

What Should Go Where: The Thin Line between Uncertainty Analysis and Model Validation

Moderator: Claire Rothery

***Speakers: Talitha Feenstra
Salah Ghabri
Isaac Corro Ramos***

Moderator



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Value of Information analysis

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Objectives for workshop

- Introduce the terminology and definitions used for model validation and uncertainty analysis
- Highlight and discuss the relationship between model validation and uncertainty analysis
- Discuss whether model validation efforts are ‘internal’ or ‘external’ to decision making
- Discuss when a model is considered valid enough? Criteria required to operationalize a level of validity
- Discuss the relative priority of different types of model validation in order of importance for decision making
- Discuss the relative emphasis placed on validation efforts vs. uncertainty analysis in HTA guidelines
- Review the validation efforts reported within published NICE Technology Appraisals and determine whether the validation efforts reported might have influenced NICE recommendations

“All models are wrong... some are useful”

George Box

Speakers



Talitha Feenstra
Groningen University
Faculty of Science and Engineering
Groningen Research Institute of
Pharmacy



Salah Ghabri
Haute Autorité de Santé | HAS
Department of Economic and
Public Health Evaluation



Isaac Corro Ramos
Institute for Medical Technology
Assessment
Erasmus University Rotterdam

Outline of workshop

Speaker 1: Talitha Feenstra	Related or Not: Terminology and definitions for model validation and uncertainty analysis
Speaker 2: Salah Ghabri	Existing good practice guidelines, focusing on operationalizing model validity, uncertainty analysis and their relationship
Speaker 3: Isaac Corro Ramos	Validation of health economic models and its impact on reimbursement decisions – does it make it a NICE case study?

Polling questions and Discussion topics

Poll Question: Question 4, Rank Order

4. How would you rank the different categories of validation in order of importance for decision making?
 - a. Operational validity (or external validation) that typically involves quantifying a model's discrimination and calibration performance in data that were not used to develop the model
 - b. Conceptual validity that typically involves assessing the extent to which a model and its assumptions correspond to clinical practice and evidence, as judged by experts and sufficient to support the decision problem
 - c. Input data validity that typically involves carefully checking all input data used and especially analyses performed on these data to estimate model parameters
 - d. Code verification that typically examines the extent to which the calculations are performed correctly and are consistent with the model's specification
 - e. Cross validation that typically involves comparing a model with others and determining the extent to which they produce similar results under similar assumptions

Poll Question: Question 5, Multiple Choice

5. What are the constraints to validate model outcomes with external data?
- a. Availability of real-world data (e.g. registries)
 - b. Lack of methods for operationalising validation techniques
 - c. Identifying suitable experts in the problem to assess face validity of evidence, model assumptions and results
 - d. Improving current HTA guidelines to be more explicit about the requirements, methods and techniques to use for validation
 - e. All empirical data available should be used in the initial model

Poll Question: Question 6, Multiple Choice

6. Is the distinction between model validation, uncertainty analysis and accuracy clear?
- a. Yes, no further guidance is required
 - b. No, more guidance is required to make the distinction clear
 - c. Unsure

Poll Question: Question 7, Multiple Choice

7. When operational validation tests show insufficient results, uncertainty analyses are not meaningful:
- a. Agree
 - b. Disagree
 - c. Unsure

Poll Question: Question 8, Multiple Choice

8. Researchers should set aside part of their empirical data for external validation purposes:
- a. Agree
 - b. Disagree
 - c. Unsure

Discussion topics

- When is a model considered valid enough?
- What validation issues should never be acceptable?
- How should we determine the required accuracy for model validation to inform decision making?
- Should HTA methods guidance be more specific about validation efforts? How?
- Is there a trade off between commercial agreements and validation status?

What Should Go Where:

Is there a thin line between uncertainty analysis and model validation?