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Report on value Sets for EQ-5D-Y in Germany, Slovenia and Spain and comparison of adolescents and adult preferences on health states (D5.1)

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Content

a) Report on value sets of EQ-5D-Y in Germany, Slovenia and Spain (WP5)

A value set for EQ-5D-Y was produced in Germany (Kreimeier et al., 2022; published; reference see attachment), Slovenia (Rupel, Ogorevc et al., 2021; published; reference see attachment) and Spain (Ramos-Goñi et al., 2021; published; reference see attachment) according to the EQ-5D-Y valuation protocol (Ramos-Goñi JM, Oppe M, Stolk E et al. International valuation protocol for the EQ-5D-Y-3L. PharmacoEconomics. 2020;38:1315–25). Prior to data collection, ethics approval was obtained in each country.

Methodological details:

In each of the three countries, online discrete choice experiments (DCE) were used to obtain preferences of the adult general population on health states for children and adolescents. Participants of these online DCE surveys were recruited by market research companies. Adults from the general population were asked to value different health states described by the EQ-5D-Y for a 10-year-old child. Within each DCE, two health states were presented next to each other and the participants were asked to choose that health state that they preferred for a 10-year-old child. Each participant completed 15 DCE tasks as well as 3 DCE tasks for quality control reasons. Data collection in the three countries was conducted from December 2019 to March 2020 and in each country, we aimed for a sample size of n=1000 participants and a representative sample in terms of age, gender and region.

In addition to the DCE data collection, data from composite time-trade off (cTTO) interviews were collected. This was necessary as the DCE only produces latent scale values which need to be rescaled on a full health (1) and dead (0) scale. In a cTTO tasks, a participant decides between a shorter duration of life in full health and a longer period of life years with impaired health. The participants trade life years until a number of life years is found, at which the respondent is indifferent. The data from cTTO interviews can be used for rescaling the DCE values. Also for these tasks, the health states that were rated were described by the EQ-5D-Y and adult participants were asked to imagine a 10-year-old child. cTTO interviews were carried out by interviewer-assisted interviews in each country. Most of these interviews were done face-to-face, while some needed to be conducted online due to the beginning of the COVID-pandemic. The data collection, which was organised by the research team in each country with an individual strategy, was done between November 2019 and June 2020 with a planned sample size of about n=200, which should be controlled for age and gender, but not necessarily representative. The data collection by cTTO was not funded by the Impact HTA project, it was funded

separately by the EuroQol Research Foundation. This additional data collection and funding was necessary to enable the development of value sets in a standardised way according to the recently published EQ-5D-Y valuation protocol. Only this ensures later acceptance of the value sets.

For the analysis in the context of the EQ-5D-Y value sets, first the DCE data were modelled and then rescaled to the 1 (full health) to 0 (dead) scale, e.g. by anchoring on the mean value of the pits state (i.e. worst possible health state of EQ-5D-Y, 33333) obtained through cTTO (approach used in Slovenia). For the analysis, slightly different approaches were used in the different countries because the choice of an approach depends on the data structure.

Further details on the methods for data collection and details of the analyses that each country did can be found in the three papers. The Slovenian, Spanish and German paper are already published and available.

Results:

In Slovenia, a sample of n=1074 adults completed the DCE survey and n=200 cTTO interviews were done. The DCE sample was mostly represented in terms of age, gender and region. All the estimated coefficients of the mixed logit model were statistically significant at the 1% level and had an expected negative sign. The analysis showed that the most important health dimension in EQ-5D-Y is pain/discomfort, followed by anxiety/depression, usual activities, and mobility, with self-care being the least important health dimension. The table 2 of the paper (see below, Figure 1) shows the coefficients of the Slovenian value set. The value set has a relatively large range from -0.691 to 1.

Table 2 Regression results of mixed logit model and rescaled coefficients using anchor score

