



The Measurement of Health-Related Quality of Life (HRQoL) First German Findings from the Multi-Instrument Comparison (MIC) Study

**Michael Schlander, Munir A. Khan, Angelo Iezzi,
Aimee Maxwell, Oliver Schwarz, Jeff Richardson**

16th ISPOR Annual European Congress
Dublin / Ireland, November 04, 2013



“Generic” Multi-Attribute Utility Instruments for the Measurement of HRQoL:

Are they all the same?

- Coverage of descriptive system
- Sensitivity of dimensions
- Model used to combine the dimensions / items
- Valuation method
(scaling instrument [VAS, SG, TTO, ...])



HRQoL:

Comparison of Generic Index Instruments

RS, Rating Scale (Visual Analogue Scale, VAS); SG, Standard Gamble; TTO, Time-Trade Off

Instrument	15D	AQoL8D	EQ-5D	HUI-3	QWB	SF12 (SF-6D)
Scaling	RS	TTO	TTO	SG	RS	SG
Dimensions	15	8	5	8	5	2
Levels	4-5	4	3	5-6	2-3	4-6
No. of Health States	31bn	16.8m	243	972.000	945	7.500



Primary MIC Study Objectives

Generic HRQoL Index Instruments

- EQ-5D-5L; SF-6D, HUI-3, 15D, QWB¹, AQoL-4D/-8D
- Summary Statistics and Internal Reliability
- Assessing the Convergence and Predictive Consistency
 - Intraclass Correlations with Other Instruments
- Exploring the Sensitivity of Instruments
 - to Summary Physical and Psychosocial Dimensions
 - to SF-36 Dimensions
 - Pairwise Comparisons of Sensitivity

¹QWB not included in German analysis;



MIC Study: Countries and Chief Investigators

→ **Australia:**

Jeff Richardson (Monash University, Australia)

Robert Cummins (Deakin University, Australia)

→ **Canada / United States of America:**

Robert Kaplan (University of California Los Angeles, USA)

→ **Germany:**

Michael Schlander (University of Heidelberg, Germany)

→ **Norway:**

Jan Abel Olsen (University of Tromsø, Norway)

→ **United Kingdom:**

Joanna Coast (University of Birmingham, England)

The MIC Study was funded by an Australian **National Health and Medical Research Council (NHMRC)** project grant (ID 1006334); the German arm was further supported by the German Cancer Research Center (Heidelberg / Germany) and conducted with the Institute for Innovation & Valuation in Health Care (Wiesbaden / Germany); the Norwegian arm was facilitated by a grant from the University of Tromsø.

