IQWiG Institut für Qualität und Wirtschaftlichkeit im Gesundheitswesen
Institute for Quality and Efficiency in Health Care

Germany's efficiency frontier: An approach bridging needs-based and value-based principles in health care decision-making

Rotterdam, Nov. 11th, 2011

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The AMNOG Law

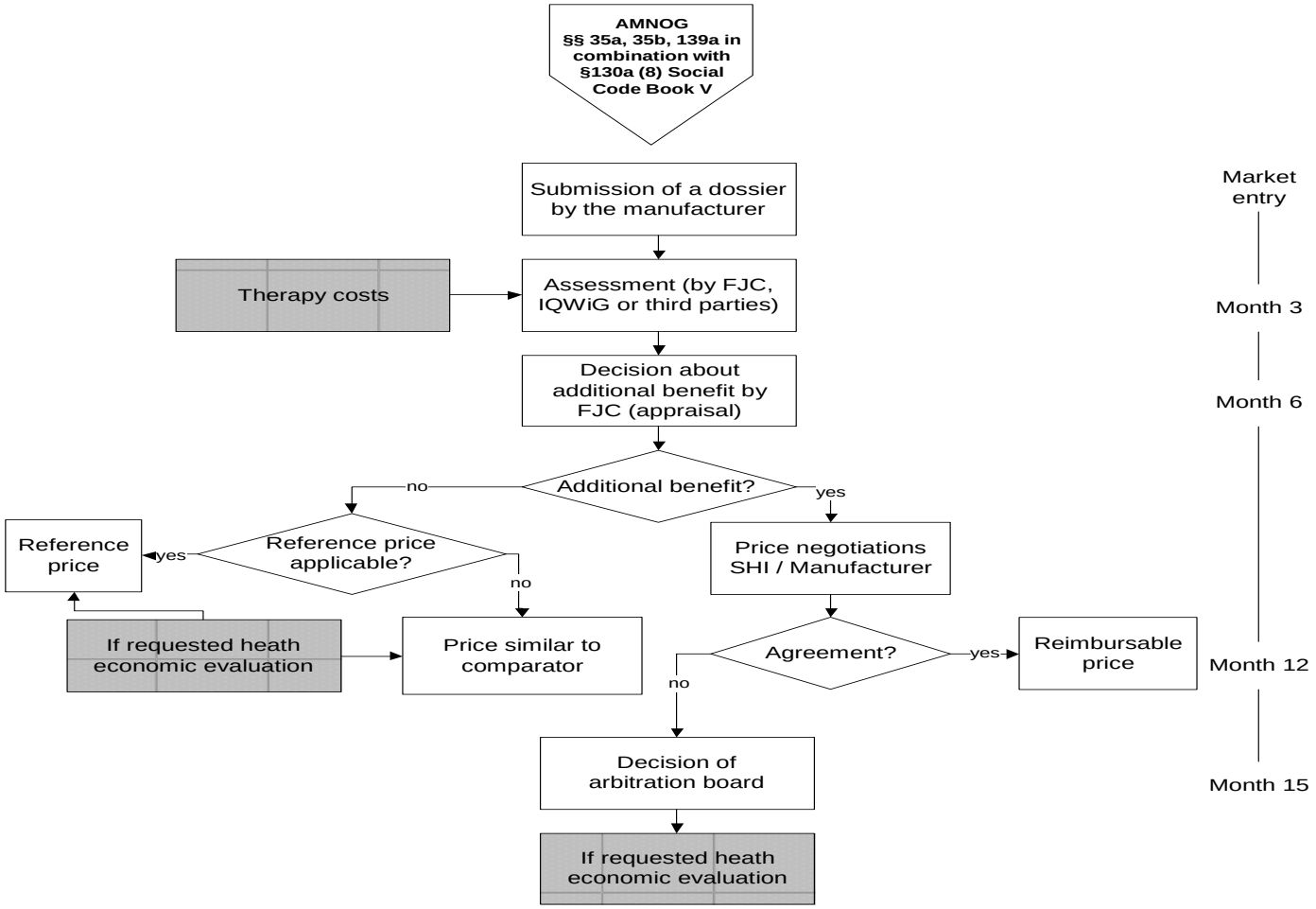

Figure 1: Timeline of the dossier assessment

Legend: Figure 1 illustrates the timeline of the dossier assessment according to the new bill in effect January 1st, 2011. Boxes shaded display where and how IQWiG comes in with regard to health economic criteria in the decision making process on drug prices in Germany.

