Virtual Decision-Modelling Workshops for Creating the Future

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Decision Analysis Society
Society of Decision Professionals
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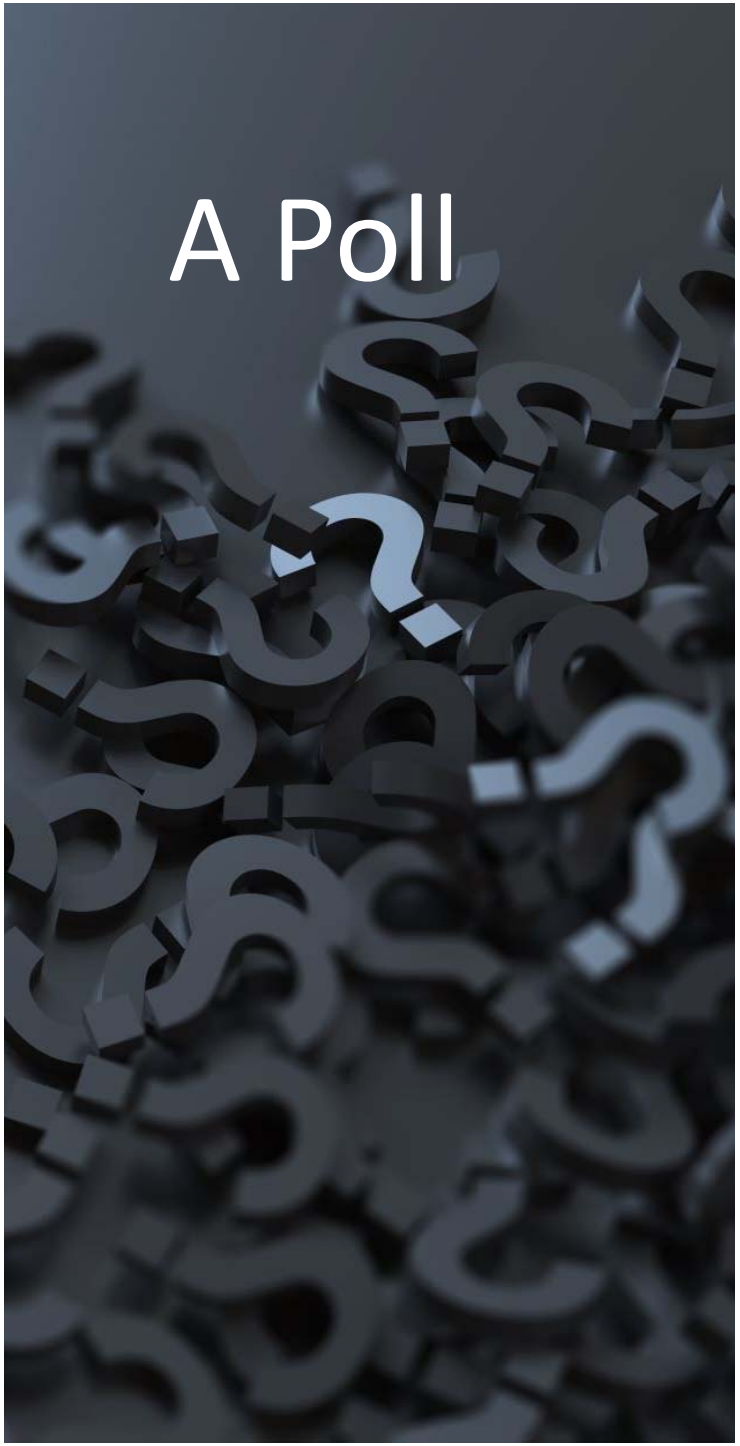
Purpose of this Webinar

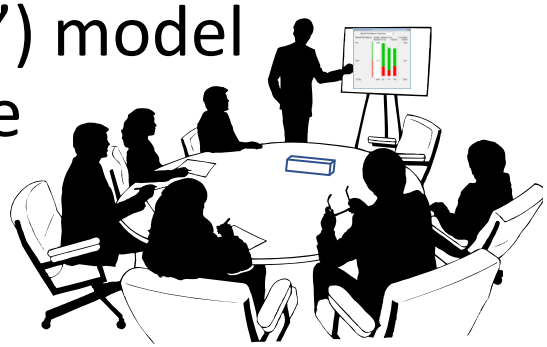
To describe how a group of experts can work collaboratively and virtually on contentious issues to create a decision-analytic model that will help individuals facing the issues in deciding what to do next.