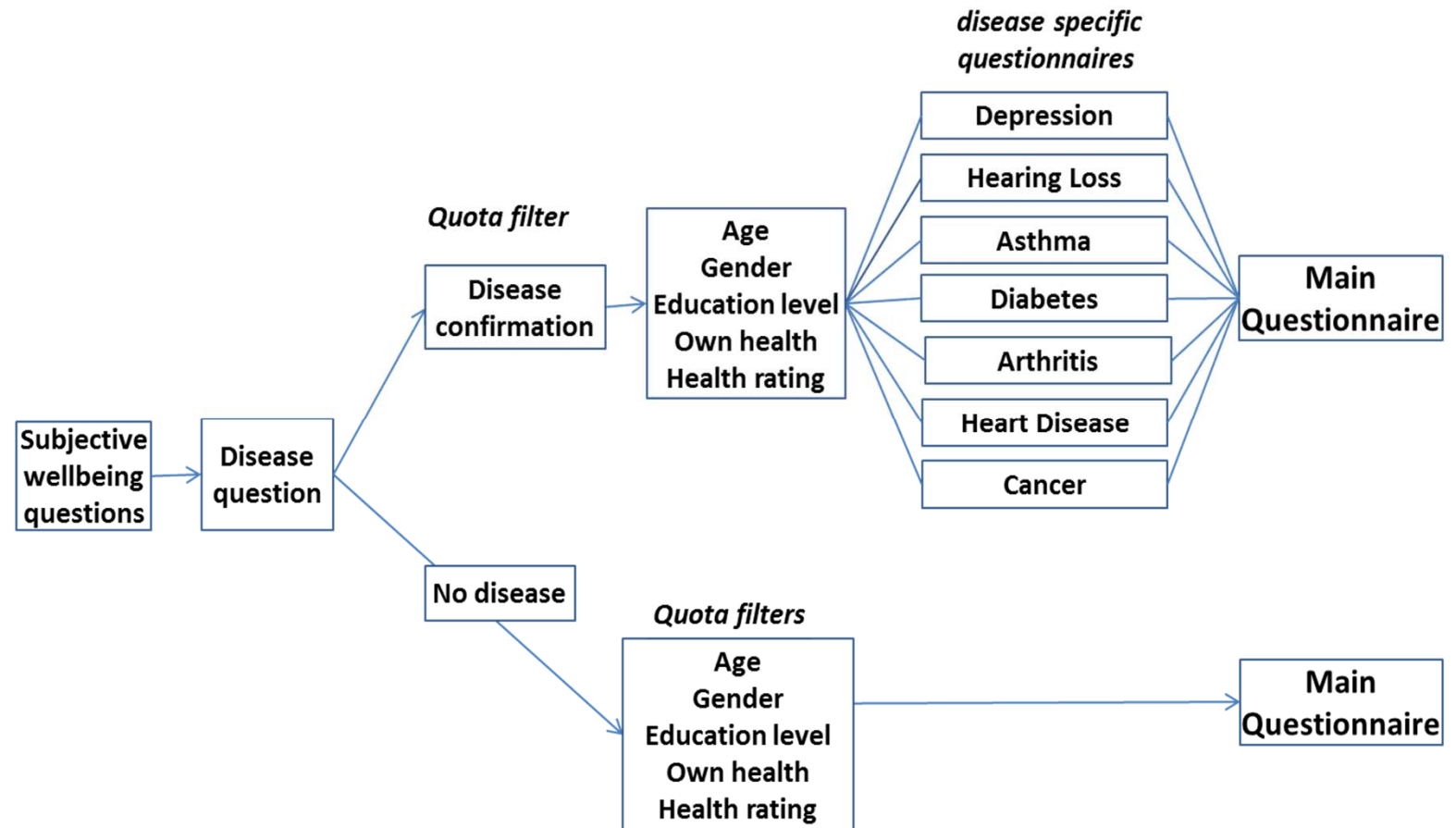


MIC Study: Respondents

- Australia, Canada, **Germany**, Norway, UK, USA
 - net sample size: **N=8,022**; hereof, Germany (D), **n=1,269**
- Samples of the healthy public (net, N=1,760; hereof D, **n=260**)
 - representative in terms of age group, gender, education
- Patient samples (N=6,262; hereof D, **n=1,009**):
 - no quota; resulting sample highly skewed with respect to age
 - asthma (N=856; D, **n=147**)
 - cancer (N=772; D, **n=115**)
 - depression (N=917; D, **n=160**)
 - diabetes (N=924; =D, **n=140**)
 - hearing problems (N= 852; D, **n=136**)
 - arthritis (N=929; D, **n=159**)
 - chronic heart disease (N= 943; D, **n=152**)



MIC Study: Questionnaire Administration





MIC Study: Summary Statistics

Distribution of total German sample by age and gender:

Disease	Distribution of diseases by age group and gender												Total		
	18-24		25-34		35-44		45-54		55-64		65+				
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	T
Asthma	10	10	7	14	28	20	15	17	8	9	7	2	75	72	147
Cancer	0	0	3	7	11	9	9	19	16	10	24	7	63	52	115
Depression	4	12	10	20	16	26	21	28	11	9	1	2	63	97	160
Diabetes	3	3	4	4	8	6	32	15	21	16	21	7	89	51	140
Hearing problems	3	3	1	5	12	10	28	23	21	13	17	0	82	54	136
Arthritis	0	0	2	4	11	8	33	44	20	22	9	6	75	84	159
Heart problems	2	3	2	2	9	3	19	17	45	23	23	4	100	52	152
No disease- Healthy public	6	11	22	30	24	24	28	33	25	20	26	11	131	129	260
Total	28	42	51	86	119	106	185	196	167	122	128	39	678	591	1269