Value dossier

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Module 1
- Administrative information
- Summary

Module 2
- General information on the drug
- Description of approved indication

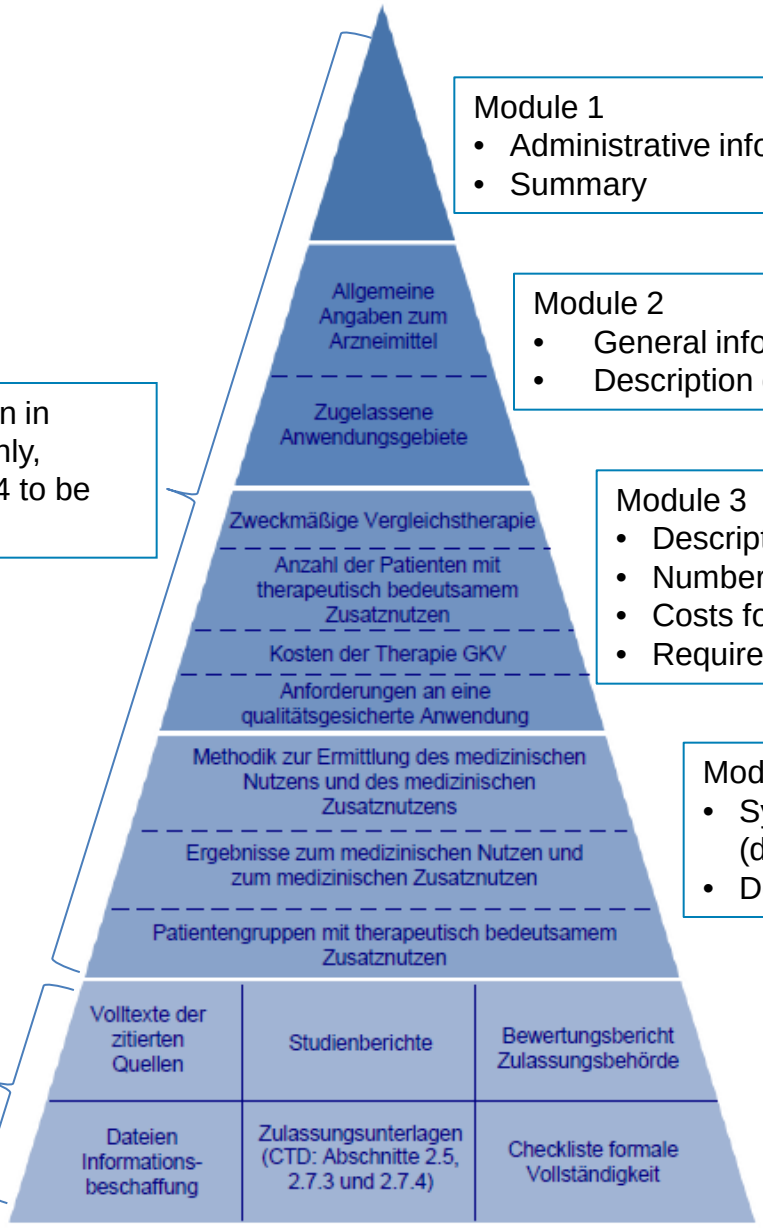
Module 3
- Description of appropriate comparator
- Number of patients with relevant additional benefit
- Costs for the SHI
- Requirements for quality-assured application

Module 4
- Systematic review of the benefit and additional benefit (description of methods and results)
- Description of patient groups with a relevant additional benefit

Module 5
- Full texts of references
- Data on the documentation of information retrieval
- Study reports for all manufacturer-sponsored trials
- Approval documents (CTD 2.5, 2.7.3, 2.7.4)
- Evaluation report of the regulatory authority
- Checklist for the review of formal completeness

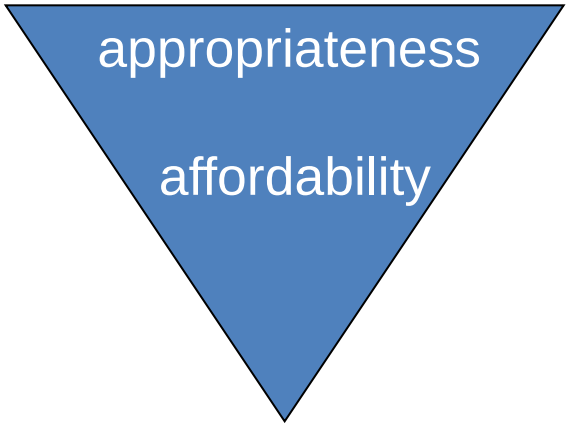
Submission in German only, Module 1-4 to be published

Submission in English possible, not to be published



What is the question for health economics to answer in the German system?

SHI as constituency of insurees paying contributions



Pharmaceutical manufacturer(s)

Persons that are in need of a specific therapy/ drug (legal entitlement)

