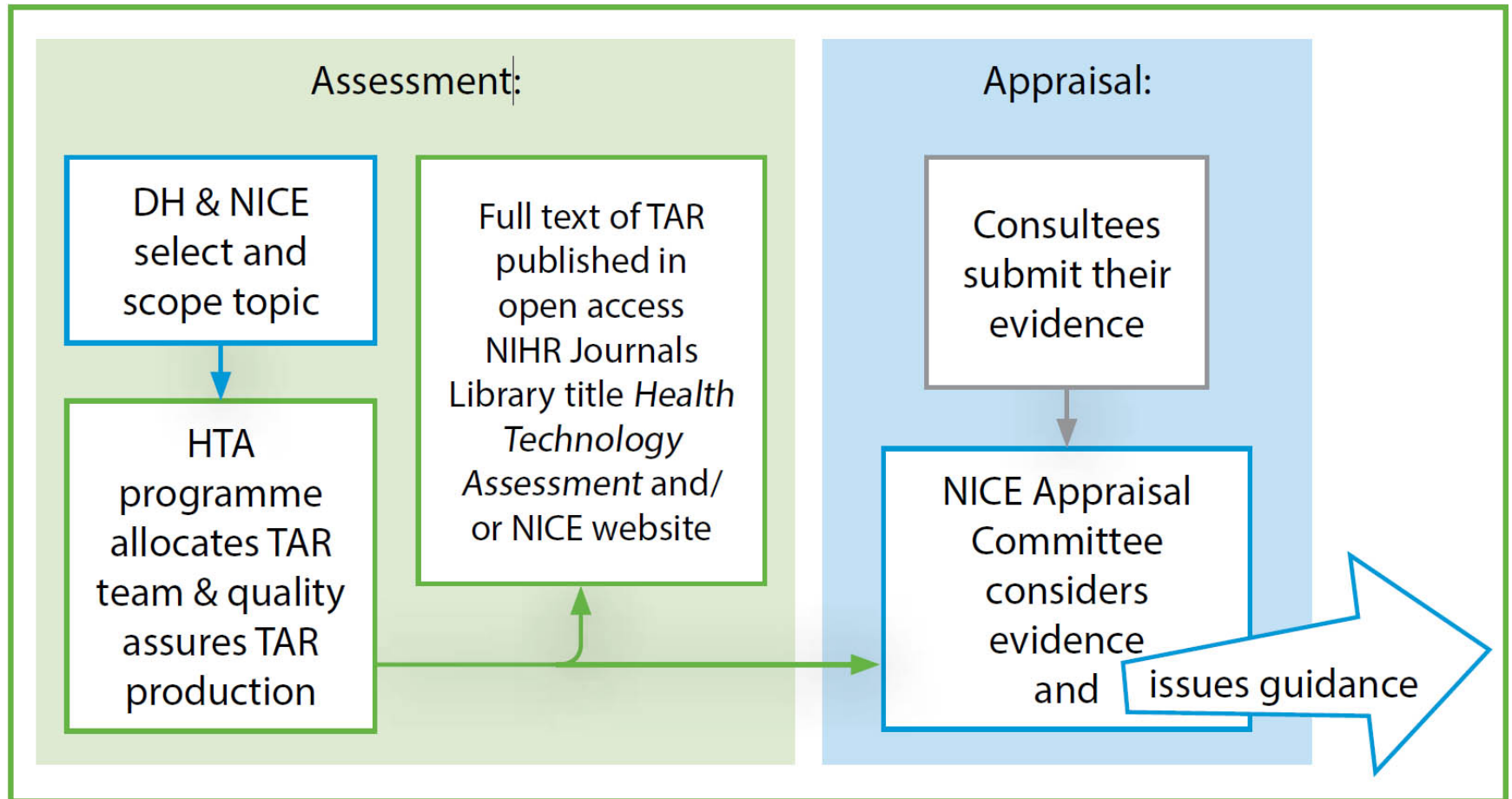
Phuse conference
Basel Switerland : 3 July 2014

Prof. Martin Pitt, Exeter University: Medical School. UK

Talk Schedule

- Setting the Context : NICE & the HTA process
- Visualisation in Systematic Review
- Cost-effectiveness modelling
- How is CE modelling used by NICE
- Dealing with uncertainty
- Information visualisation and HTA
- A reference model for HTA interaction
- Challenges and Futures

What is the HTA programme ?

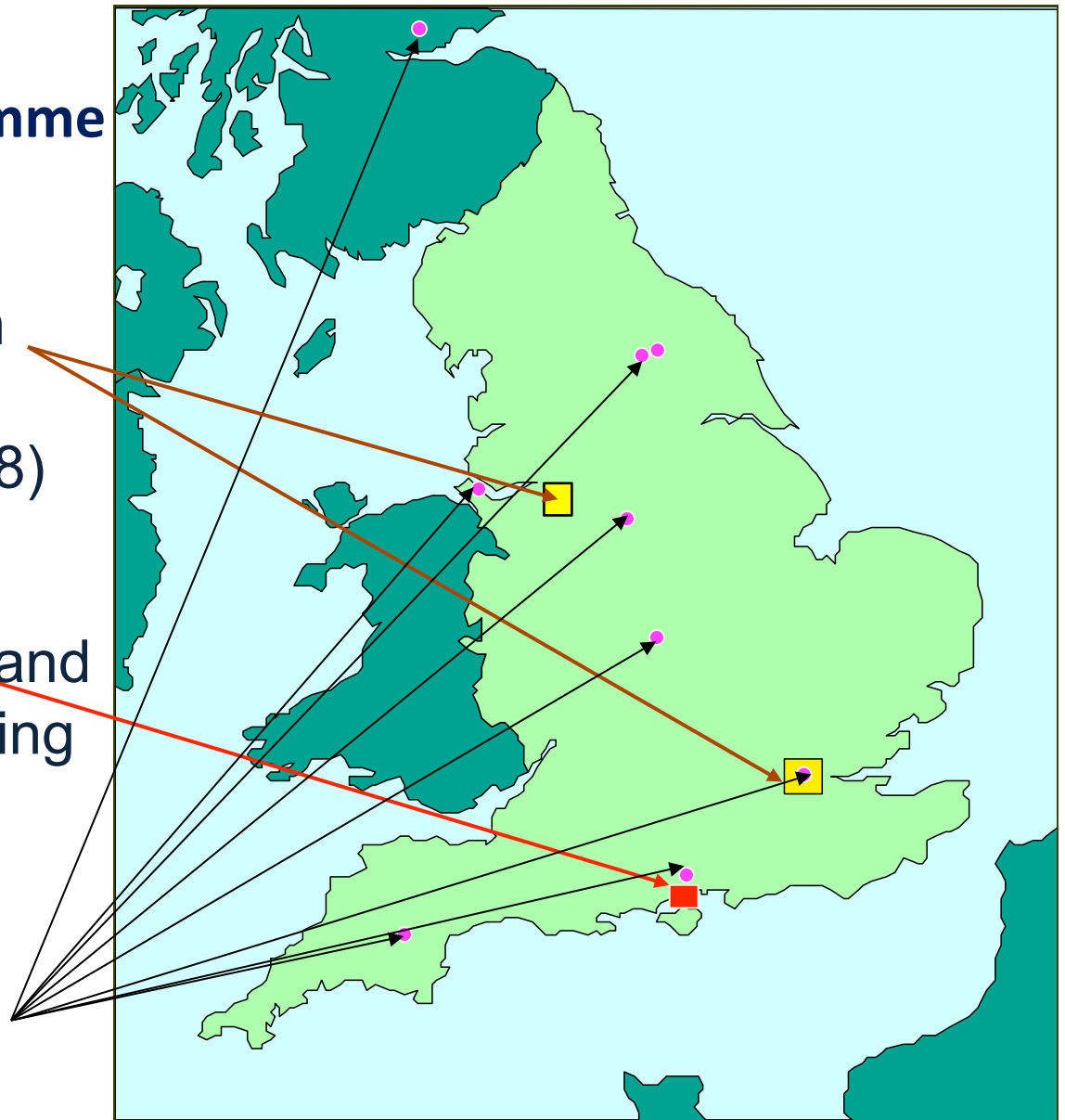


The UK Health Technology Programme

NICE - National Institute for Health and Care Excellence (est. 98)

NETSCC - NIHR Evaluation, Trials and Studies Coordinating Centre

9 Regional T.A. Research Teams



Health Technology Assessment (HTA) Reports



- Two Main Parts
 - Clinical Effectiveness/Systematic review
 - Evidence Synthesis/Meta-analysis
 - Reviews of Trial evidence
 - Comparison of Data sources
 - Cost Effectiveness
 - Economic Modelling, Cost Utility Analysis
 - Sensitivity Analysis/ Probabilistic
 - Interpretation/ Dealing with uncertainty etc.