	Mixed logit		Rescaled[a]
	Coeff.	Std. dev.	Coeff.
Mobility 2	− 0.562*** (0.070)	0.215 (0.171)	− 0.083*** (0.011)
Mobility 3	− 2.062*** (0.122)	1.346*** (0.156)	− 0.305*** (0.016)
Self-care 2	− 0.314*** (0.067)	0.372** (0.122)	− 0.046*** (0.009)
Self-care 3	− 1.491*** (0.100)	0.923*** (0.129)	− 0.221*** (0.013)
Usual activities 2	− 0.714*** (0.058)	0.502*** (0.101)	− 0.106*** (0.009)
Usual activities 3	− 2.177*** (0.097)	1.275*** (0.109)	− 0.322*** (0.013)
Pain/discomfort 2	− 1.097*** (0.065)	0.890*** (0.0838)	− 0.162*** (0.010)
Pain/discomfort 3	− 3.126*** (0.125)	2.101*** (0.123)	− 0.463*** (0.016)
Anxiety/depression 2	− 0.793*** (0.064)	0.738*** (0.084)	− 0.117*** (0.009)
Anxiety/depression 3	− 2.565*** (0.110)	1.907*** (0.104)	− 0.380*** (0.014)
Log-Likelihood	− 7369.1		
AIC	14868.27		
BIC	15367.93		
Observations	16110		
Respondents	1074		

*$p < 0.001$

[a]Bootstrapped (10,000,000 simulations)

Figure 1: Slovenian value set of EQ-5D-Y

(Source: Rupel et al., 2021; full reference see attachment)

In Germany, a sample of n=1,030 participants was recruited for the DCE survey and n=215 participants completed the cTTO interviews. The DCE sample was representative for the German general population aged 18 years and older with respect to gender, age groups, educational level and region/federal state. The results from the mixed logit model showed also for Germany that the most important dimensions in terms of child health were pain/discomfort and anxiety/depression, followed by usual activities, self-care and mobility. The predicted values of the value set range from -0.283 (for 33333) to 1 (for 11111). Figure 2 shows the table 4 of the German value set paper. The last column contains the final value sets coefficients.

Table 4 Modelling results for the German EQ-5D-Y value set

Independent variables of the model	Latent scale[a]			Rescaled[b]
	Coefficient	SD	Relative attribute importance (%)	Value set
MO2	− 0.1778** (0.0767)	0.1650 (0.1233)	9.2	− 0.0242
MO3	− 0.8627*** (0.1236)	1.0468*** (0.0936)		− 0.1175
SC2	− 0.1401** (0.0566)	0.4098*** (0.1359)	11.3	− 0.0191
SC3	− 1.0652*** (0.0849)	0.5188*** (0.1169)		− 0.1450
UA2	− 0.6145*** (0.0548)	0.1687 (0.2060)	15.5	− 0.0837
UA3	− 1.4636*** (0.0845)	0.5726*** (0.0919)		− 0.1993
PD2	− 0.9820*** (0.0594)	0.0632 (0.0881)	32.7	− 0.1337
PD3	− 3.0772*** (0.1323)	1.4831*** (0.0976)		− 0.4190
AD2	− 0.9213*** (0.0581)	0.2160 (0.1664)	31.3	− 0.1254
AD3	− 2.9521*** (0.1220)	1.6490*** (0.0949)		− 0.4019
Log-likelihood	− 6094			
Observations	30,900			
Sample size	1030			

Numbers in parentheses represent standard errors

AD feeling worried/sad/unhappy, *cTTO* composite time trade-off, *DCE* discrete choice experiment, *MO* mobility, *PD* having pain/discomfort, *SC* looking after myself, *SD* standard deviation, *UA* doing usual activities

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

[a]Based on a mixed logit model, with all parameters modelled as random and normally distributed, using 5000 Halton draws. Coefficients indicate the decrement from level 1 to the respective level

[b]Rescaled using a linear mapping model between the DCE results and the adjusted mean values from the cTTO task

Figure 2: German value set of EQ-5D-Y

(Source: Kreimeier et al., 2022; full reference see attachment)

In Spain, the final DCE sample consisted n=1005 participants and there were n=200 participants in the cTTO sample. The DCE sample was similar in the distribution of age, sex, employment status and education compared to the Spanish population. The results of the finally chosen modelling approach for the value set indicate that the most important dimension is pain/discomfort, followed by anxiety/depression, mobility, usual activities, and self-care. The Spanish value set coefficients can be found in Figure 3 which shows table 4 of the Spanish value set paper.

Table 4. Spanish EQ-5D-Y value set.