The resulting question/problem

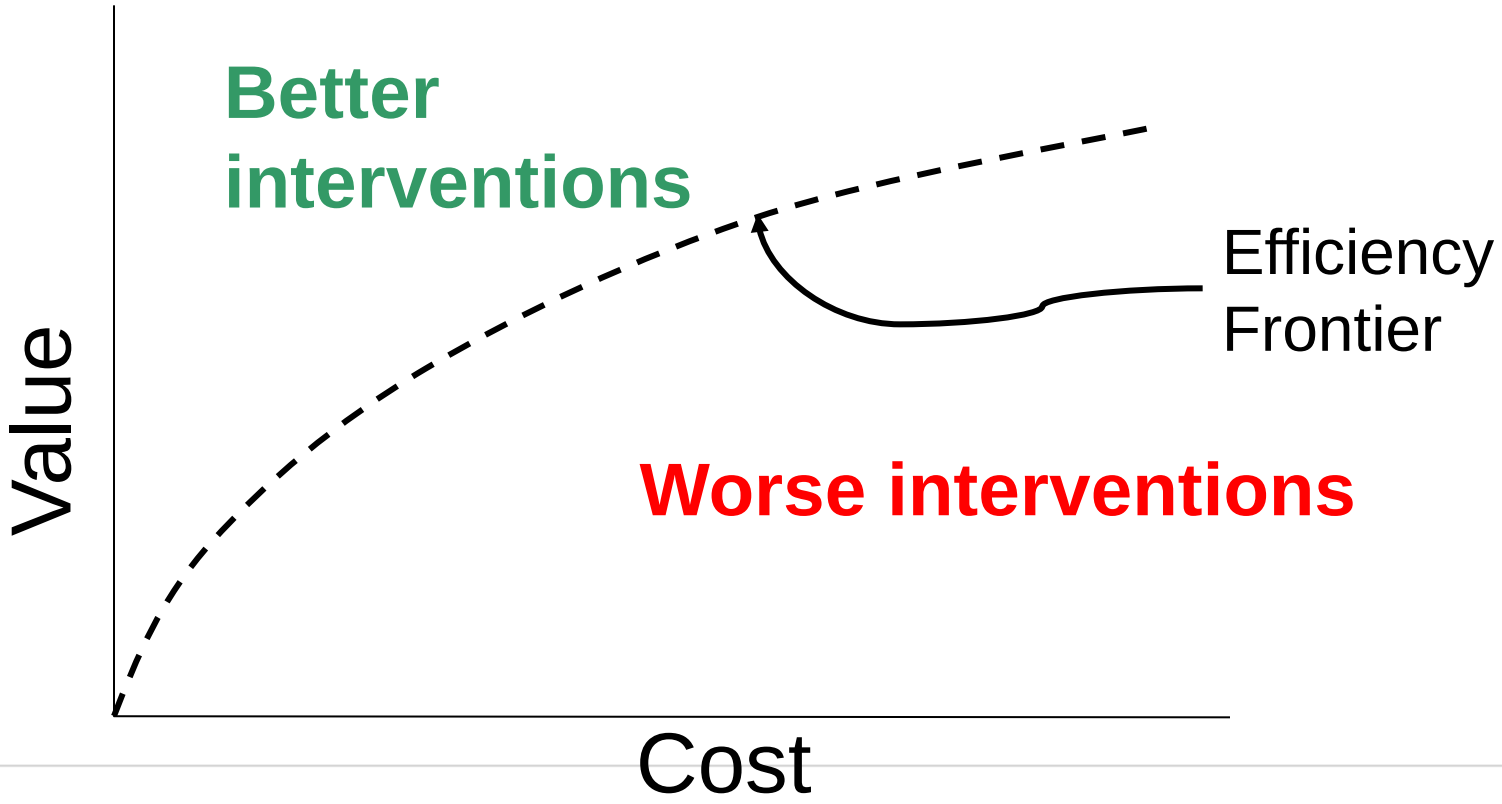
- How can you warrant medical treatment for people who depend on it,
- and finance it lest the paying insurees should be overburdened with increasing contributions
- while at the same time a pharmaceutical manufacturer should be reimbursed an appropriate maximum reimbursable price (on the basis of the market situation in that therapeutic field)?

  OR:
- Not whether we should not provide services beyond a certain ICER, but at what price are we going to offer them?