MIC Study: Internal Reliability

Reliability of instruments

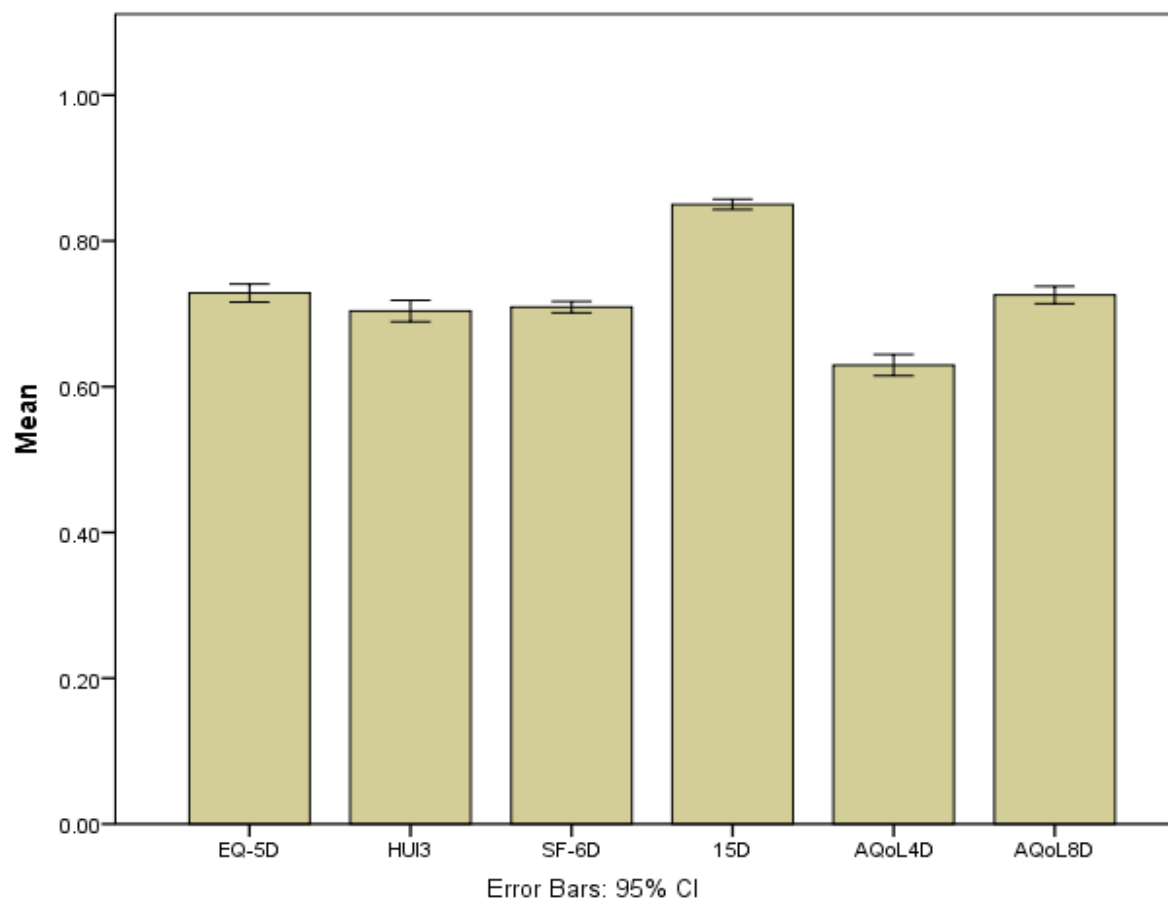
(tests carried out with public data,
using Cronbach's alpha):

Instrument	No of items	Cronbach's Alpha
AQoL-4D	12	0.82
AQoL-8D	35	0.96
HUI3	8	0.74
EQ-5D	5	0.82
15D	15	0.88
ICECAP	5	0.84
SF-36	36	0.68*
IHS	4	0.47*
SWLS	5	0.92