Daily Mail

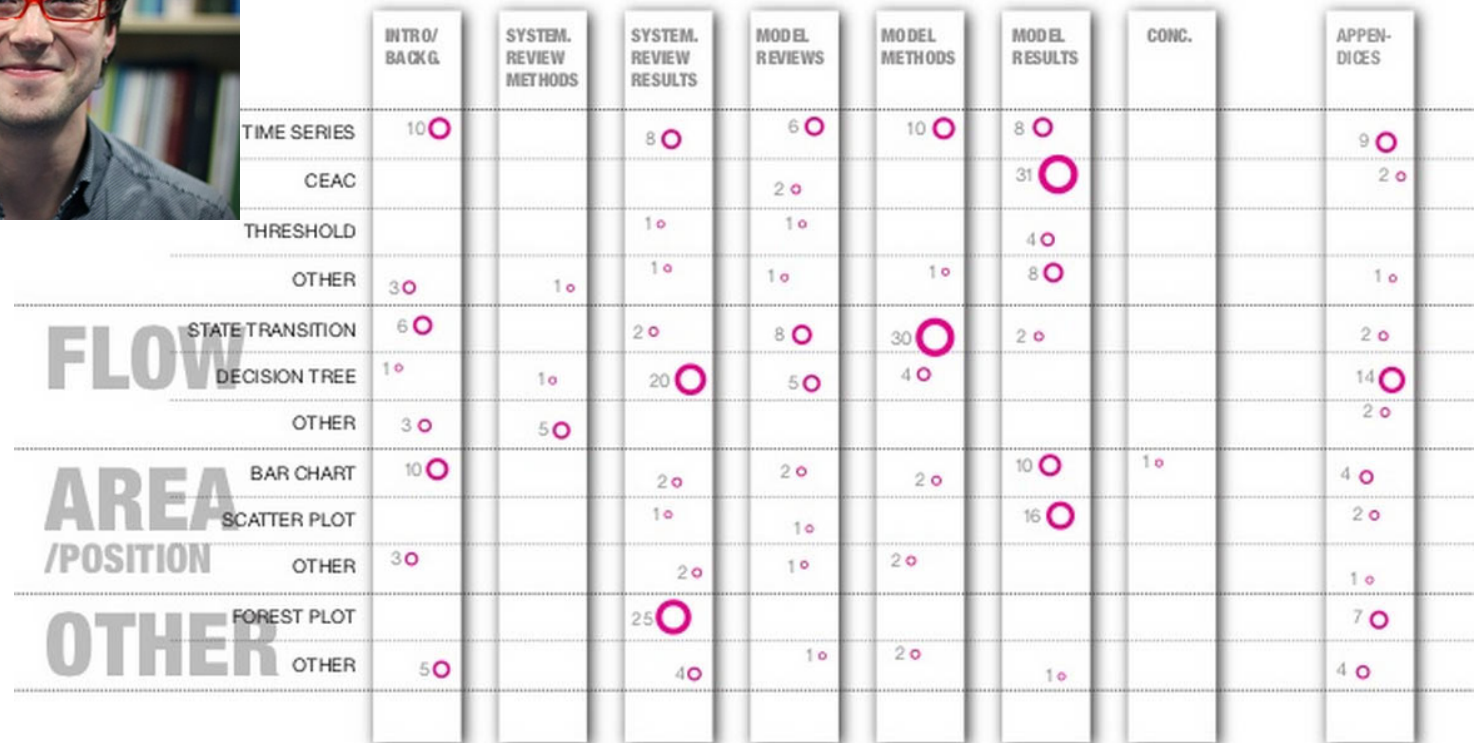
New drugs can give patients with blood cancer months of extra life. So why are thousands denied them?

... NICE had previously ruled in October 2006 that patients with myeloma were not eligible for the drug because it was not considered cost-effective, although its clinical effectiveness was undisputed.

...
The campaigners argued that NICE's initial rejection of Velcade was based mainly on the grounds of cost rather than efficacy, and that this decision was therefore 'perverse and unfair', particularly as the cost of the drug was only just over the £30,000 threshold for NHS drugs. (The NHS has a financial cut-off at £30,000 per person per year; more expensive drugs are not considered cost-effective.)

Daily Mail (London) September 25, 2007, p. 46.