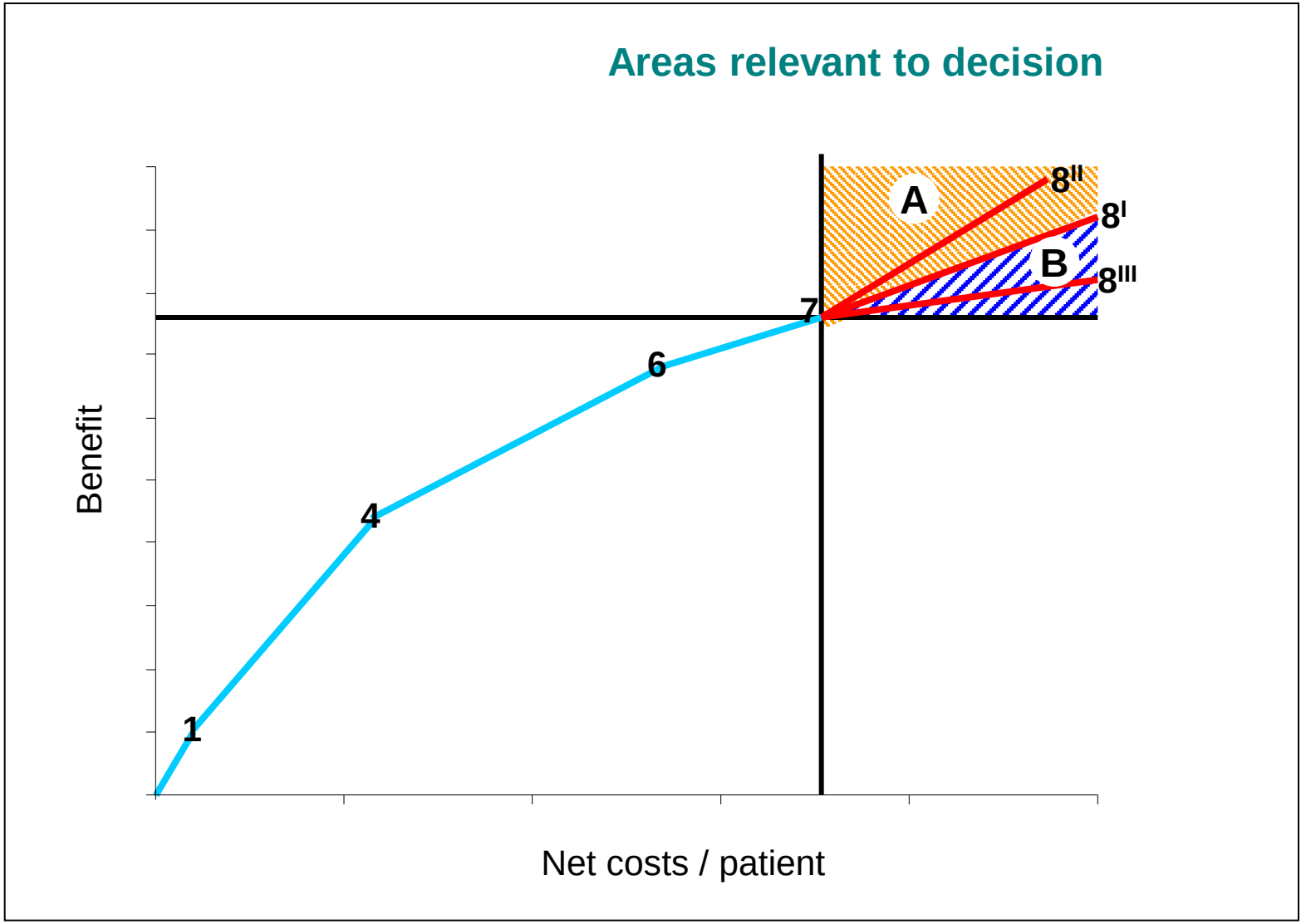
- Question/problem is not about allocation *per se across diseases*

Recommendations

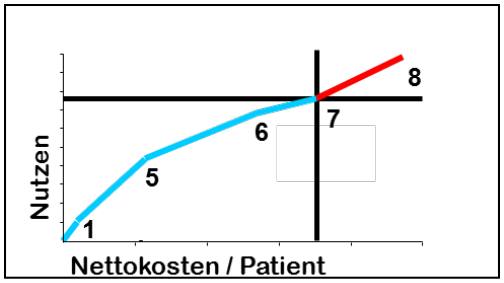
- ✓ An efficiency frontier should be constructed for each therapeutic area as the basis for economic evaluation of relevant health technologies
  - Reflects the “going rate” for benefits in a specific therapeutic area

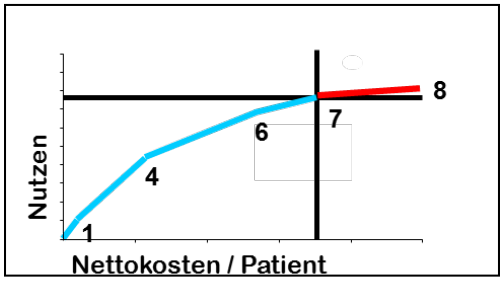


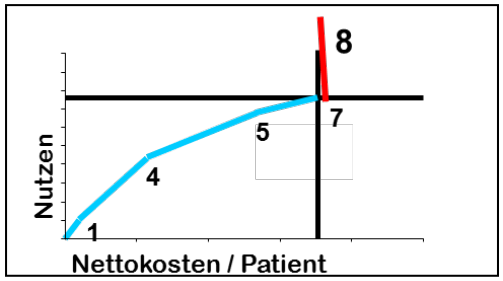
Efficiency Frontier



Rationale: Why weighting?







- Plot efficiency frontier for various patient-relevant outcomes on the basis of health economic evaluation
- Weighting of endpoint-specific efficiency frontierts to arrive at a reimbursable price
- Patients‘ preferences as a basis for the weighting process for they are experts in their specific disease area
- Elicitation of patients‘ preferences via
  - Analytic Hierarchy Process (AHP)
  - Conjoint Analyse (CA)

MCDA and AHP

- MCDA methods utilize a decision matrix to provide a systematic analytical approach for integrating risk levels, uncertainty, and valuation, which enables evaluation and ranking of many alternatives. (Belton & Steward, 2002)