Could you answer this question: *What is a decision conference?*

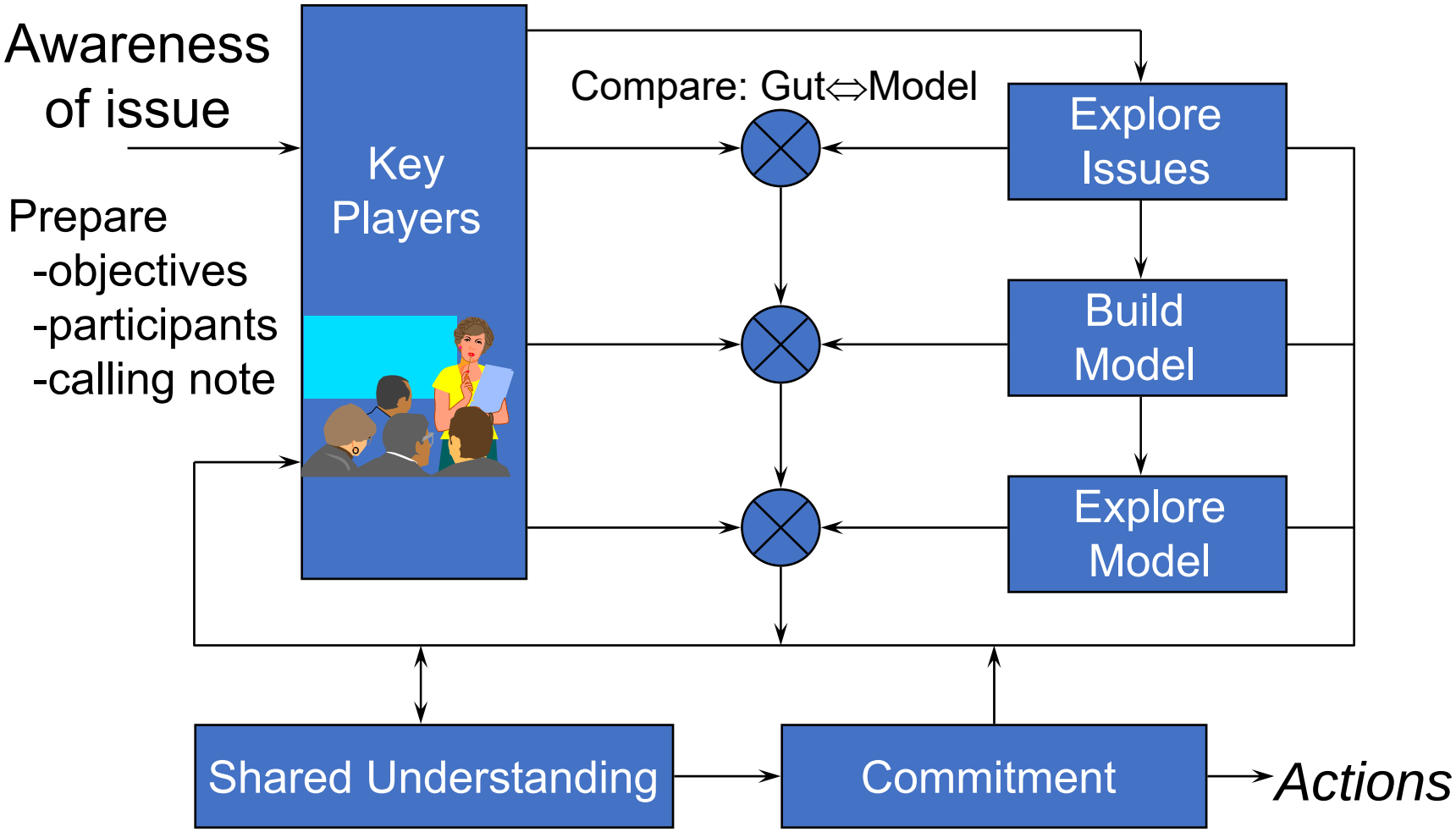
Decision Conferencing

- One or more facilitated workshops
- Attended by key players who represent the diversity of perspectives on the issues
- Facilitated by an impartial specialist in decision analysis who guides the process but doesn't contribute to the content of the discussion
- Creating a requisite ('good enough') model on-the-spot that provides structure to thinking and stimulates imagining alternative futures.



Ref: Phillips, L. D. (2007). Decision Conferencing. In W. Edwards & R. F. Miles & D. von Winterfeldt (Eds.), *Advances in Decision Analysis: From Foundations to Applications*. Cambridge: Cambridge University Press.