Study in Information graphics



FLOW

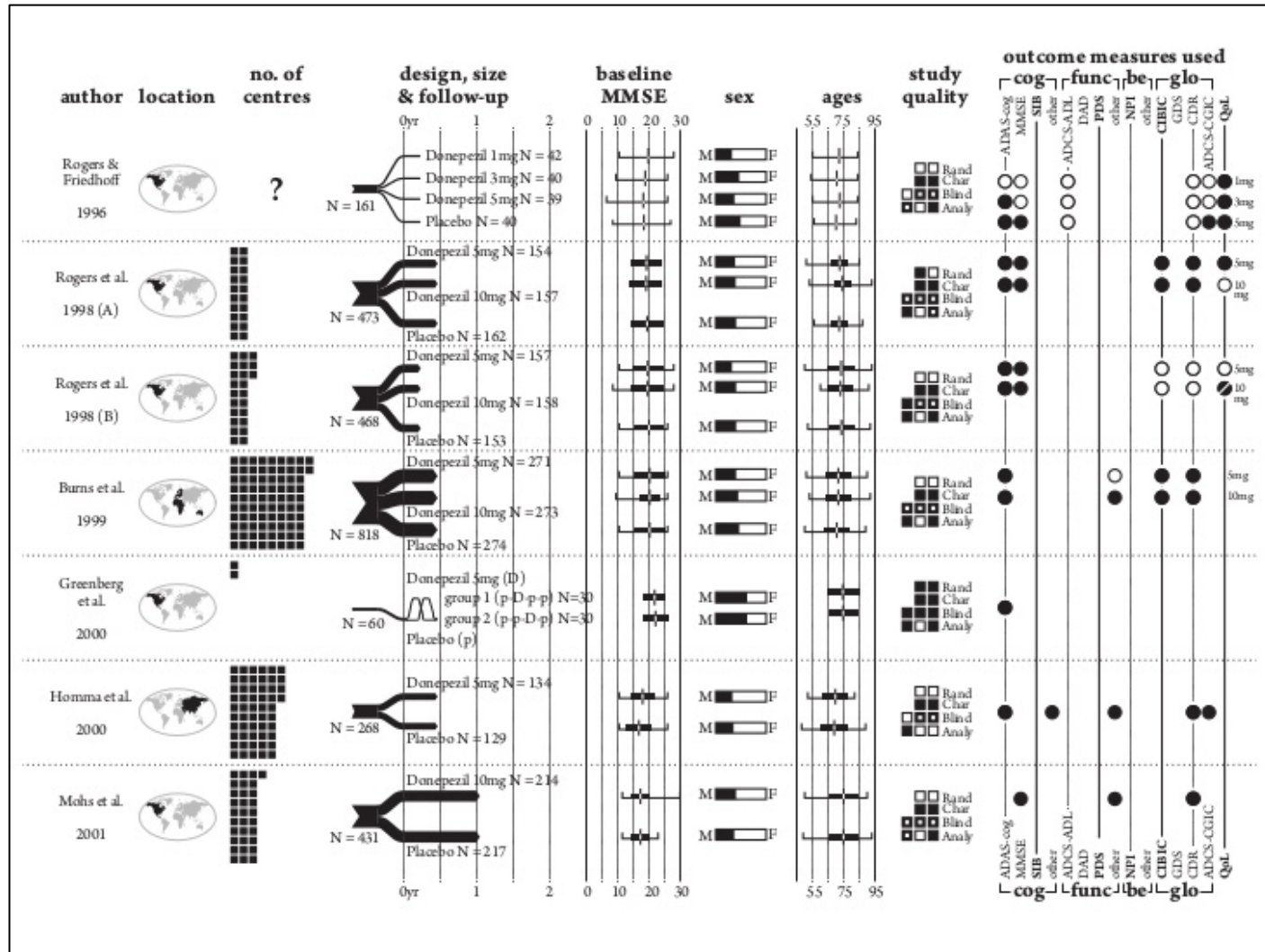
AREA
/POSITION

OTHER

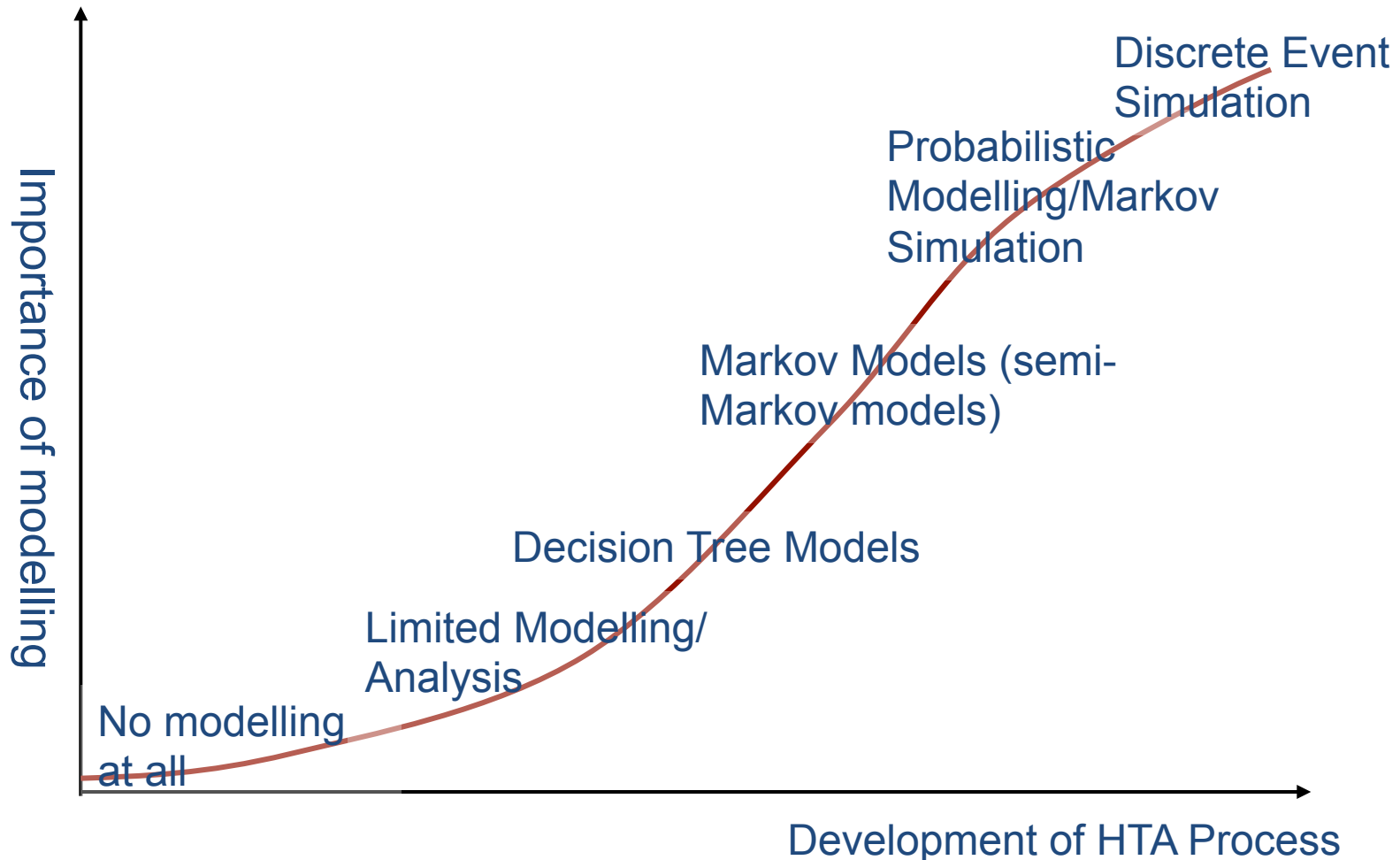


ALL CALCULATIONS FOR CIRCLE SIZES ARE AREA-BASED. SO, A CIRCLE REPRESENTING 50 REPORTS HAS A DIAMETER OF 10mm, AND AN AREA OF 7.9mm². A CIRCLE REPRESENTING 25 REPORTS HAS AN AREA OF 3.9mm² AND A DIAMETER OF 7.1mm.