MIC Study: Summary Statistics

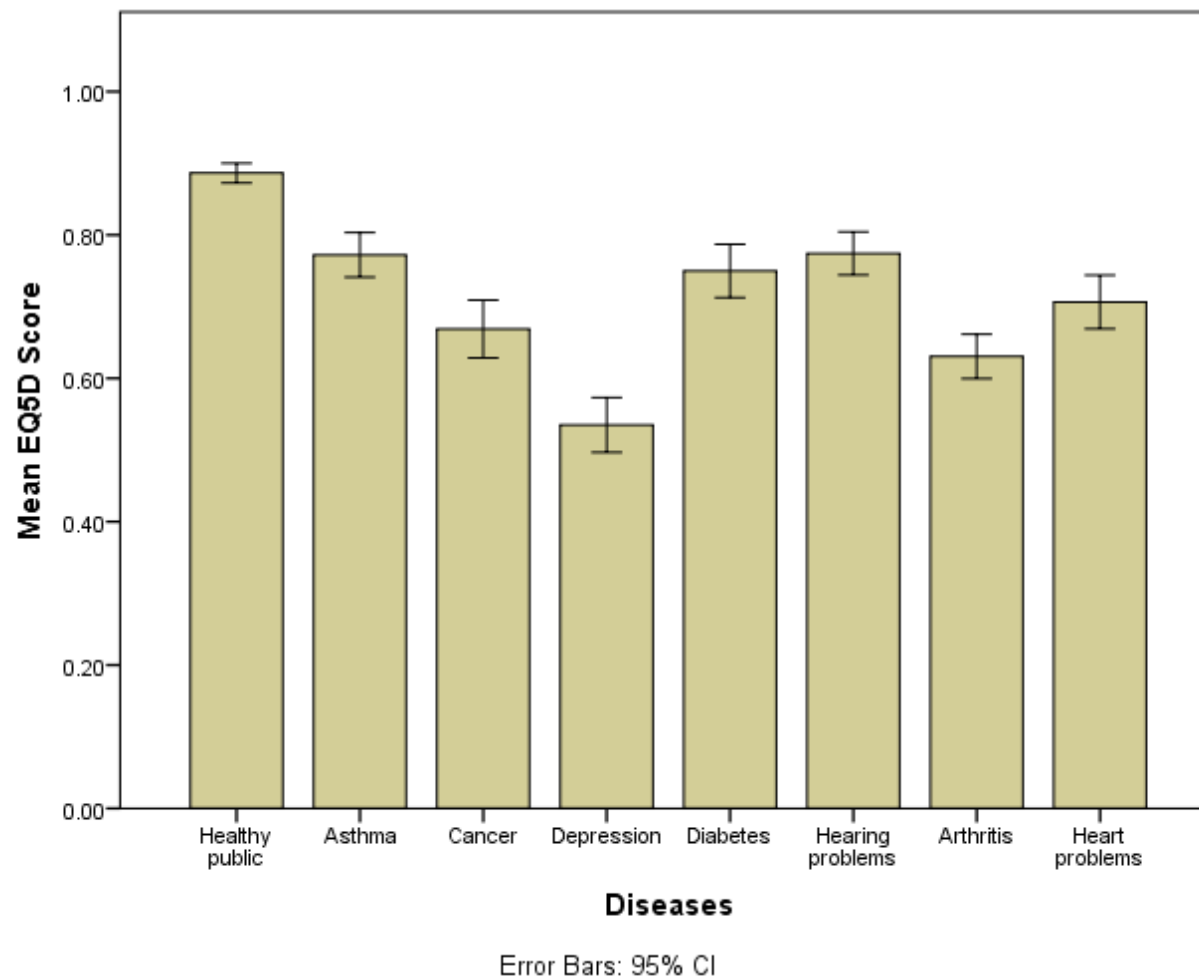
Mean values by instrument (total n=1,269):





MIC Study: Summary Statistics

Mean EQ-5D values by disease group (total n=1,269):





MIC Study: Correlations

Pearson correlation between MAU Instruments (public sample, n=260):

	EQ-5D	HUI3	SF-6D	15D	AQoL-4D	AQoL-8D
EQ-5D	1	.649**	.595**	.654**	.530**	.514**
HUI3	.649**	1	.515**	.649**	.540**	.522**
SF-6D	.595**	.515**	1	.569**	.450**	.648**
15D	.654**	.649**	.569**	1	.558**	.597**
AQoL-4D	.530**	.540**	.450**	.558**	1	.623**
AQoL-8D	.514**	.522**	.648**	.597**	.623**	1
Ave	0.59	0.58	0.56	0.61	0.54	0.58

** . Correlation is significant at the 0.01 level (2-tailed).



MIC Study: Correlations

Pearson correlation between MAU Instruments (total sample, n=1,269):