The Decision Conferencing Process

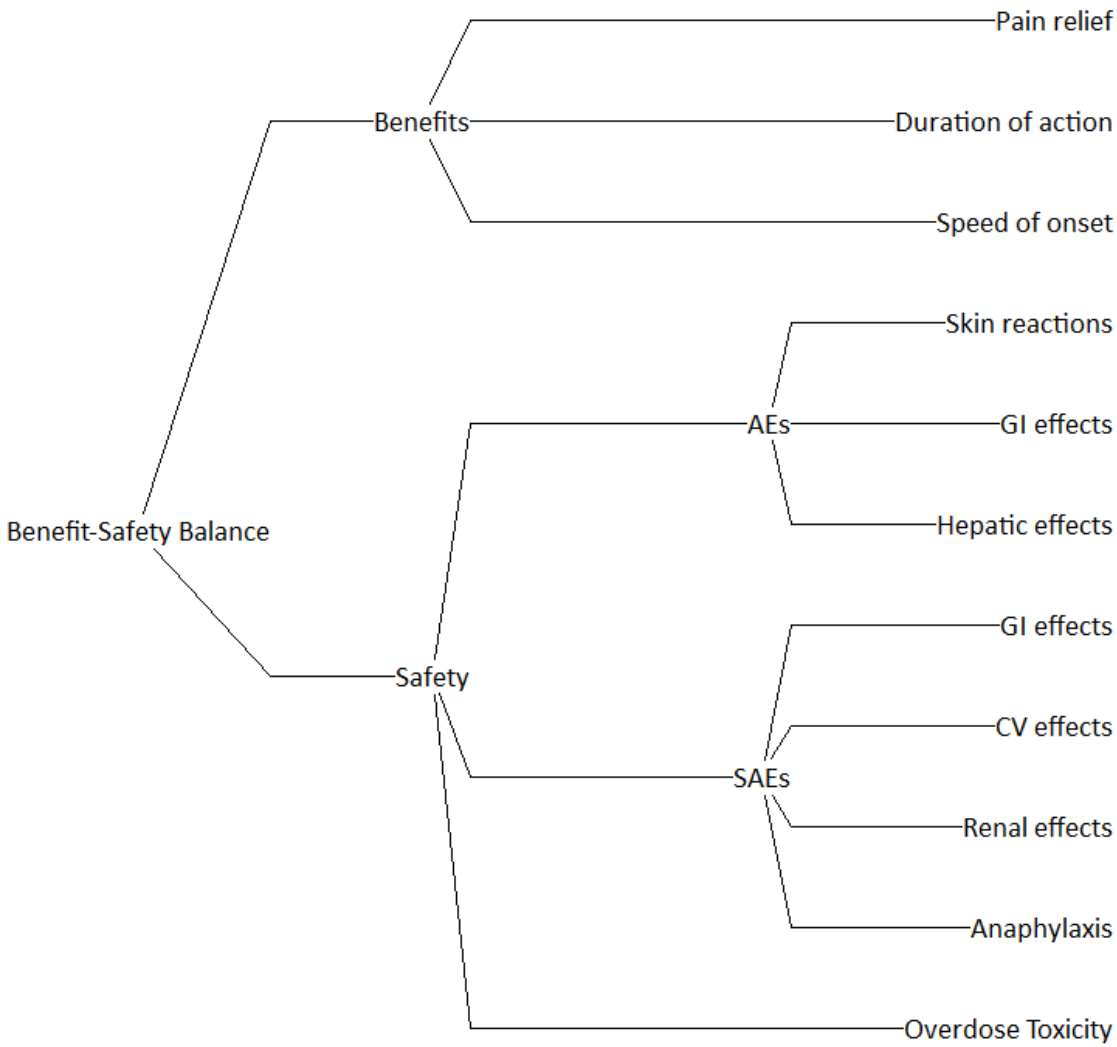


Case study: Pain-killer drugs

Ref: R. Moore et al., Use of multicriteria decision analysis (MCDA) for assessing the benefit and risk of over-the-counter analgesics. Journal of Pharmacy and Pharmacology 69, 1364-1373 (2017).

Reckitt Benkiser wanted to compare the pain-killer drug they manufacture, Neurofen (ibuprofen), with other analgesics that can be purchased over-the-counter.