Systematic Review

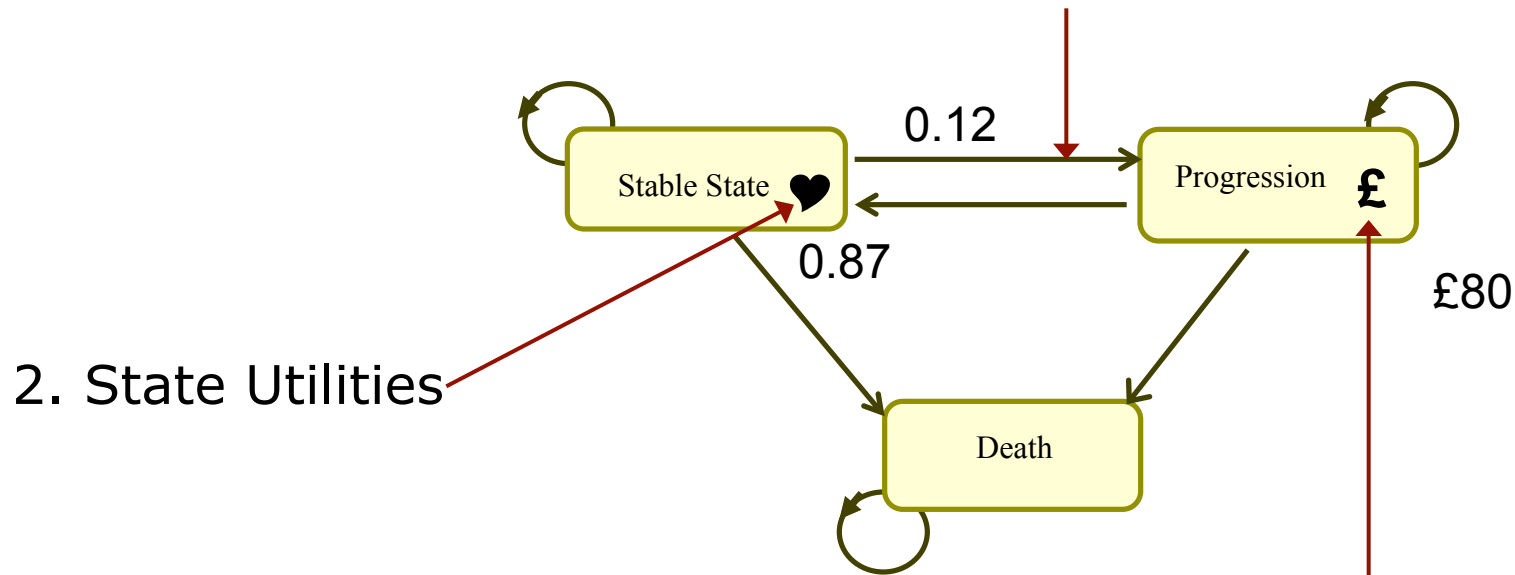


Cost Effectiveness Modelling



Data for Models: Key parameters

1. Transition Probabilities

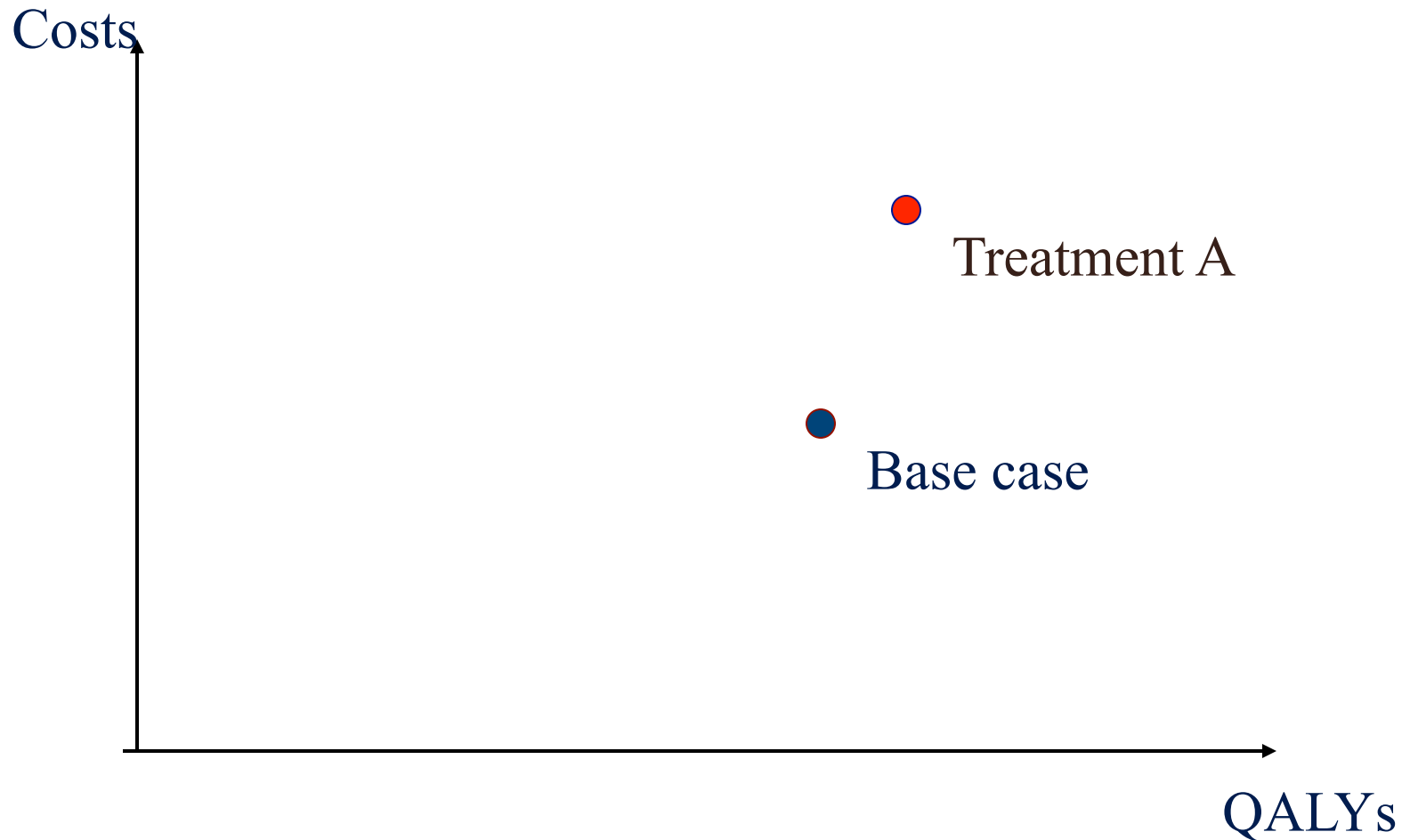


4. Structural Parameters

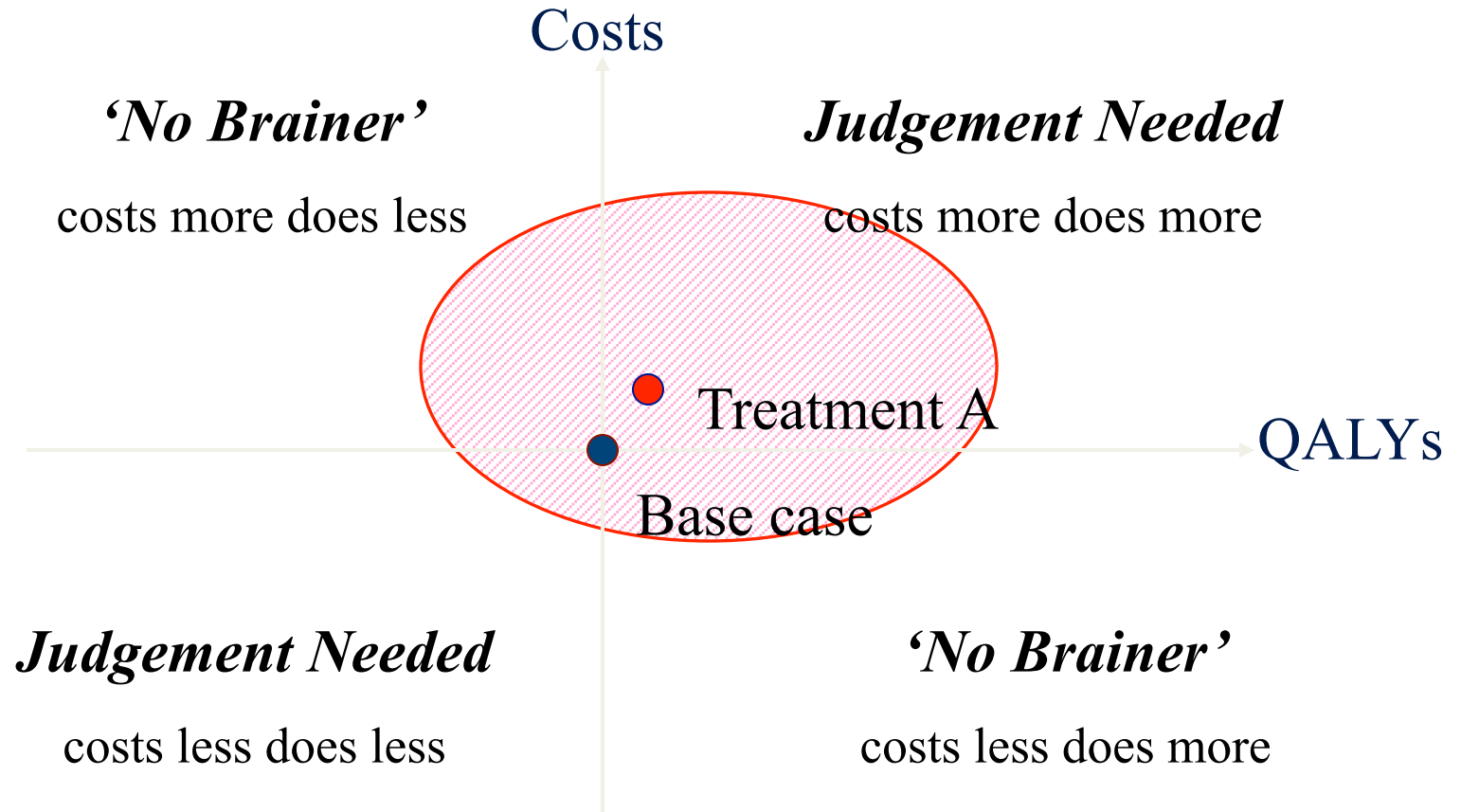
Cycle Time, Time Horizon etc.

