Capability Well-being and Health: Monetary Valuation and Population Normative Data

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Contents

I. Research background and justification for the selection of the topic

Typically, Cost Effective Thresholds (CET) are set to be reflective of the opportunity cost of investing in new technology. While these thresholds are helpful, as stated, it remains essential to consider the 'value' individuals in a particular country place on health goods. This is an indicator of what citizens want from their health care system (Woods et al., 2016). It is also important to note that all evaluations will to some extent contain some uncertainty (Drummond et al., 2015). This paper's empirical section will focus on estimating Hungary's WTP to improve their health. Moving beyond the QALY, capability instruments have in recent years shifted towards being used as measures in economic evaluations with some decision-making institutions recommending that they be included in some contexts (Helter et al., 2020). These were inspired by Sen's capability framework (Sen, 1993). This paper will explore Subjective Well Being in detail. Determinants of well-being will be presented, with particular focus on health and capability. An estimation of the monetary value of a year in full capability (YFC) will

be calculated and compared to monetary value of a QALY for the Hungarian population. Another important element of healthcare that decision makers need to consider is the different patient groups and the general population. There is extensive research that has been done showing that clinical and cost effectiveness can differ by patient subgroups. This means that while an intervention could potentially achieve high value for money for one subgroup, it does not necessarily mean it will be as effective for all subgroup (Drummond, 2013). In this paper, population norms based on a large representative general population sample in Hungary will be presented to compare VAS and capability scores.

II. The methods used

Monetary Valuation

The 3-step wellbeing valuation (3S-WV) approach consists of 3 equations by Fujiwara (Fujiwara, 2013), OECD (Oecd, 2018) and Himmler (Himmler et al., 2020) as follows:

The first equation is the income model where $SWB_i = f(ln(M_i)$

The second equation is the Non-Market Good Model where $SWB_i = g(Q_i)$

The third equation is the Monetary Equivalent Value where $MRS_{Q,M}$ is calculated

The CS can be calculated using the below equation where the use of log income reflects diminishing marginal utility of income: $\boldsymbol{CS = M^0 - e^{[\,ln(M^0) - \frac{g'Q}{f'M}]}}$

Empirically, the SWB Function will take the form:

$$\boldsymbol{SWB = \beta_0 + \beta_1 H_i + \beta_2\, ln(M_i) + \beta_3 X_i + \varepsilon_i}$$

$$\boldsymbol{SWB = \alpha_0 + \alpha_1 CW_i + \alpha_2\, ln(M_i) + \alpha_3 X_i + \varepsilon_i}$$

In the above equation, CW and H represent Capability and health respectively

Population Norms

For population norms, A sub-group analysis was conducted on VAS and ICECAP-A scores based on socio-demographic factors: age group, gender, education,

employment status, marital status, monthly net household income, and household size.

Non-parametric tests were used to analyze the differences between the different groups.

Data Collection

- Data for the study was obtained from a cross sectional, representative online survey on the Hungarian population (aged 18 and above)
- A total of 2001 respondents participated in the study in February 2020
- Socio-demographic data such as gender, age, level of education, employment status, marital status, monthly net household income, and household size were collected
- Survey questions covered subjects of interest such as wellbeing, health, satisfaction, and happiness using standardized questionnaires namely: VAS, ICECAP-A, FSSQ, and SWLS

III. Scientific results of the dissertation

Monetary Valuation

Base case and robustness check

	Base Case	Life Satisfaction (1-10)	Unweighted averaged of LS and SWLS (0-10)	ICECAP-A (Unweighted and Rescaled)	Mean Yearly income	Δ set to 0.05	Δ set to 0.20
Regression coefficients			0.21				
Log Income VAS	0.88	0.13		0.88			
Log Income ICECAP-A	1.04	0.21	0.28	1.13			
VAS	5.59	2.81	2.34	5.59			
ICECAP-A	12.05	5.36	4.69	14.99			
CS in EUR							
1 QALY	35 886	68 017	51 160	35 885	42 427	41 482	27 509
1YFC	52 883	70 956	62 724	56 522	62 522	67 859	34 692
Relative value (YFC/QALY)	1.47	1.04	1.23	1.58	1.47	1.64	1.26

- Health (VAS) and capability (ICECAP-A) and income had a positive and significant effect on SWB (5.59 and 12.05 respectively).
- Other factors that were expected to have a positive effect on SWB such as, having tertiary education, being employed and being in a partnership were also confirmed by the regression analysis
- Income, as expected, is statistically significant in both regressions and has positive coefficients
- The FSSQ coefficient in both regressions is also significantly significant and positive (coefficient was 1.83).
- The age and age squared variables were also in line what has been found in literature
- The monetary value of one QALY and one YFC were 35 886 EUR and 52 883 EUR respectively.

Population Norms

- For the overall sample, the average ICECAP-A and VAS score is 0.7 (SD=2.23)
- Comparing the average scores by gender, the amounts are the same for men and women with the mean score being 0.7 (SD=2.23).
- Differences were more noticeable in the age groups with the highest average VAS score belonging to the 18-24 and 25-34 0.74 (SD=0.21)

and 0.73 (SD=0.24) respectively) and an average ICECAP-A score of 0.74 (0.19) for the oldest age group (65+)

- For both measures, the scores decline as the age increases and then at age 65+, there is a spike again
- The average ICECAP-A scores are higher for males and females of almost all age groups (scores range between 0.71 and 0.77 for those with partners compared to 0.55 and 0.68 for those without partners.
- For most of the groups, the average scores were higher for employed individuals when compared to unemployed individuals for both VAS and ICECAP-A
- Those with tertiary education also tended to have higher average scores than those with primary and secondary education
- For income, the mean scores look to increase as income became higher, the 'More than 500000' group had the highest average score for both VAS

and IECAP-A with 0.81 (SD=0.16) and 0.84 (SD=0.15) respectively.

Short discussion:

Monetary Valuation

- An Australian well-being valuation study calculated 28 112 EUR as the 'shadow price' of a QALY over a 2-year rolling window and 44 845 EUR in the long run
- A UK study estimated 36 712 EUR as the monetary value for a QALY
- The EuroVaQ (European Value of a QALY) found the Hungarian estimate to be between 13 008 EUR and 25 709 EUR
- The Hungarian Thresholds Working Group, recommend CET of 1.5-3.0 times the gross domestic product (GDP) per capita per QALY which is 25 165-50 331 EUR/QALY
- For a UK study, the estimated monetary value of a full year in capability was found to be 79 416 EUR

- The YFC concept is relatively new and extensive literature is still needed
- Despite this shortcoming, the YFC is still believed to be a useful tool for decision making

Population norms

- Population norms conducted in different countries can provide invaluable information on population health characteristics
- Though initially both measures had similar result for the average population score, the average differences between the two measures became evident once analysis was done on the different groups that make up the population
- A study calculated European VAS value set using data from valuation studies in 6 countries. For different age groups in Hungary, the ratings ranged between 0.53 and 0.83. The rating for total sample is 0.7. This is fairly similar to the results found for this paper

IV. Main references

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V. List of own (or co-authored) publications on the topic

Article

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Conference Abstracts

Thema M., Rencz F., Pentek M., Brodszky V. 2020. PNS45 Monetary Valuation of a QALY Based on Demographics, Health Status, Income and Well-Being in Hungary. Value in Health

Thema M., Brodszky V. 2022. POSB215 Monetary Value of Life Years in Full Capability Applying the Well-Being Valuation Approach in Hungary. Value in health