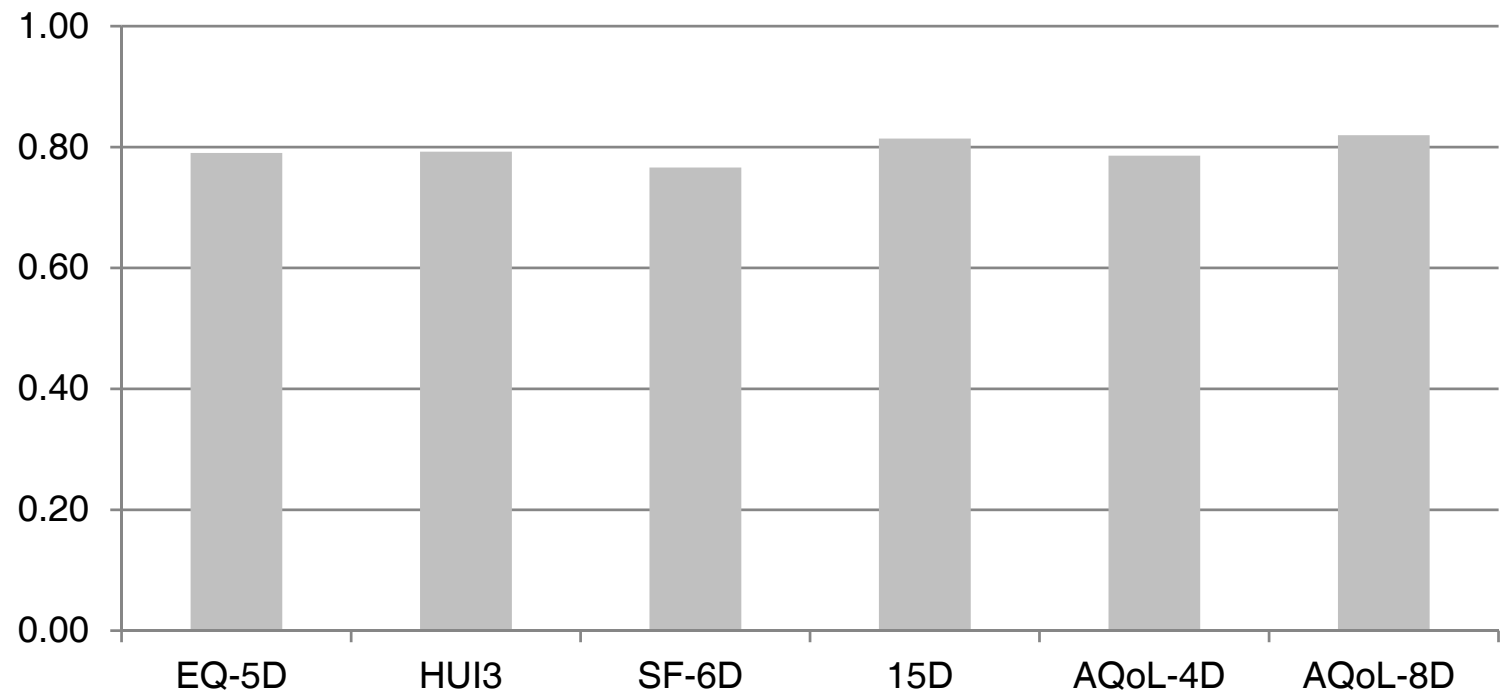
	EQ-5D	HUI3	SF-6D	15D	AQoL-4D	AQoL-8D
EQ-5D	1	.805**	.774**	.817**	.767**	.789**
HUI3	.805**	1	.720**	.837**	.784**	.816**
SF-6D	.774**	.720**	1	.783**	.749**	.806**
15D	.817**	.837**	.783**	1	.788**	.846**
AQoL-4D	.767**	.784**	.749**	.788**	1	.842**
AQoL-8D	.789**	.816**	.806**	.846**	.842**	1
Ave	0.79	0.79	0.77	0.81	0.79	0.82

** . Correlation is significant at the 0.01 level (2-tailed).



MIC Study: Average Pearson Correlations

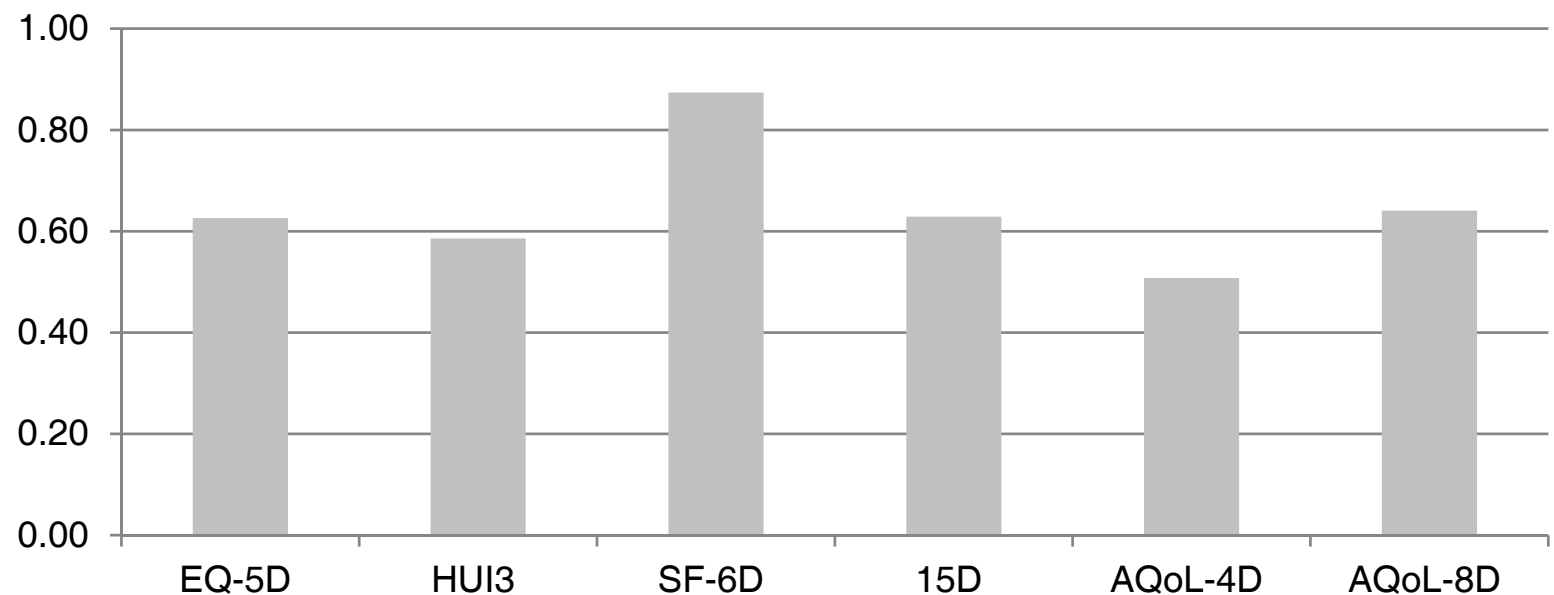
Pearson correlation with other MAU Instruments (total, n=1,269):