3. Costs

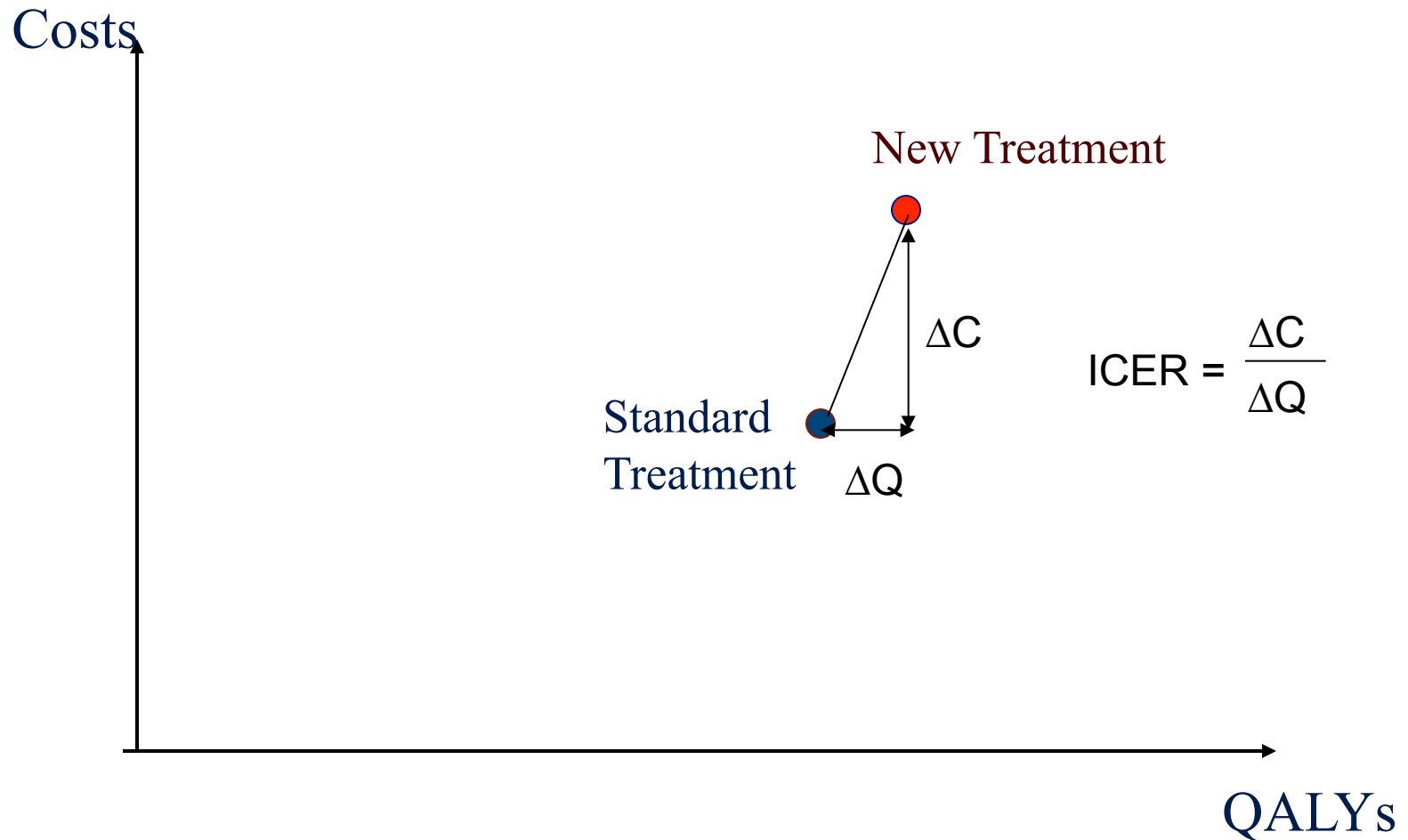
Cost Effectiveness/Utility Plane



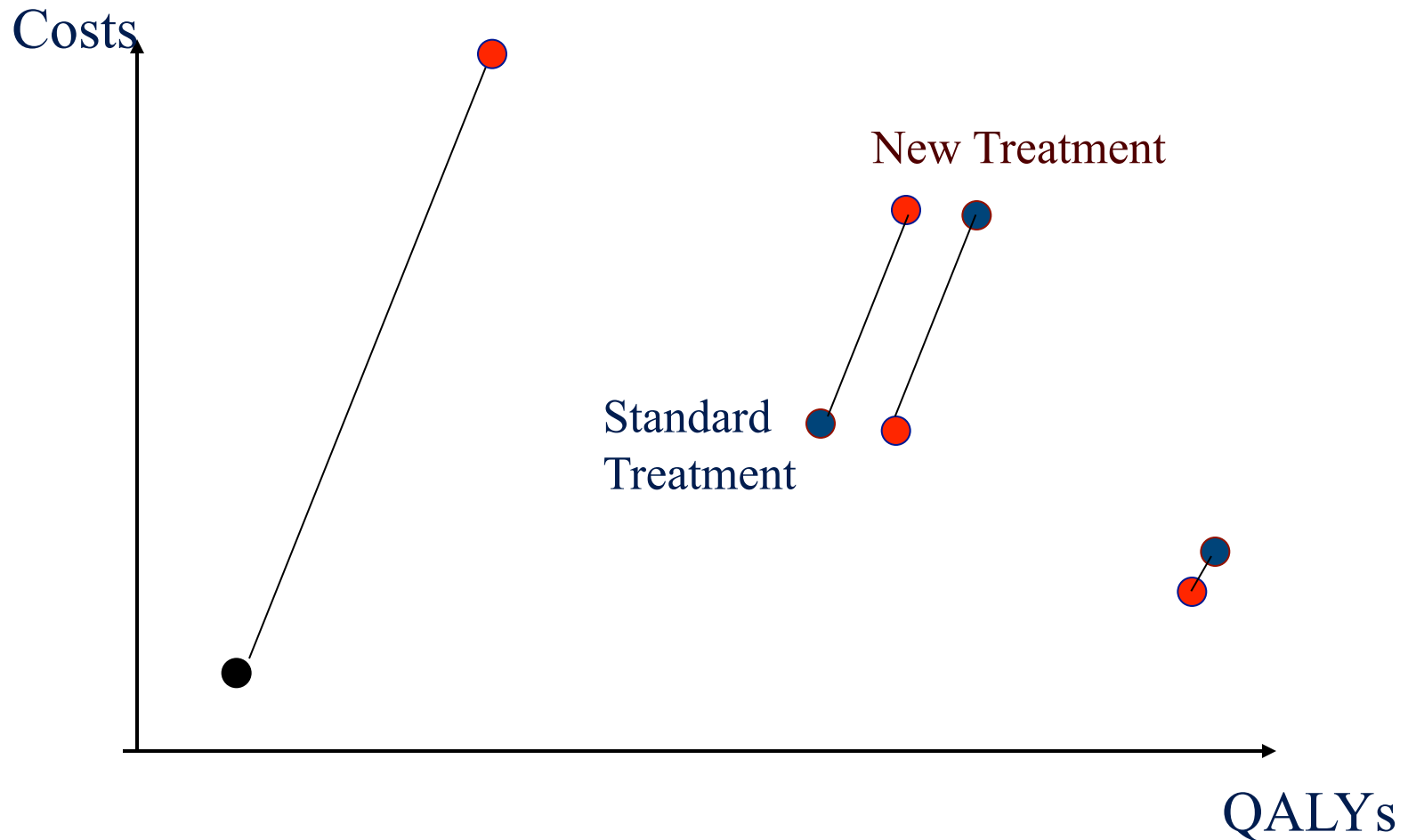
Incremental Cost Effectiveness Graph



The Incremental Cost-Effectiveness Ratio (ICER) output