Virtual DC1: Effects (value) Tree



1. Agree objectives: maximise benefits, minimise risks
2. Identify options.
3. Develop the benefit and safety criteria
4. Create operational definitions for the criteria

e.g., Pain relief: Proportion of patients suffering moderate to severe pain who individually report pain intensity reduction by 50% or more.

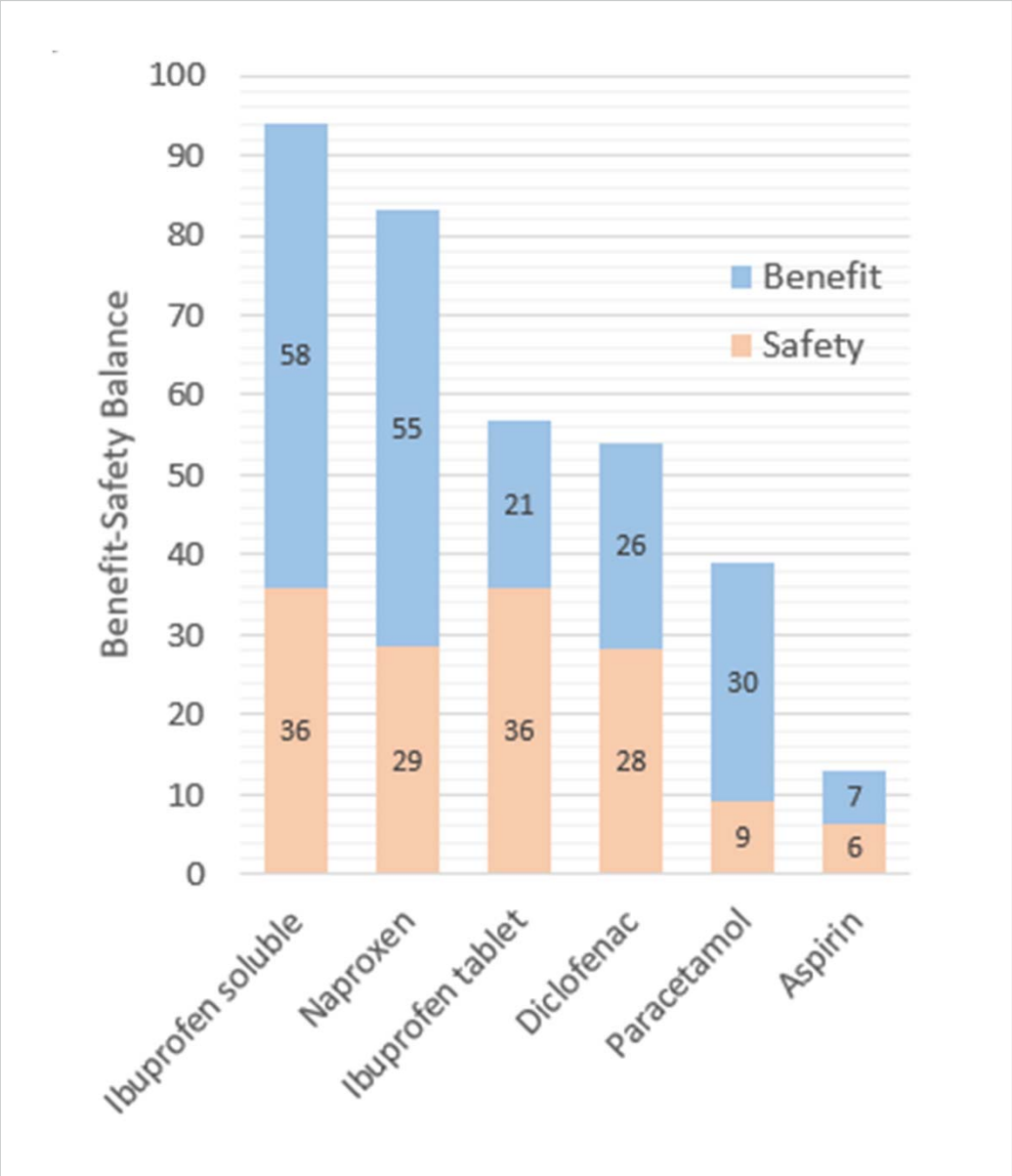
Virtual DC2: Effects (consequence) Table

