Polling

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Step 1
Step 2
Step 3
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R YOU SERIOUSLY STILL USING EXCEL?

THE MANY ADVANTAGES OF OPEN SOURCE DECISION MODELLING IN EFFICIENT PROGRAMMING LANGUAGES
Speakers

> Jeroen Jansen PhD
  > The Innovation and Value Initiative
  > Precision Xtract / Precision Health Economics
  > Department of Health Policy & Research (Epidemiology), Stanford University School of Medicine

> Gianluca Baio PhD
  > Department of Statistical Science, University College London

> Howard Thom PhD
  > Bristol Medical School, Population Health Sciences, University of Bristol

> Devin Incerti PhD
  > The Innovation and Value Initiative
  > Precision Health Economics

Poll: What software do you mostly use for cost-effectiveness analysis?
Poll: Do you think R is better for cost-effectiveness analysis and modelling than Excel?

Why still Excel?

Jeroen P Jansen
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Common practice - 2-step approach

> Input parameter estimation (by means of evidence synthesis) with statistical software

> Forward simulation to calculate expected outcomes (e.g. QALYs, costs, NMBs, etc.) with economic model implemented in MS Excel

Parallel universes – parameter estimation & simulation modeling

**Clinical evaluation**
- Median PFS
- Median OS
- Hazard ratios
- 1-year survival
- 2-years survival
- Etc.

**Economic evaluation**
- Expected PFS
- Expected OS
- Expected QALYs
- Difference in QALYs
- Expected costs
- Differences in costs
Where does parameter estimation stop and (forward) simulation start? False dichotomy

Multi-parameter evidence synthesis

Complex models
Quantifying decision uncertainty as a function of parameter uncertainty and structural uncertainty

Transparency & reproducibility
Transparency & reproducibility
Transparency & reproducibility
Transparency & reproducibility

Where’s Waldo?
What do we mean by model transparency?

> Concept, math
> Face validity
> Implementation/programming
> …
> *Familiarity with software?*

> Open-source

**Alternative**

BCEA    HEEMOD    HESIM    …
R-based models are not only syntax

Value Tool  Advanced Model Interface

R-software package

R source code (GitHub)

https://innovationandvalueinitiative.shinyapps.io/ivi-ra-expert/

Time to change

![Comic strip illustrating the need to change spreadsheet models to better capture real-world complexity and avoid errors.](https://example.com/comicstrip.png)