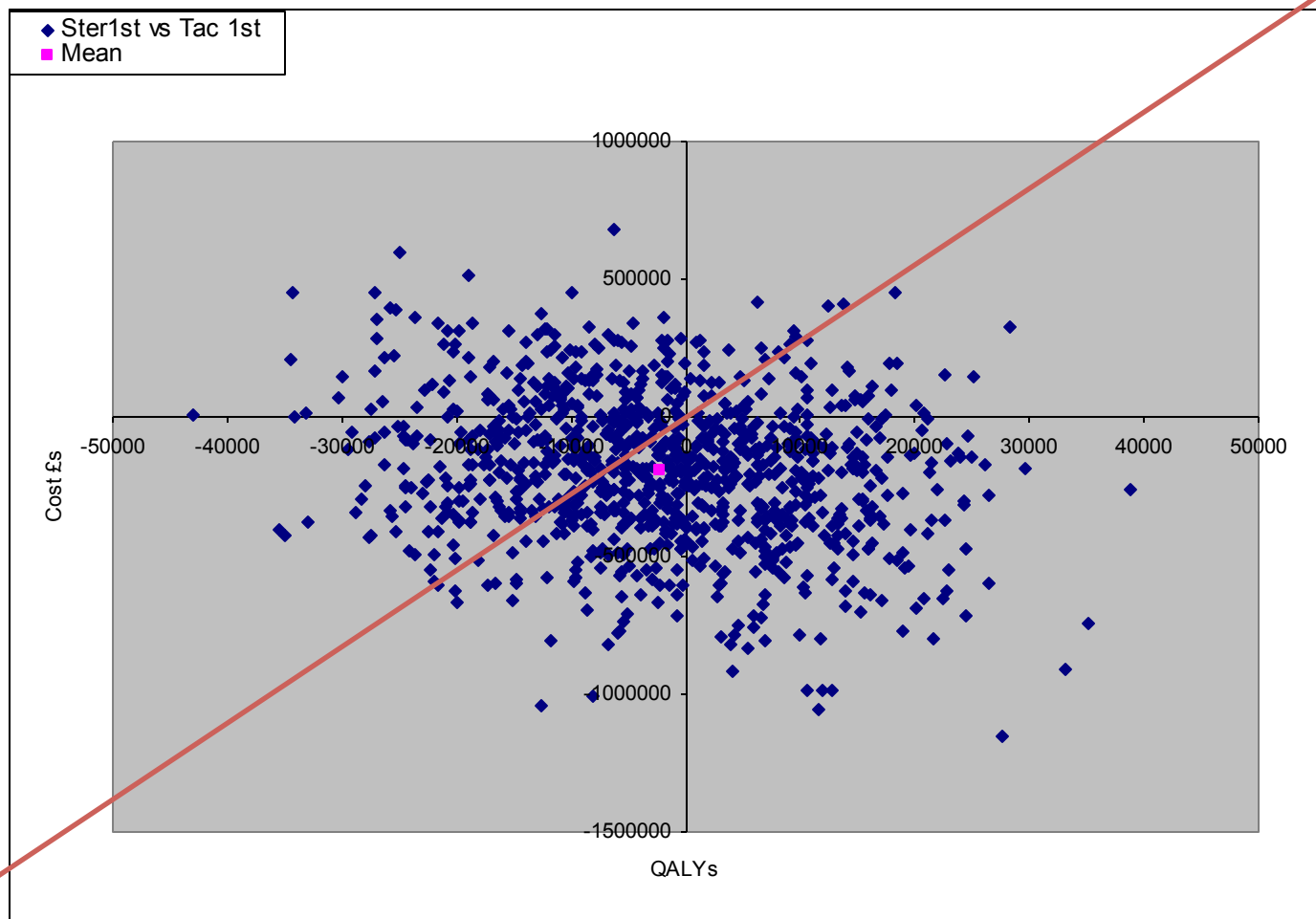


The Incremental Cost-Effectiveness Ratio (ICER) output

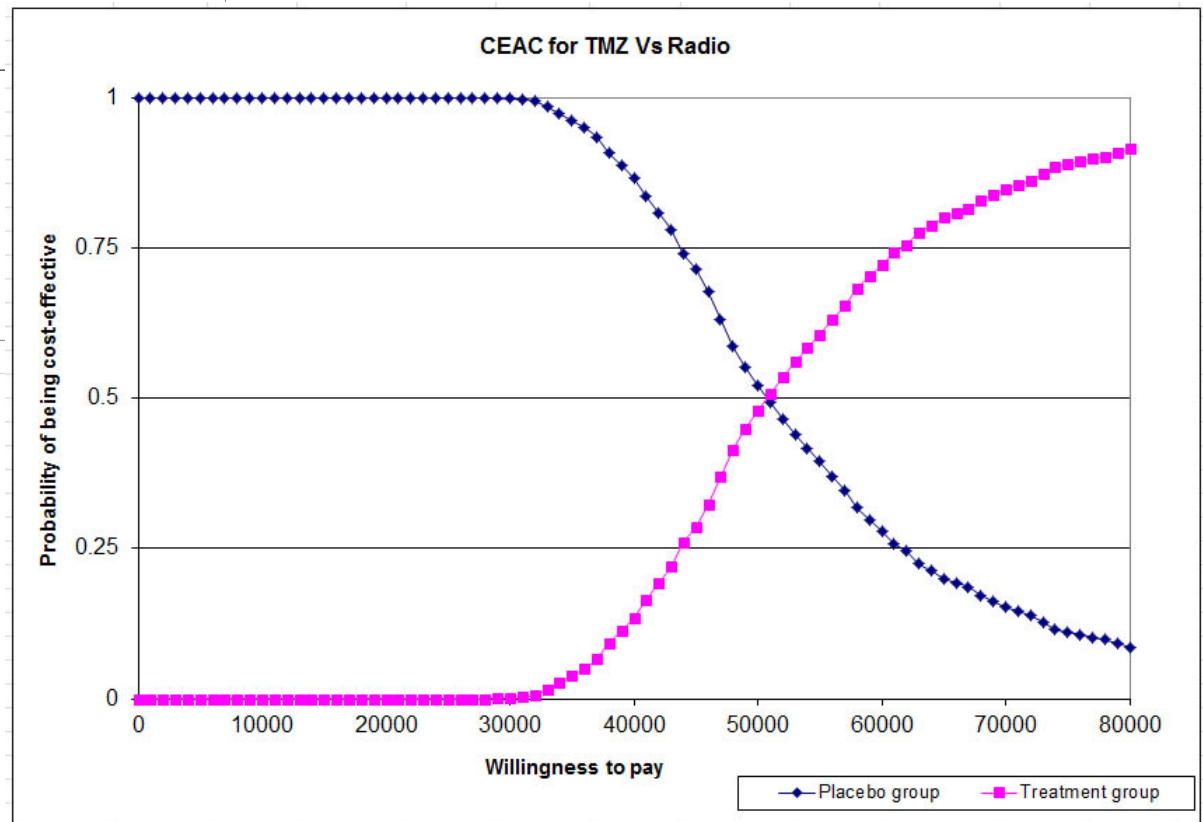
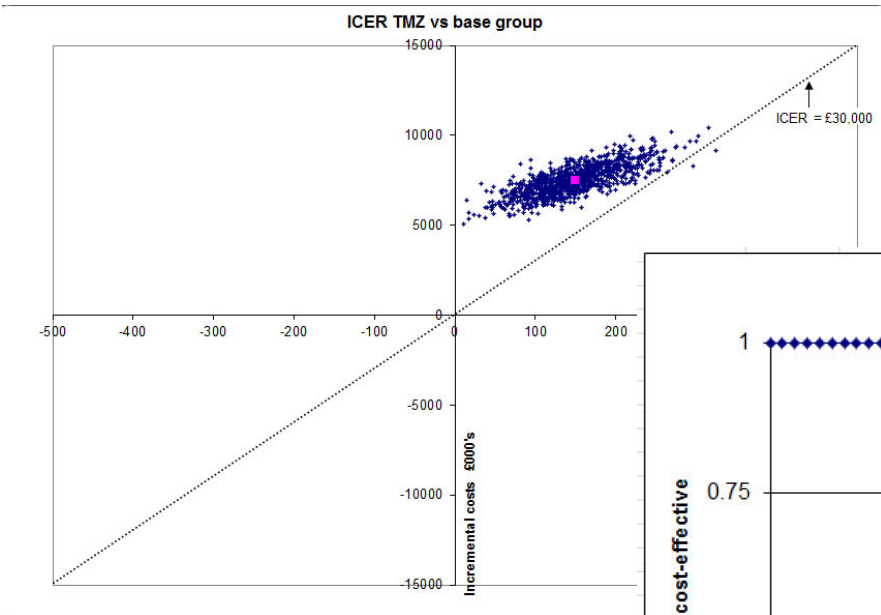