MIC Study: Pearson Correlations with SF-36

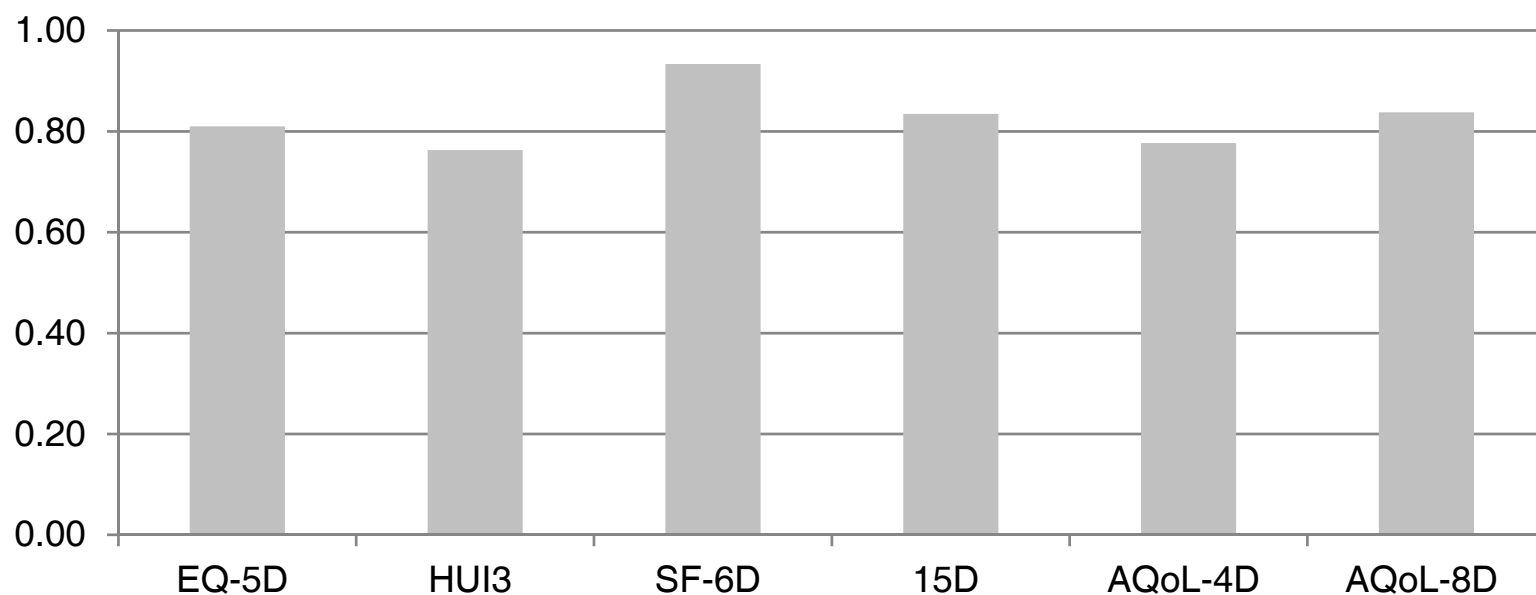
Pearson correlation of MAU Instruments with SF-36 (public, n=260):





MIC Study: Pearson Correlations with SF-36

Pearson correlation of MAU Instruments with SF-36 (total, n=1,269):