	Effect names	Units	Ibuprofen soluble	Naproxen	Ibuprofen tablet	Diclofenac	Parace-tamol	Aspirin
Benefits	Pain relief	%	63	55	48	45	33	20
	Duration of action	hours	7.0	9.0	5.5	4.5	4.0	5.0
	Speed of onset	mins.	27	30	55	45	30	50
Adverse Effects	Skin reactions	No.	24	26	24	41	77	124
	GI effects	Pref.	100	100	100	100	90	0
	Hepatic effects	Pref.	100	50	100	100	0	30
Serious Adverse Effects	GI effects	Pref.	75	50	75	70	100	0
	CV effects	Pref.	75	80	75	0	75	100
	Renal effects	Pref.	100	0	100	100	100	100
	Anaphylaxis	Pref.	50	50	50	50	100	0
	Overdose Toxicity	Pref.	100	80	100	75	0	20

1. Find and agree data and metrics
2. Assess value functions for measurable data
3. Assess preference value scores when good data are lacking

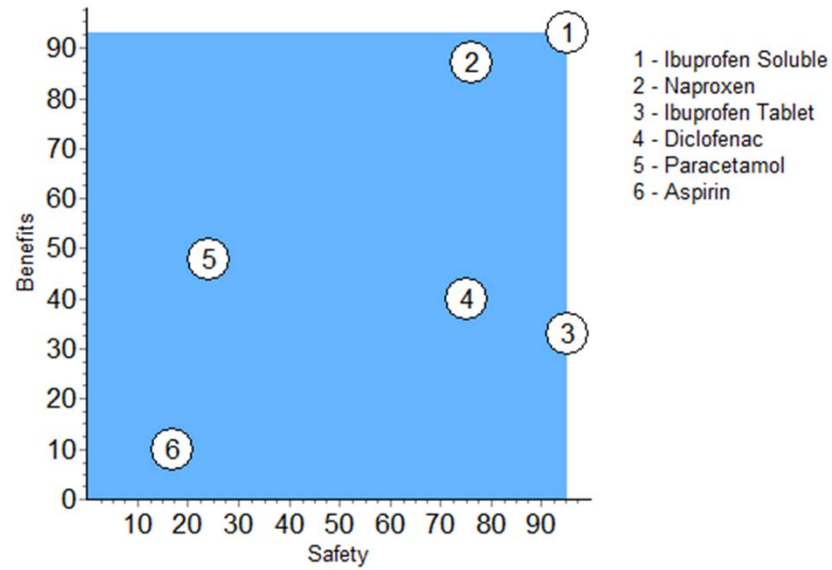
Virtual DC3: Assess weights & display results