Incremental Cost Effectiveness Ratio

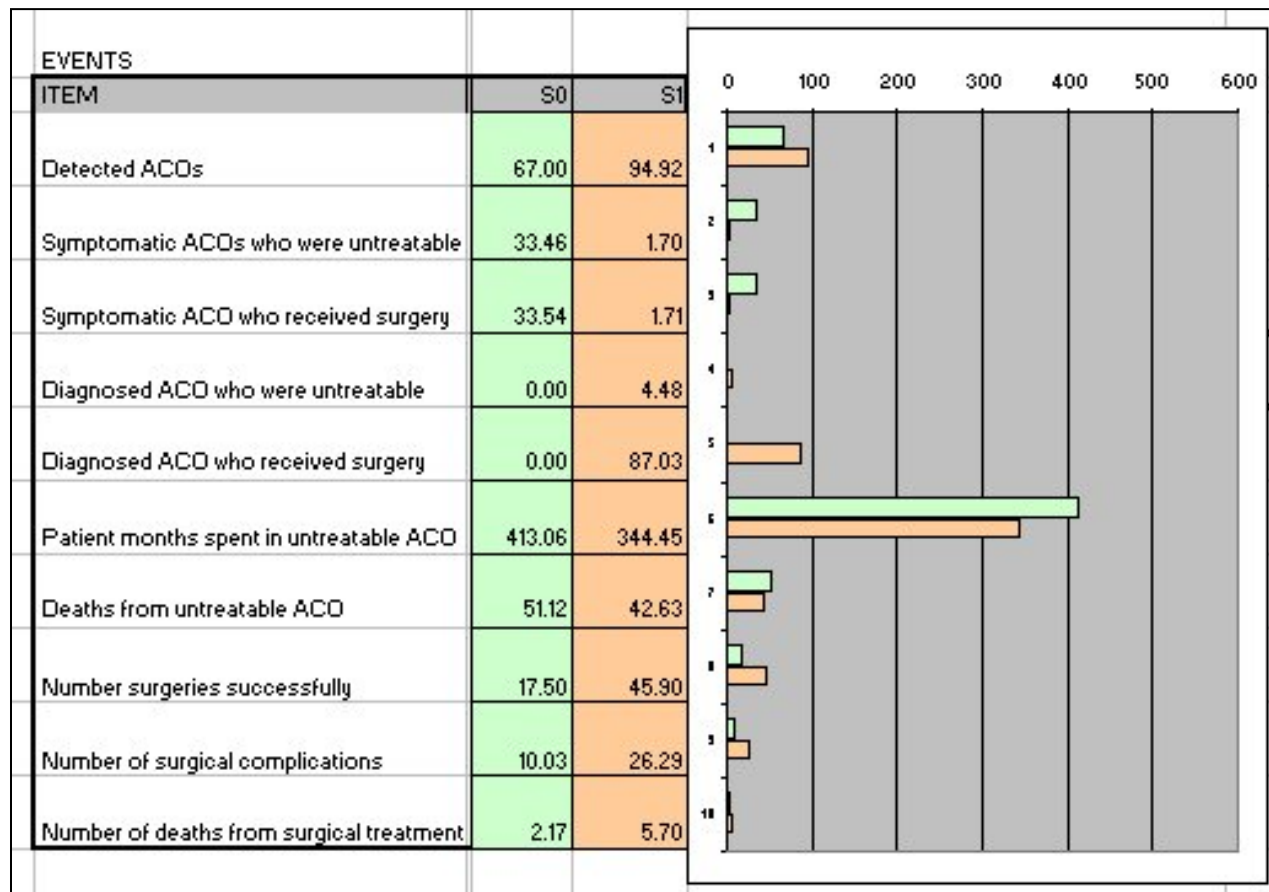
ICER =
£30K



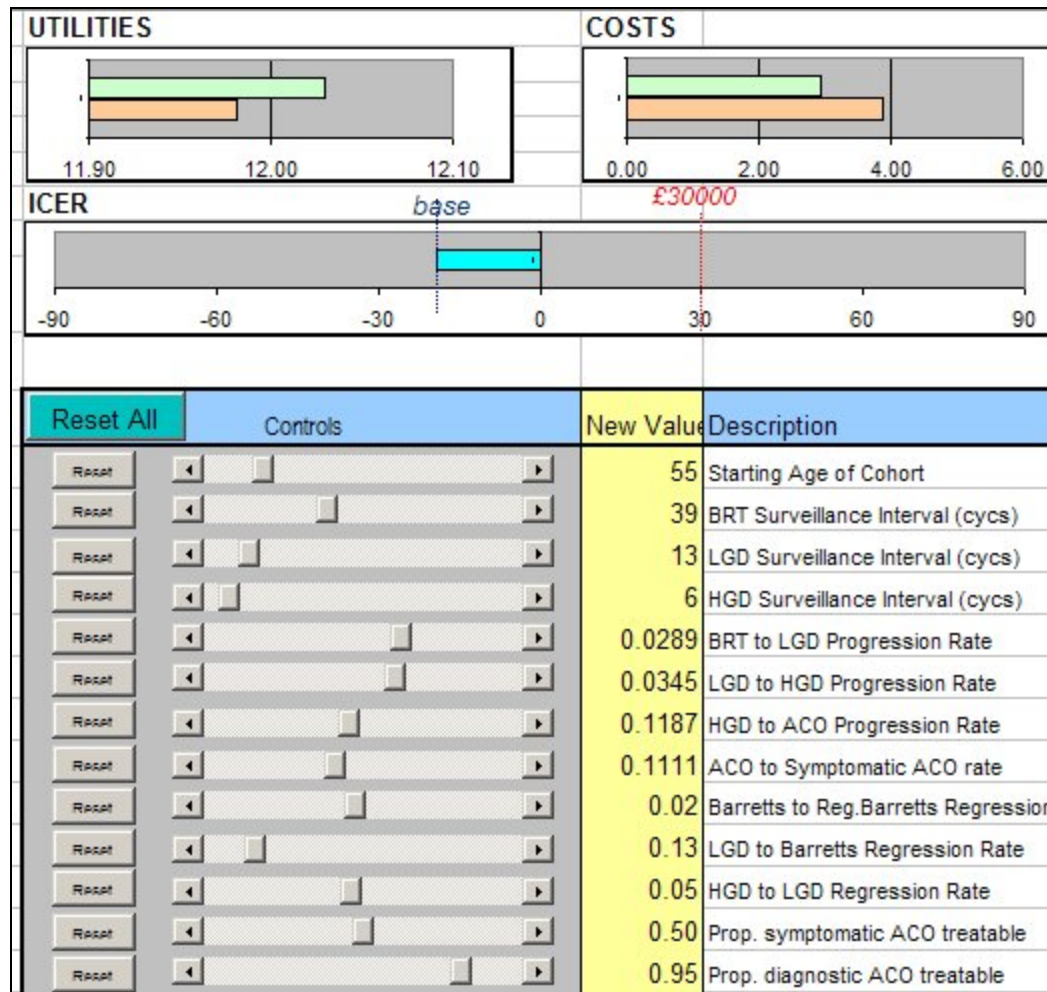
Cost Effectiveness Acceptability Curve



Example 1 - Events

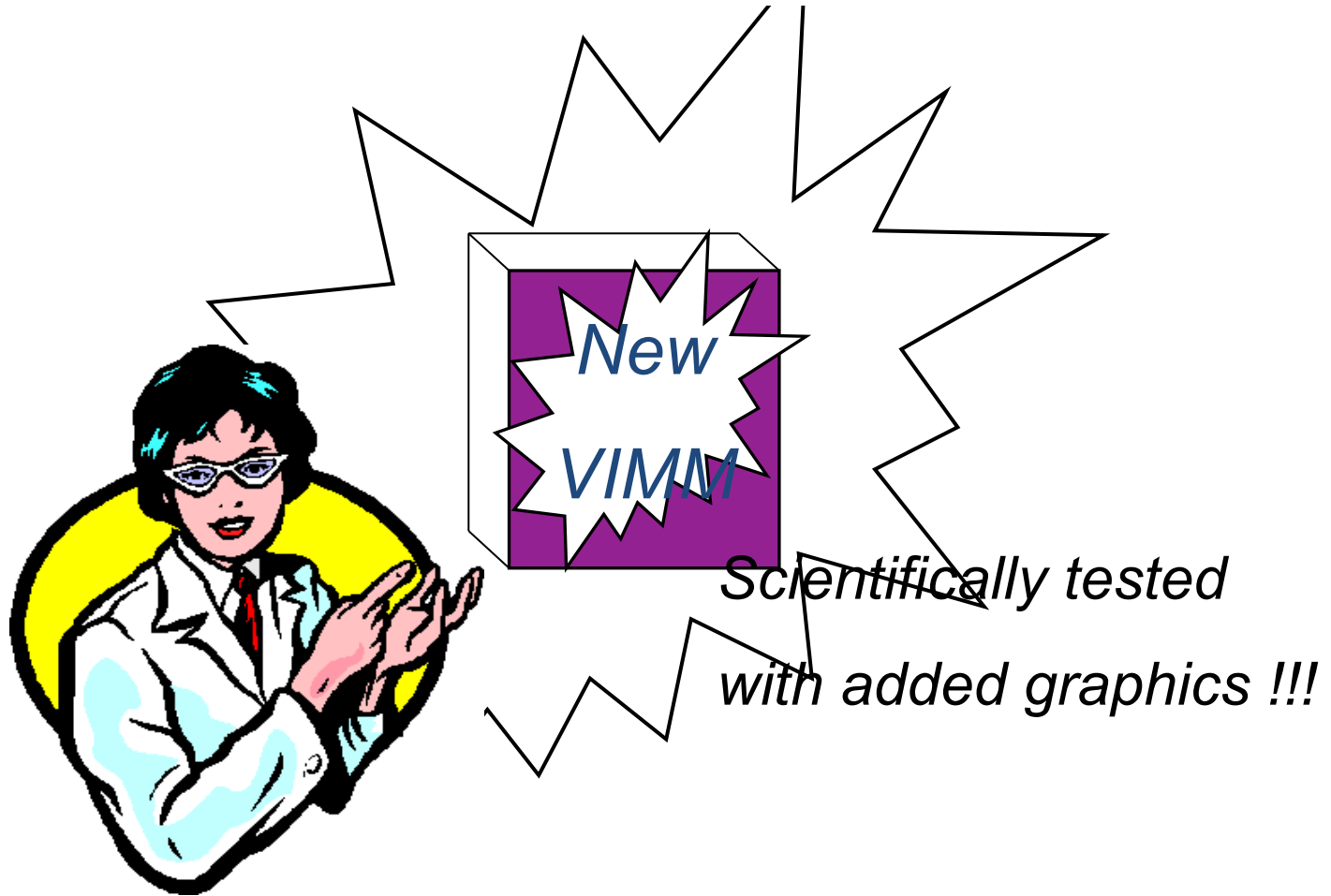


Example 2 - Sensitivity Mixing

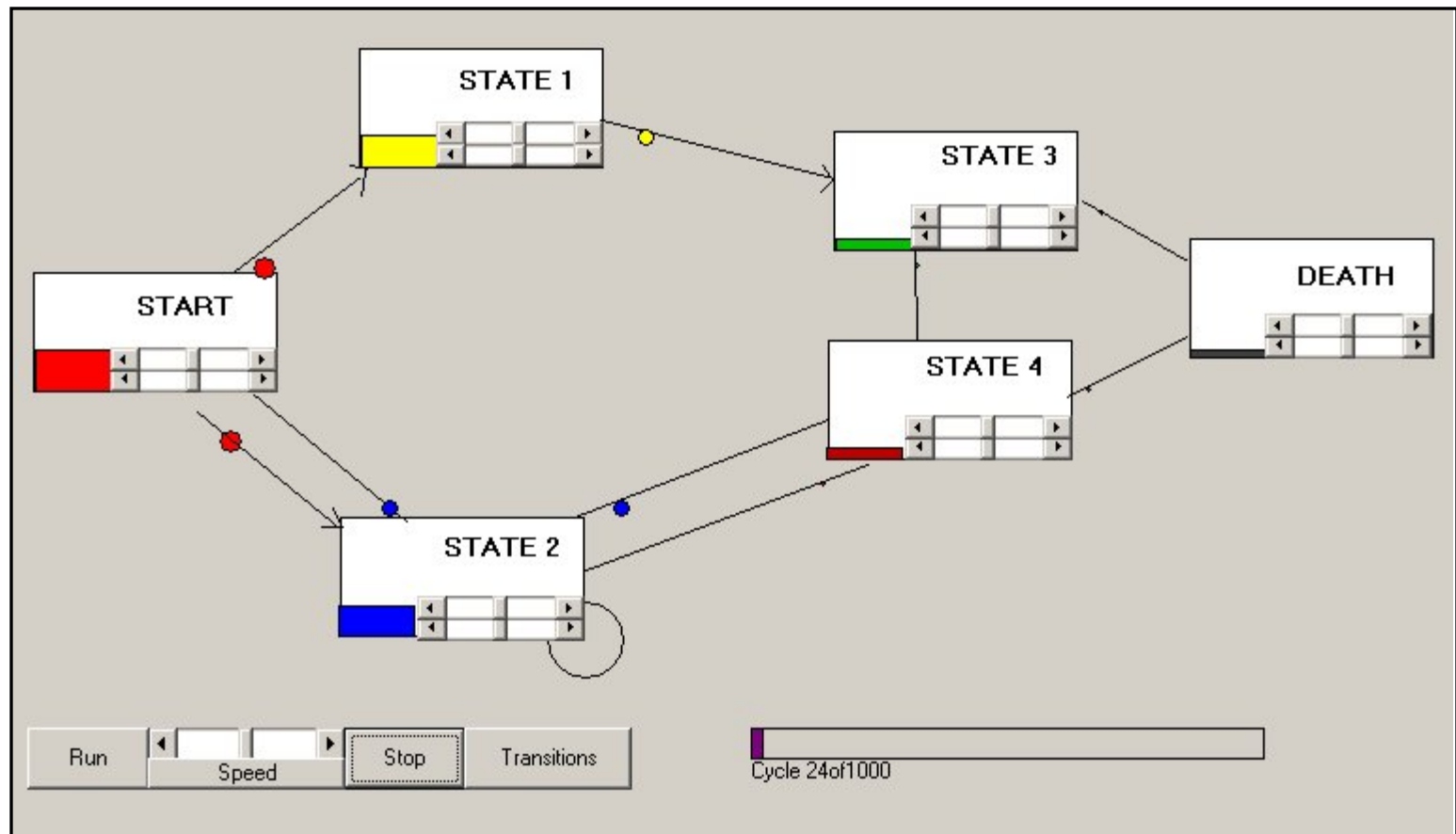


Example 3 – VIMM

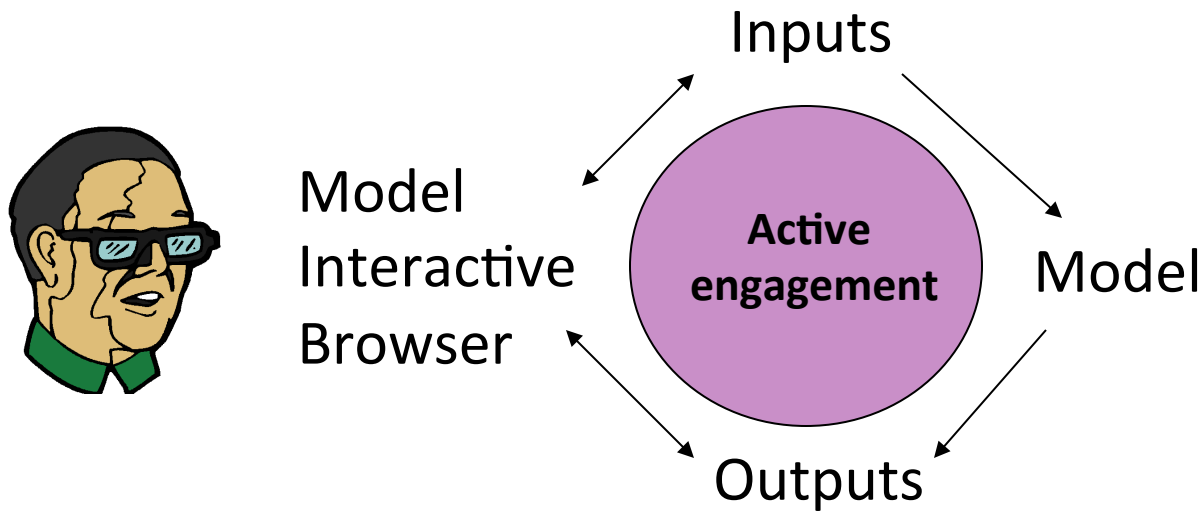
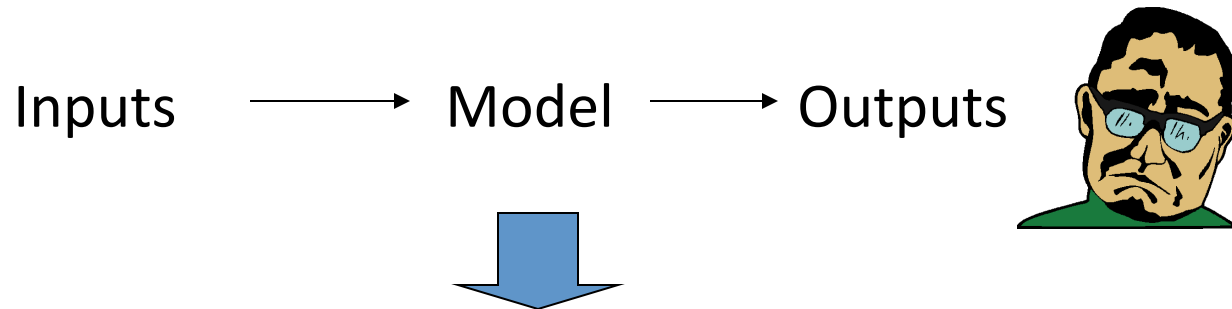
Visual Interactive Markov Modelling



VIMM Prototype



Changing models use in HTA

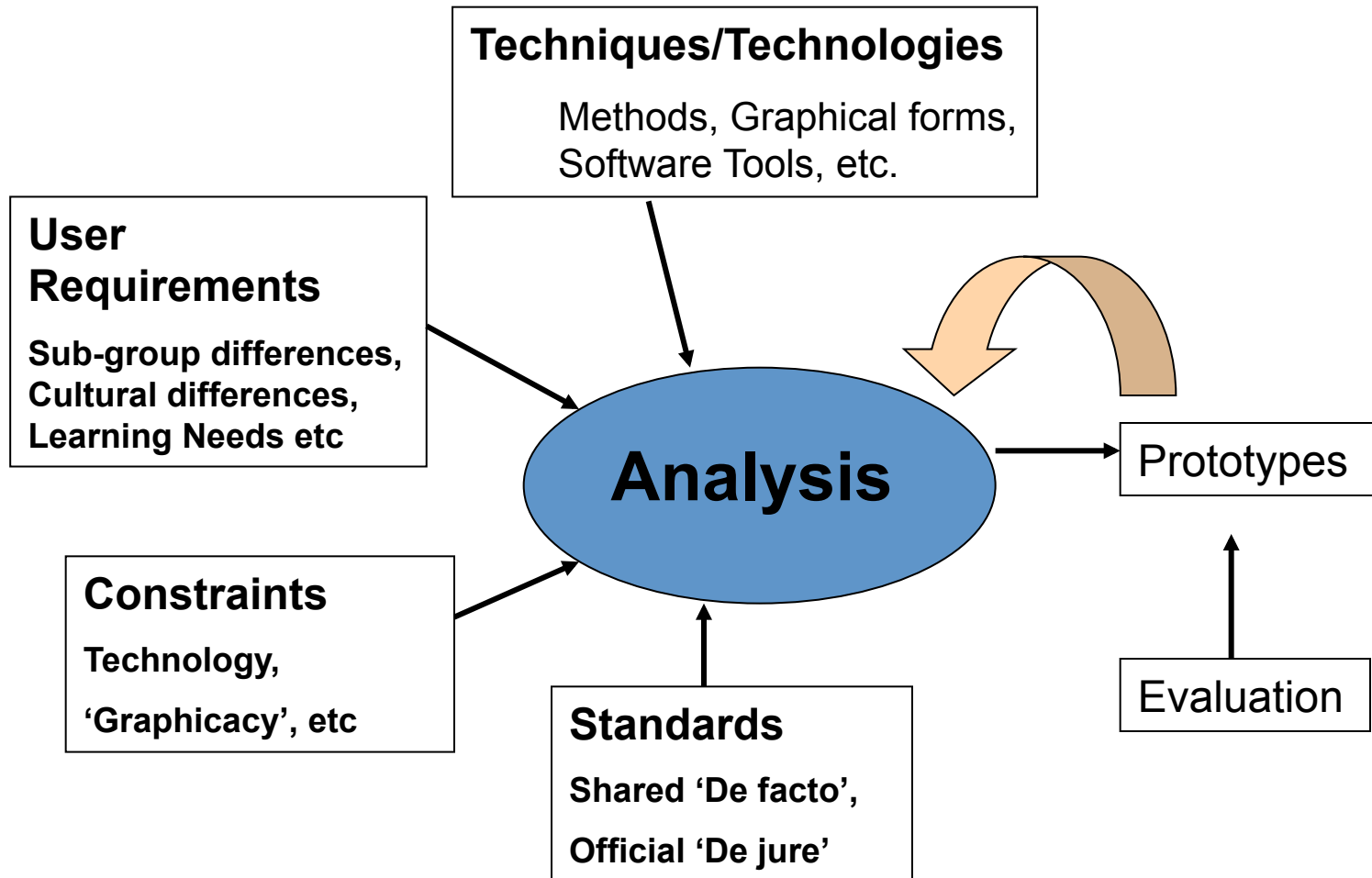


What needs to happen?

- Models should be understood in the context of the decision making process and be developed in response to the needs of **all** the identified users. Model interfacing is a key area.
- Issue of model visualisation within HTA needs to be taken more seriously as having an important role .
- Potential research areas:-
 - Evaluation of needs of users
 - Range of uses (eg Knowledge capture)

Development and assessment of Graphical tools in response to this analysis

Reference Model for R&D



Conclusions

- Visualisation tools can play an important role in enhancing understanding in HTA.
- There is an active and creative area of research which can build out of the existing research work in this area (scientific/data/information visualisation).
- Need for systematic approach to development of visualisation tools within HTA linked to a assessment of user needs and appreciation of standards.
- Visualisation is part of the solution not the whole solution.