A Description of the IVI-NSCLC Model v1.0 $\,$

Devin Incerti*

Jeroen P. Jansen*

November 9, 2018

Contents

1	Background				
	1.1	Open Source Value Project	3		
	1.2	Topic definition	3		
2	Purpose				
3 Components					
4	Mo	del structure	3		
	4.1	Disease model	3		
	4.2	Adverse events	3		
	4.3	Cost and utility	3		
	4.4	Patient heterogeneity	3		
	4.5	Rationale for individual-level simulation	3		
5	Model outcomes				
	5.1	Health outcomes	3		
	5.2	Risks	3		
	5.3	Costs	3		
	5.4	Value assessment	3		
6	Simulation and uncertainty analysis				
	6.1	Parameter uncertainty	3		
	6.2	Structural uncertainty	3		
	6.3	Implementation	3		

^{*}Innovation and Value Initiative

7	Source data and parameter estimation		
	7.1	Transition probabilities	4
	7.2	Adverse events	4
	7.3	Utilities	4
	7.4	Resource use, productivity, and cost	4
$\mathbf{A}_{]}$	ppen	dices	4
\mathbf{A}	Sys	tematic Literature Review	4
	A.1	Transition probabilities	4
	A.2	Adverse events	4
	A.3	Utilities	4
	A.4	Resource use, productivity, and costs	4
	A.5	Study identification	4
	A.6	Study selection	4
	A.7	Data collection	4
	A.8	Limitations	5
В	Net	work meta-analysis	5
	B.1	Population, interventions, and outcomes of interest	5
	B.2	Feasibility assessment	5
	В.3	Evaluation of consistency between direct and indirect comparisons	5
	B.4	Estimation of relative treatment effects under the assumption of consistency	5
	B.5	Models, likelihood, priors	5
	B.6	Model selection	5
	B.7	Software	5

List of Figures

List of Tables

1 Background

- 1.1 Open Source Value Project
- 1.2 Topic definition
- 2 Purpose
- 3 Components
- 4 Model structure
- 4.1 Disease model
- 4.2 Adverse events
- 4.3 Cost and utility
- 4.4 Patient heterogeneity
- 4.5 Rationale for individual-level simulation
- 5 Model outcomes
- 5.1 Health outcomes
- 5.2 Risks
- 5.3 Costs
- 5.4 Value assessment
- 6 Simulation and uncertainty analysis
- 6.1 Parameter uncertainty

Baio and Dawid (2015)

- 6.2 Structural uncertainty
- 6.3 Implementation

7 Source data and parameter estimation

Key parameters for the model relate to: (i) transition probabilities; (ii) adverse events; (iii) utilities; (iv) healthcare resource use; and (v) productivity. Parameter estimates are based on currently available published evidence identified by means of a systematic literature review (SLR) and synthesized with meta-analysis techniques where appropriate. Details of our SLR (Appendix A) and NMA (Appendix B) techniques are provided in the Appendix.

7.1 Transition probabilities

Protocol Section 7.4.2.5.1 to go here.

7.2 Adverse events

Since adverse events in nearly all clinical trials were reported as the number of patients experiencing the event, the NMA was performed on the proportion of patients experiencing the event of interest with a binomial likelihood and logit link (Dias et al. 2018, Chapter 2).

7.3 Utilities

To be added.

7.4 Resource use, productivity, and cost

To be added.

Appendices

A Systematic Literature Review

A.1 Transition probabilities

Protocol 7.4.1.1

A.2 Adverse events

To be added.

A.3 Utilities

Protocol 7.4.1.2

A.4 Resource use, productivity, and costs

Protocol 7.4.1.3

A.5 Study identification

Protocol 7.4.1.4

A.6 Study selection

Protocol 7.4.1.5

A.7 Data collection

Protocol 7.4.1.6

A.8 Limitations

Protocol 7.4.1.7

B Network meta-analysis

B.1 Population, interventions, and outcomes of interest

Protocol 7.4.2.1

B.2 Feasibility assessment

Protocol 7.4.2.2

B.3 Evaluation of consistency between direct and indirect comparisons

Protocol 7.4.2.3

B.4 Estimation of relative treatment effects under the assumption of consistency

Protocol 7.4.2.4

B.5 Models, likelihood, priors

Protocol 7.4.2.5 (but not Protocol 7.4.2.5.1 or 7.4.2.5.2)

B.6 Model selection

Protocol 7.4.2.6

B.7 Software

Protocol 7.4.2.7

References

Baio, G. and Dawid, A. P. (2015). Probabilistic sensitivity analysis in health economics. *Statistical methods in medical research*, 24(6):615–634.

Dias, S., Ades, A., Welton, N. J., Jansen, J. P., and Sutton, A. J. (2018). *Network meta-analysis for decision-making*. John Wiley & Sons.