1. Assess swing weights as appropriate for a hierarchical model (i.e., bottom-up, equating units of value, with consistency checks)
2. Apply expected value and weighted value equations
3. Construct bar graphs of results
4. Engage participants to see if they feel these results are about right

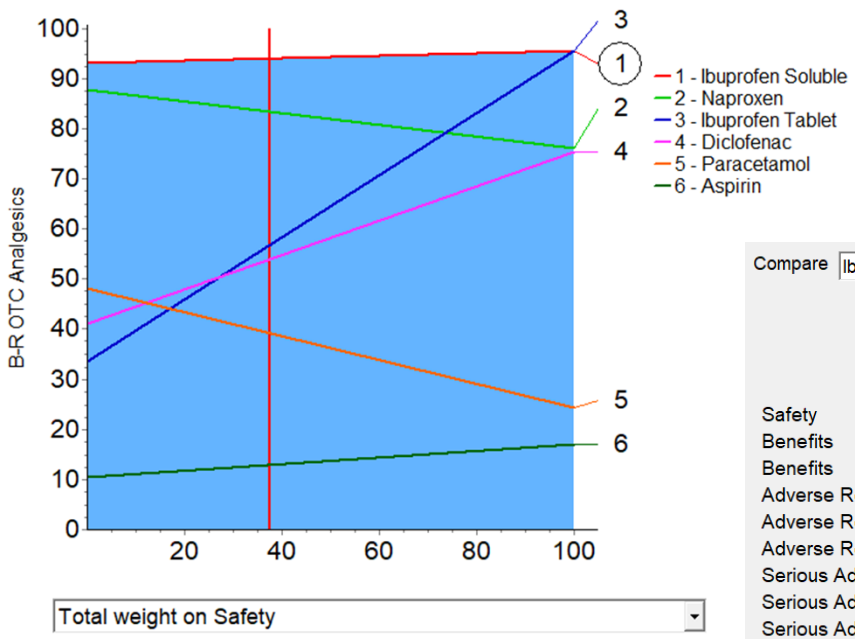


Virtual DC4: Explore model

Dominance analysis



Sensitivity analysis



Compare Ibuprofen Tablet minus Paracetamol

	Model Order	Cum Wt	Diff	Wtd Diff	Sum
Safety	Overdose Toxicity	27.2	100	27.2	27.2
Benefits	Pain relief	27.2	35	9.5	36.7
Benefits	Duration of action	10.9	30	3.3	39.9
Adverse Reactions	Hepatic effects	0.5	100	0.5	40.5
Adverse Reactions	Skin reactions	0.5	53	0.3	40.7
Adverse Reactions	GI effects	2.7	10	0.3	41.0
Serious Adverse Reac	CV effects	0.5	0	0.0	41.0
Serious Adverse Reac	Renal effects	0.3	0	0.0	41.0
Serious Adverse Reac	Anaphylaxis	0.3	-50	-0.1	40.9
Serious Adverse Reac	GI effects1	5.4	-25	-1.4	39.5
Benefits	Speed of onset	24.5	-89	-21.8	17.7
		100.0		17.7	

An orderly process is often the result of getting things right from the start!

Spend time with the client exploring the purpose of the modelling

Choose key players whose diversity and extent of expertise will contribute to the purpose

Ensure that all perspectives on the issues are represented by the key players

Now over to the experts!

Patrick Sharry

Paul Gordon

Edward Poot