Dimension	Regular dummies	Coefficient (value set)	Std. error	Incremental dummies	Coefficient	Std. error	*P*-value
Mobility (walking about)	No problems to some problems	0.1040	0.0109	No problems to some problems	0.1040	0.0109	.0024
	No problems to a lot of problems	0.2892	0.0160	Some problems to a lot of problems	0.1851	0.0124	.0006
Looking after myself	No problems to some problems	0.0513	0.0125	No problems to some problems	0.0513	0.0125	.0268
	No problems to a lot of problems	0.1959	0.0159	Some problems to a lot of problems	0.1446	0.0185	.0043
Doing usual activities	No problems to some problems	0.1002	0.0130	No problems to some problems	0.1002	0.0130	.0045
	No problems to a lot of problems	0.2609	0.0065	Some problems to a lot of problems	0.1607	0.0110	.0007
Having pain or discomfort	No to some	0.1719	0.0141	No to some	0.1719	0.0115	.0006
	No to a lot of	0.4647	0.0115	Some to a lot of	0.2928	0.0207	.0008
Feeling worried, sad, or unhappy	Not to a bit	0.1144	0.0267	Not to a bit	0.1144	0.0110	.0019
	Not to very	0.3285	0.0110	A bit to very	0.2141	0.0137	.0006

Std. indicates standard.

Figure 3: Spanish value set of EQ-5D-Y

(Source: Ramos-Goñi et al., 2021; full reference see attachment)

The comparison of the three EQ-5D-Y value sets indicate that adults of the general population in Germany, Slovenia and Spain have a relatively similar perception of the importance of the health dimensions of EQ-5D-Y in the context of youth health. In each country, pain/discomfort and anxiety/depression turned out to be the most important dimensions. However, the value range differs. The three value sets are some of the first worldwide and will enable cost-utility analysis for health care interventions in children and adolescents.

Attachments for report a):

Slovenian EQ-5D-Y value set:

Rupel V, Ogorevc M, IMPACT HTA HRQoL Group (2021): EQ-5D-Y Value Set for Slovenia. PharmacoEconomics, 39: 463–471; https://doi.org/10.1007/s40273-020-00994-4.

German EQ-5D-Y value set:

Kreimeier S, Mott D, Ludwig K, Greiner W, IMPACT HTA HRQoL Group (2022). EQ-5D-Y value set for Germany. PharmacoEconomics, in press; https://doi.org/10.1007/s40273-022-01143-9.

Spanish EQ-5D-Y value set:

Ramos-Goñi JM, Oppe M, Estévez-Carrillo A, Rivero-Arias O, IMPACT HTA HRQoL Group (2021): Accounting for unobservable preference heterogeneity and evaluating alternative anchoring approaches to estimate country-specific EQ-5D-Y value sets: a case study using Spanish preference data. Value in Health 25(5): 835-843, in press; https://doi.org/10.1016/j.jval.2021.10.013.

b) Report on comparison of EQ-5D-Y health state preferences obtained from adolescents for themselves and those obtained from adults considering a 10-year old child in Germany and Spain (WP5)

Methodological details:

To explore differences of EQ-5D-Y health state preferences obtained from adolescents and those obtained from adults considering a 10-year old child, online surveys using discrete choice-experiments (DCEs) were done to obtain the health state preferences from both samples in Germany, Slovenia and Spain. The respondents were recruited by market research agencies in all three countries. In each country, a sample of adults of the general population valued EQ-5D-Y health states by imagining a 10-year old child, while a sample of adolescents valued EQ-5D-Y health states for themselves. In the DCE tasks each respondent has to choose the preferred health states out of two health states presented next to each other (see explanation also in report a)). The DCE data were modelled using mixed logit models and model coefficients were rescaled to a 1 (best) - 0 (worst) scale for purpose of comparison. The differences between preferences in both samples were analysed via the relative importance of health dimensions.

Results:

An overall sample of n=3,109 adults and n=2,129 adolescents completed the DCE surveys with an acceptable quality of responses. Thereof, n=1,030 adults and n=710 adolescents came from Germany, n=1,074 adults and n=717 adolescents were recruited in Slovenia and n=1,005 adults and n=702 adolescents came from Spain. Health state preferences of adults and adolescents showed significant differences in all three countries. The overall relative importance of health dimensions was similar between adolescents and adults; however, it could be observed that adolescents usually gave more importance to the dimensions mobility and self-care, and less to anxiety/depression. Differences by country (Germany, Slovenia and Spain) were detected in the rank-order of the dimension level combinations between adults and adolescents.

Details of the methods and analysis applied and the results are available in the following paper.

IMPORTANT: For citing purpose, please also refer to that paper:

Rupel V, Ramos-Goñi JM, Ogorevc M, Kreimeier S, Ludwig K, Greiner W. (2021): Comparison of adult and adolescent preferences towards EQ-5D-Y-3L health states. Value in Health, 24(9): 1350-1359; https://doi.org/10.1016/j.jval.2021.03.019.