MIC Study: Intraclass Correlations

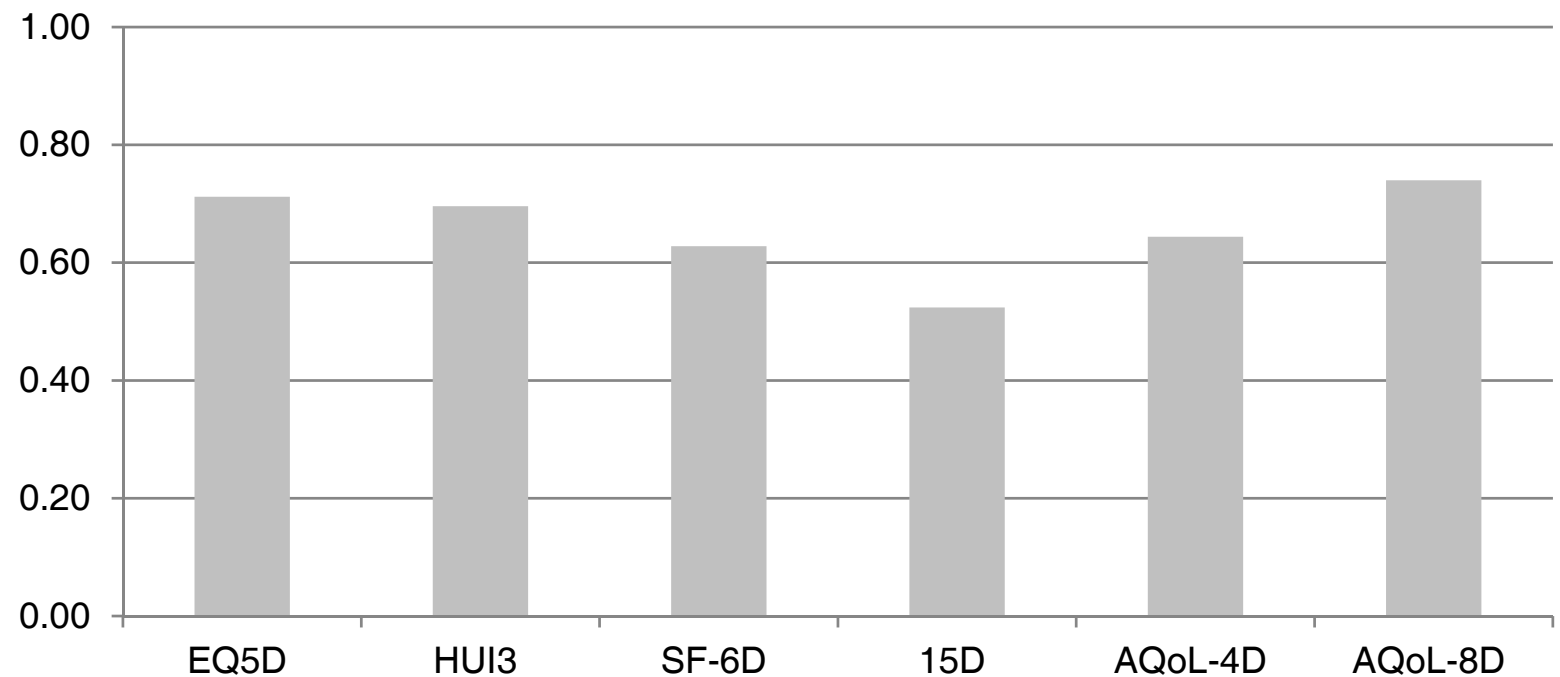
Intraclass correlation with other MAU Instruments (total, n=1,269):

Instrument	EQ5D	HUI3	SF-6D	15D	AQoL-4D	AQoL-8D
EQ5D		0.79	0.70	0.58	0.7	0.79
HUI3	0.79		0.60	0.53	0.76	0.80
SF-6D	0.70	0.60		0.51	0.59	0.74
15D	0.58	0.53	0.51		0.40	0.60
AQoL-4D	0.70	0.76	0.59	0.40		0.77
AQoL-8D	0.79	0.80	0.74	0.60	0.77	
Ave	0.71	0.70	0.63	0.52	0.64	0.74