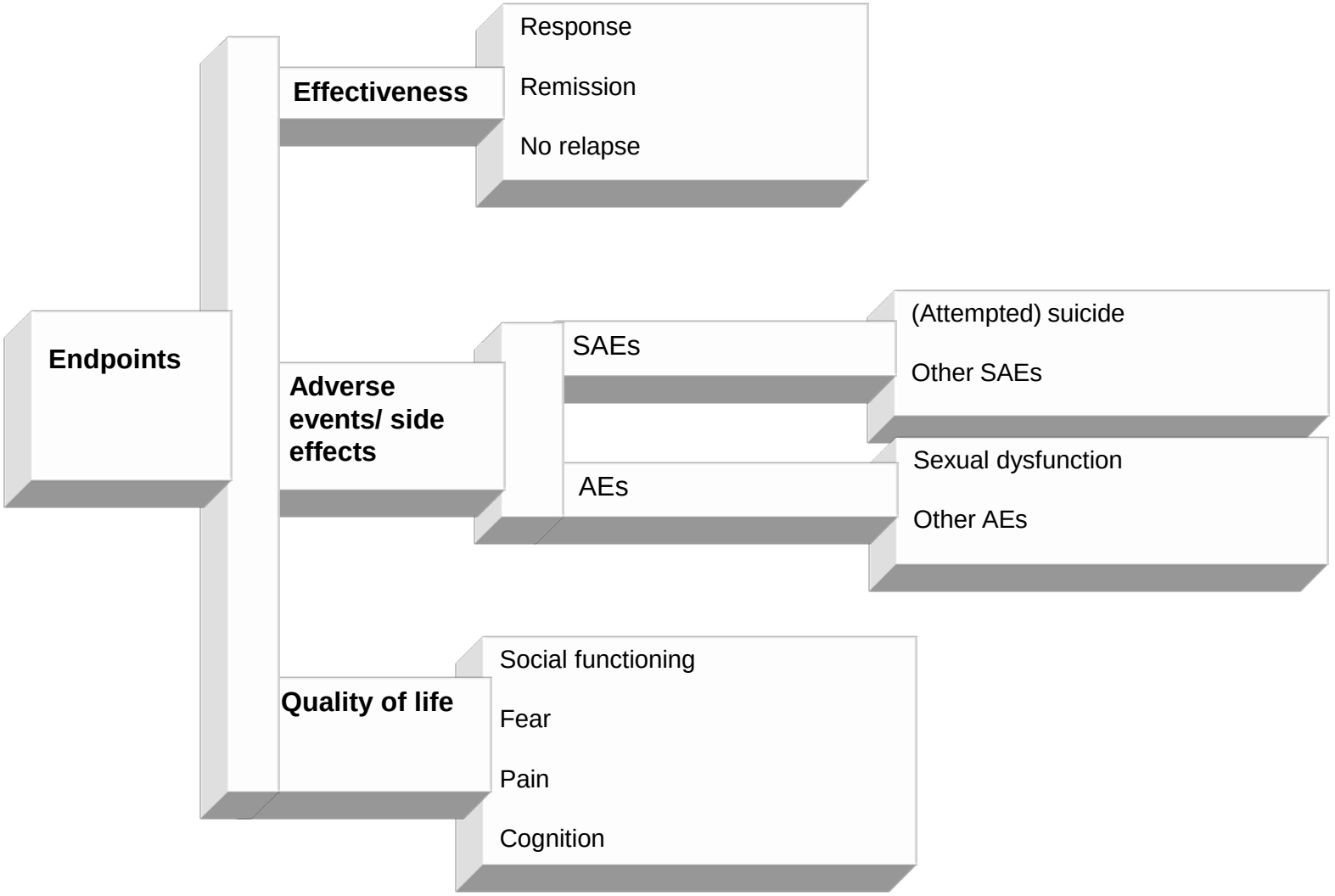
- The AHP structures a decision into a **hierarchy** of criteria, sub criteria and alternatives. By means of **pairwise comparisons** of two (sub) criteria or alternatives, it generates inconsistency ratios and weighting factors to prioritise the criteria and alternatives. (Saaty, 1989)

Example (paarwise comparison)

Which endpoint is more important and how much more important?

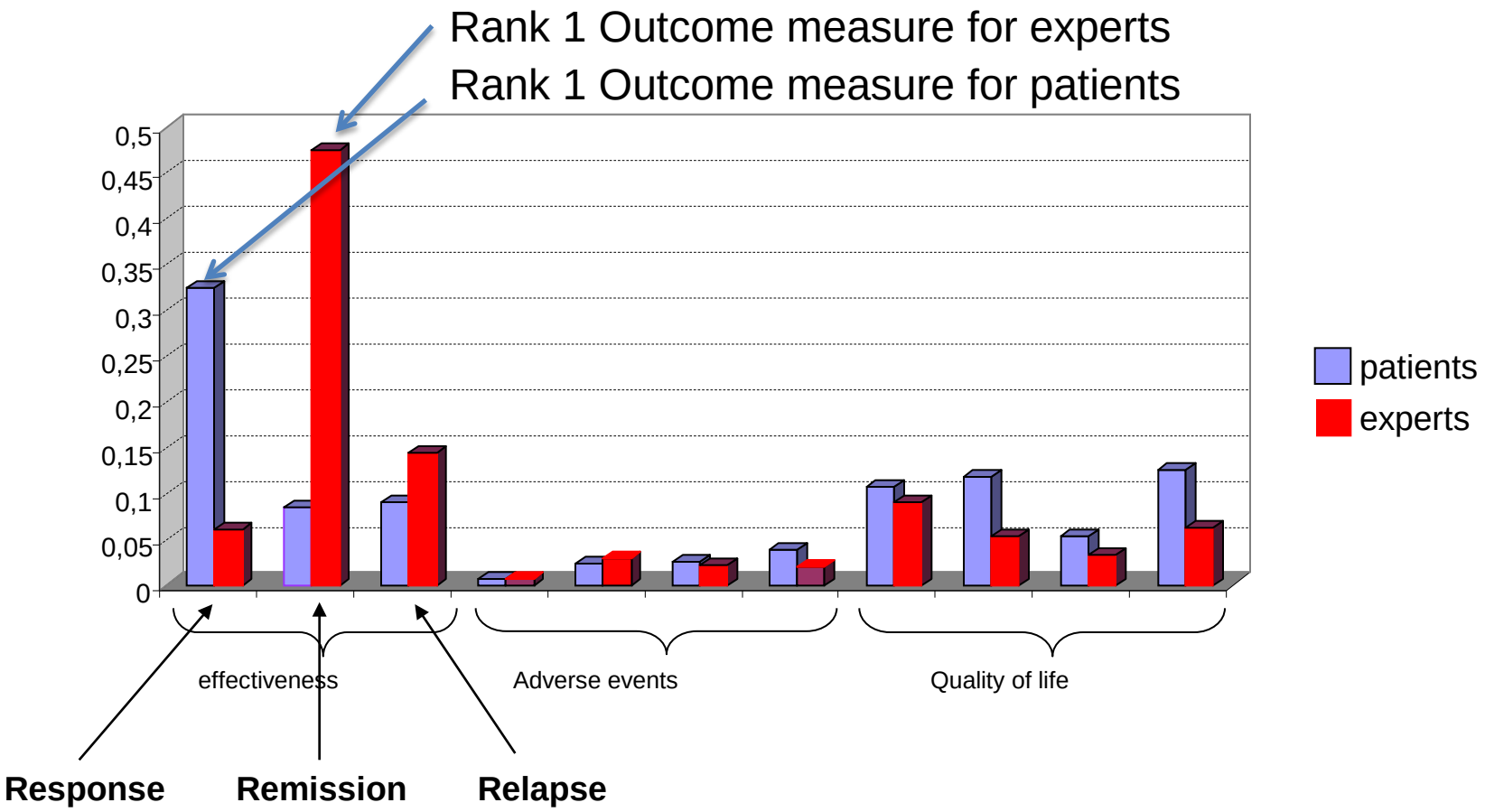
	Improvement in cognition									No adverse events							
Person 1	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
Person 2	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
Person 3	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9

Structure of hierarchy



Patient-relevant outcome measure	Group priority patients	C.R.	Group priority experts	C.R.
Efficacy	**,500**	0,10	**,681**	0,03
Response	,324		,061	
Remission	,085		,475	
No relapse	,091		,144	
All adverse events	**,095**	0,00	**,080**	0,00
Adverse events	**,031**	0,00	**,037**	0,00
Sexual function	,007		,007	
No other adverse events	,023		,029	
Serious adverse events	**,065**	0,00	**,043**	0,00
No suicide	,026		,022	
No other serious adverse events	,039		,020	
Accompanying effects on the quality of life	**,405**	0,02	**,240**	0,08
Social function	,107		,090	
No anxiety	,118		,054	
No pain	,054		,033	
Cognitive function	,125		,062	