MIC Study: Intraclass Correlations

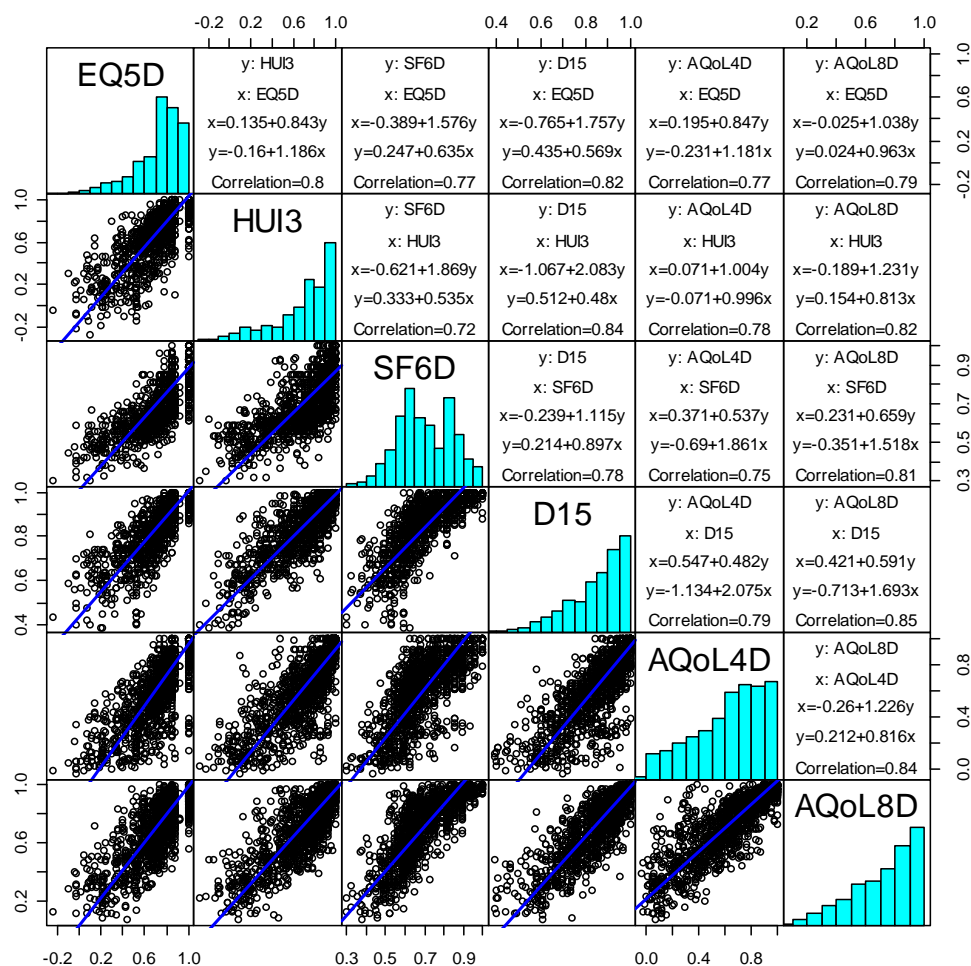
Average intraclass correlation with other MAU Instruments
(total sample, n=1,269):





MIC Study: Linear Relationships

Pairwise geometric regression results (total, n=1,269):





MIC Study: Linear Relationships

Discrepancies in marginal change between instruments
based on pairwise geometric regression results (total, n=1,269):

(coefficients b for “instrument A = a + b instrument B”)

Instrument	EQ-5D	HUI3	SF-6D	15D	AQoL-4D	AQoL-8D
EQ-5D (EQ)	1.00					
HUI3 (H)	H=1.19(EQ)	1.00				
SF-6D (SF)	EQ=1.58(SF)	H=1.87(SF)	1.00			
15D (D)	EQ=1.76(D)	H=2.08(D)	SF=1.12(D)	1.00		
AQoL-4D (A4)	A4=1.18(EQ)	H=1.00(A4)	A4=1.86(SF)	A4=2.08(D)	1.00	
AQoL-8D (A8)	EQ=1.04(A8)	H=1.23(A8)	A8=1.51(SF)	A8=1.69(D)	A4=1.23(A8)	1.00
Ave % Diff	35.0	47.4	58.8	74.6	47.0	34.0

Note that constant terms in equations have been dropped. Equations are arranged to obtain $b > 1$ as a consistent index of deviation, which is permitted due to the use of geometric mean regressions.



Some Implications at a Glance:

- The MIC Study probably offers the most comprehensive comparison of MAU instruments done in Germany to date.
- **Differences between MAU instruments**
 - in constructs and descriptive systems
 - necessarily lead to differences in utility values.
- **Incremental utilities**
 - form the basis of “cost utility analysis”
 - but may vary by up to 100 percent between MAU instruments
 - according to geometric regression analyses.



Thank you for your attention!

Professor **Michael Schlander**, M.D., Ph.D., M.B.A.

Contact

www.innoval-hc.com

www.michaelschlander.com

michael.schlander@innoval-hc.com

michael.schlander@medma.uni-heidelberg.de

Address

An der Ringkirche 4

D-65197 Wiesbaden / Germany

INNOVAL^{HC}
Institute for Innovation & Valuation
in Health Care

Special thanks go to Professor Jeffrey Richardson and his team at Monash University, Melbourne / Australia, without whom the MIC Study and this research would not exist.