Patients vs. experts

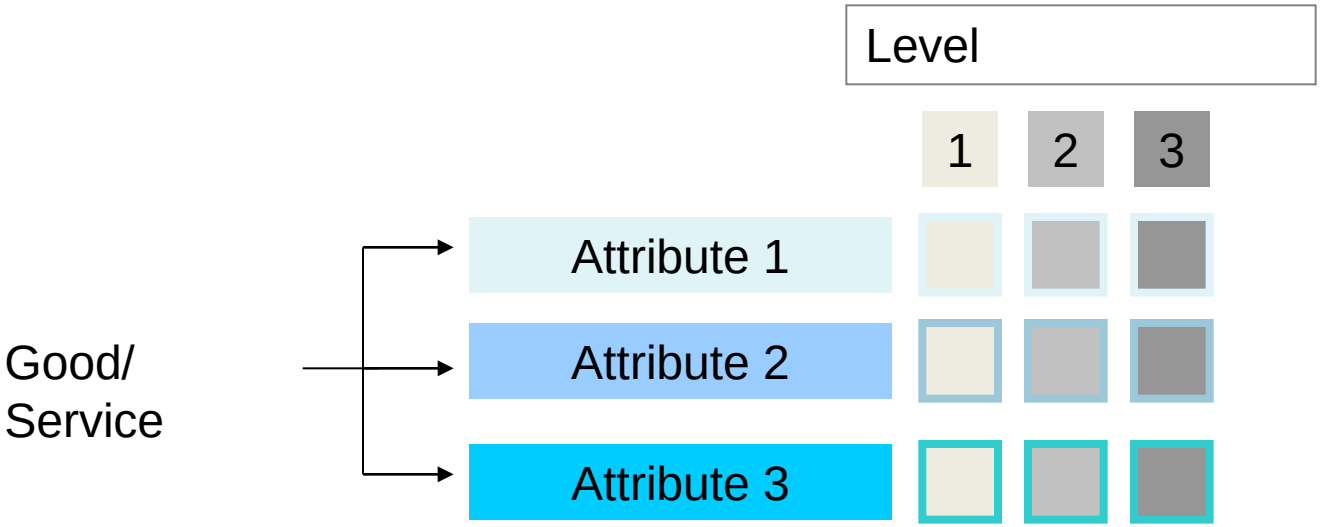


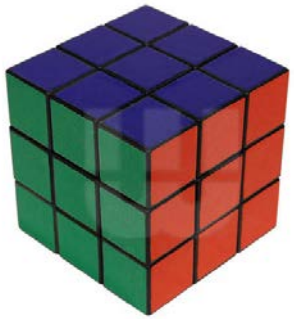
Conjoint Analysis (CA)

- A good or service can be described via its attributes that can be differentiated in levels.

  ➔decomposition

- Individual people appraise a good or a service by the attributes.





Conjoint Analyse (CA)

- Importance of attributes and levels
  - ➔ Pairwise comparison of scenarios that differ in levels of attributes
  - ➔ Discrete Choice

?

?

Data analysis

- Calculation of relative importance (Weighting) of an attribute via a logistic regression

$$V(A) = \alpha + \beta_1 X_1^A + \ldots + \beta_n X_n^A$$

$$V(B) = \alpha + \beta_1 X_1^B + \ldots + \beta_n X_n^B$$

$$\ln p(A)/p(B) = \beta_1 (X_1^A - X_1^B) + \ldots + \beta_n (X_n^A - X_n^B)$$

Weight of attribute (endpoint) is derived from the β-coefficient

Pilot specific simplified representation of the regression

$$V(A) =$$

$$\alpha + \beta_1 X^A_{DauerTherapie} + \beta_2 X^A_{Anwendungshäufigkeit} + \beta_3 X^A_{grippeähnSymp}$$

$$+\beta_4 X^A_{Magen-Darm-Beschwerden} + \beta_5 X^A_{psychischeSymptome} + \beta_6 X^A_{Haut\,/\,Haarprobleme} + \beta_7 X^A_{SVR}$$

Example Choice Set

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	Therapie A	**Therapie B**
duration of treatment	24 weeks	48 weeks
frequence of injecting interferon	Once in 2 weeks time	1 times a week
duration of flue like symptoms after injection	tree days after injection	one day after injection
probability of getting gastrointestinal symptoms	25 out of 100 people (25%)	45 out of 100 people (45%)
probability of getting phychiatric symptoms	55 out of 100 people (55%)	45 out of 100 people (45%)
probability of getting skin problems or Alopecia	55 out of 100 people (55%)	45 out of 100 people (45%)
probability of sustained virological response 6 month after treatment	55 out of 100 people (55%)	45 out of 100 people (45%)
Please choose A or B	□	□

Identification: Patients

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Attribut	coeff	Odds Ratio	se coeff	Sig	95% CI low	95% CI up	95% CI breite oneway	rel. Gew. in %
(1) duration of treatment	0,2503	1,284282	0,02342	< 0.001	0,2044	0,2962	0,0459	13
(2) frequency of injecting interferon	0,2966	1,345277	0,02337	< 0.001	0,2508	0,3424	0,0456	16
(3) duration of flue like symptoms after injection	0,1052	1,110933	0,02323	< 0.001	0,0597	0,1507	0,0452	6
(4) probability of getting gastrointestinal symptoms	0,1233	1,131224	0,02332	< 0.001	0,0776	0,169	0,0453	7
(5) probability of getting psychiatric symptoms	0,1857	1,204061	0,02342	< 0.001	0,1398	0,2317	0,0459	10
(6) probability of getting skin problems or Alopecia	0,1055	1,111155	0,02627	< 0.001	0,0599	0,1511	0,0455	6
(7) probability of sustained virological response 6 month after treatment	0,8041	2,234684	0,02611	< 0.001	0,7529	0,8553	0,05115	43
Likelihood -ratio test of rho=0: chibar2(01) = 14.12 Prob >= chibar2 = 0.000, Random-effects logistic regression, Number of obs = 5252, Log likelihood = -2852.7476, Prob > chi2 = 0.0000								

Identification: Experts

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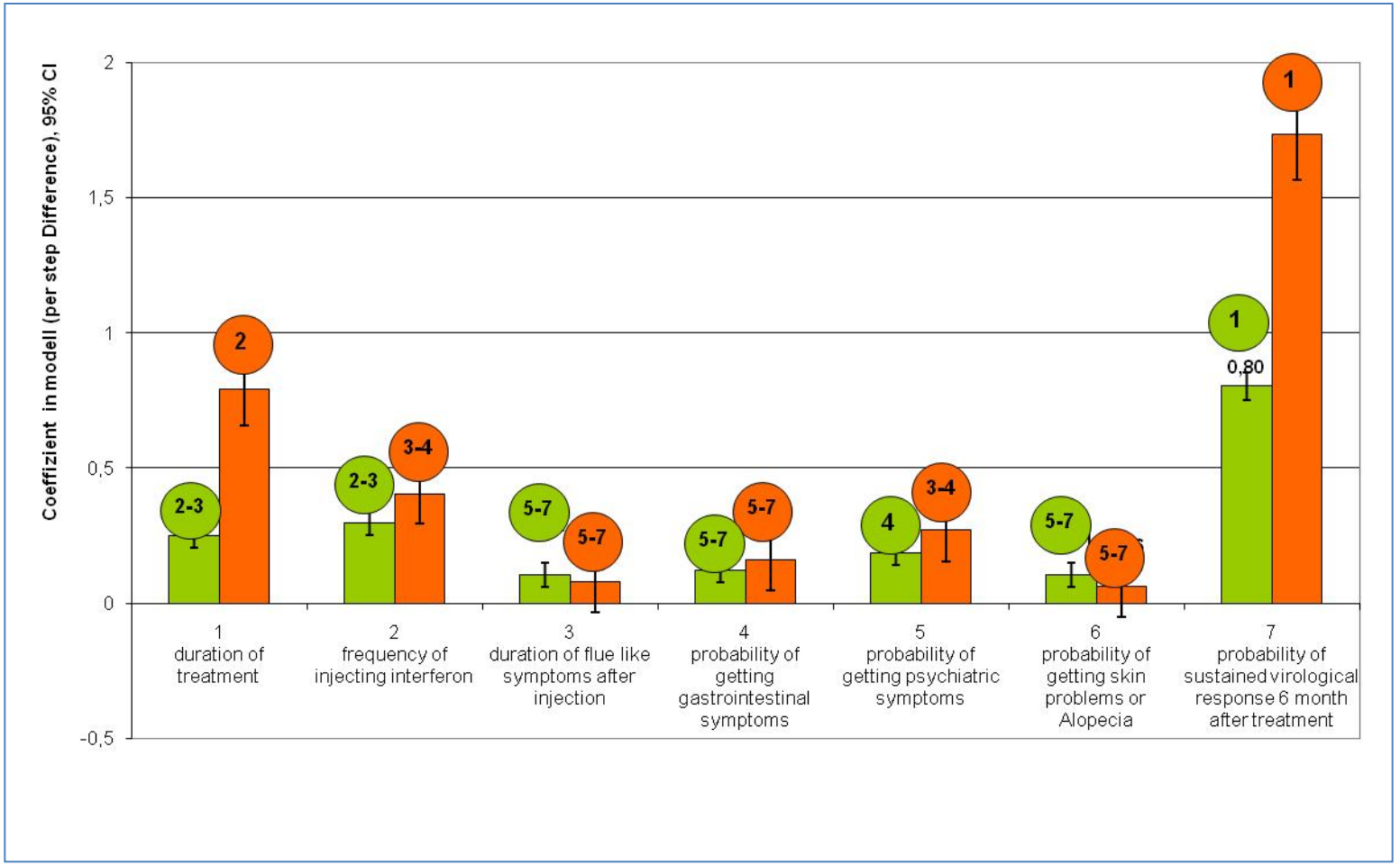
Attribut	Coeff	Odds ratio	se coeff	sig	95% CI low	95% CI up	95% CI breite oneway	rel. Gew. in %
(1) duration of treatment	0,7918	2,207451	0,069329	< 0.001	0,6560	0,9277	0,1358817	23
(2) frequency of injecting interferon	0,4053	1,499740	0,056374	0,0000	0,2948	0,5158	0,1104905	12
(3) duration of flue like symptoms after injection	0,0786	1,081725	0,056094	0,1610	-0,0314	0,1885	0,1099418	2
(4) probability of getting gastrointestinal symptoms	0,1620	1,175813	0,058546	< 0.01	0,0472	0,2767	0,1147476	5
(5) probability of getting psychiatric symptoms	0,2702	1,310261	0,059416	< 0.001	0,1538	0,3867	0,1164531	8
(6) probability of getting skin problems or Alopecia	0,0622	1,064199	0,058534	0,2880	-0,0525	0,1769	0,1147253	2
(7) probability of sustained virological response 6 month after treatment	1,7362	5,675621	0,086153	< 0.001	1,5673	1,9050	0,168857	50

Likelihood-ratio test of rho=0: chibar2(01) = 0.00, Prob >= chibar2 = 1.000, Random-effects logistic regression, Number of obs = 1512, LR chi2(7) = 1076.62, Log likelihood = -509.20122, Prob > chi2 = 0.000

Patients vs. experts



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