Who prefers death to life in composite time trade-off interviews and why: A mixed-methods analysis of the Singapore EQ-5D-5L valuation study

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Ling Jie CHENG[1], Annushiah VASAN THAKUMAR[1], Nan LUO[1]

[1] Saw Swee Hock School of Public Health, National University of Singapore, Singapore, Singapore

INTRODUCTION & OBJECTIVE

- The EuroQol Valuation Technology (EQ-VT) employs a composite time trade-off (cTTO) design, using a 20-year timeframe that includes 10 years in full health (i.e., lead-time) to evaluate states considered worse than death, with values ranging from -1 to 1.
- Numerous EQ-5D-5L valuation studies have noted a significantly high frequency of "-1" values.
- However, respondents' characteristics associated with this death-preferring response and underlying reasons remain unclear.
- This study aimed to identify the characteristics of respondents associated with "-1" cTTO value in the new Singapore EQ-5D-5L valuation study and to explore the rationale behind this seemingly unusual preference.

METHOD

- Five hundred adult Singaporeans were quota-sampled by age, sex, ethnicity, and education.
- Participants completed 20 cTTO tasks through computer-assisted personal interviews, either face-to-face or via Zoom, using the EQ-VT tool.
- At the end of the interviews, a closed-ended question was used to ascertain respondents' priorities during cTTO tasks, and open-ended questions were used to explore the reasoning behind their general preferences.
- We used univariate and multivariable two-part models (mixed discrete-continuous outcomes) to identify respondent characteristics associated with the "-1" value and primary priorities when comparing Life A and Life B.
- Qualitative feedback from respondents was summarized using content analysis, focusing on the association between their priorities and tendencies of preferring death.

RESULTS

- Participants had a mean age of 48.1 years (SD 16.6), were predominantly Chinese ethnicity (76.8%), held at least a diploma (46.6%), and were equally distributed across genders.
- This Singapore EQ-5D-5L valuation study observed a 16.1% occurrence of the "-1" value; 128 (25.6%), 70 (14.0%), and 60 (12.0%) respondents assigned "-1" to 1-4, 5-9, and ≥10 health states, respectively.
- Age, education level, marital status, interviewer, and experience of serious illness in caring for others were associated with the number of "-1" in simple linear regression analysis.
- However, only age remained significant in the multivariable analysis (β: 1.07, 95% CI: 0.04, 2.11), with middle-aged respondents (mean 3.82, SD 4.91) assigning more "-1" values than young respondents (mean 2.37, SD 3.71) (**Table 1**).
- When comparing Life A and B, physical (89.0%), mental (83.2%), and financial (78.8%) burden related to poor health was the primary consideration among respondents.
- Specifically, the middle-aged group reported physical (91.1%), mental (87.1%), and financial (83.8%) burdens as their primary considerations.
- This observation was supported by qualitative feedback, which highlighted that the primary reason for preferring death over life was to avoid imposing physical and mental burden on family members (**Table 2**). Additionally, the middle-aged group often mentioned financial burden and medical costs as concerns, saying, "*I don't want to burden people around me and waste money on hospital bills*" (Female, Malay, 49 years old) and "*The cost of treatment can burden my family*" (Male, Malay, 46 years old).
- Whereas the young and old groups focused on the loss of enjoyment and dignity, with one participant stating, "*I should be able to do things that I like*" (Male, Chinese, 26 years old).

Table 1. Two-part models analyses of factors associated with health state value '-1'.

Variables	Sum of health states as '-1' value			
	β (95% CI)	*p*-value	Adj β (95% CI)	*p*-value
Age (ref: 21-44)				
45-64	**1.45 (0.56, 2.34)**	**0.001**	**1.07 (0.05, 2.08)**	**0.04**
≥65	**1.53 (0.46, 2.59)**	**0.005**	0.70 (-0.51, 1.92)	0.26
Gender (ref: Male)				
Female	-0.28 (-1.08, 0.52)	0.50		
Ethnicity (ref: Chinese)				
Malay	-0.35 (-1.46, 0.76)	0.53		
Indian / Others	0.85 (-0.64, 2.34)	0.27		
Education (ref: Tertiary)				
Non-tertiary	**1.00 (0.20, 1.80)**	**0.01**	0.46 (-0.39, 1.31)	0.29
Marital status (ref: Married)				
Single	**-1.08 (-1.91, -0.25)**	**0.01**	-0.42 (-1.36, 0.53)	0.39
Widowed/Divorce/Separated	0.55 (-0.90, 1.99)	0.46	0.35 (-1.02, 1.72)	0.61
Employment status (ref: Employed)				
Non-employed	0.23 (-0.63, 1.10)	0.60		
Religious (ref: Buddhism/Taoism)				
Islam	-0.57 (-1.80, 0.67)	0.37		
Christianity	0.30 (-0.84, 1.45)	0.60		
Others (Hinduism, Sikhism, refuse to answer)	-0.43 (-1.50, 0.63)	0.42		
Housing type (ref: HDB 4-5 room/executive)				
HDB 1-3 room	0.67 (-0.37, 1.70)	0.21		
Private	-0.11 (-1.21, 0.98)	0.84		
Interviewer (ref: #1)				
#2	-1.09 (-2.25, 0.06)	0.06	-0.83 (-1.97, 0.31)	0.15
#3	**-1.19 (-2.34, -0.04)**	**0.04**	-0.98 (-2.12, 0.15)	0.09
#4	0.13 (-1.19, 1.45)	0.85	0.43 (-0.88, 1.75)	0.52
#5	**-1.93 (-3.56, -0.31)**	**0.02**	**-1.87 (-3.43, -0.31)**	**0.02**
Experienced serious illness in yourself? (ref: No)				
Yes	0.34 (-0.47, 1.15)	0.41		
Experienced serious illness in your family? (ref: No)				
Yes	0.23 (-0.58, 1.03)	0.58		
Experienced serious illness in caring for others? (ref: No)				
Yes	**1.10 (0.14, 2.05)**	**0.03**	0.67 (-0.27, 1.60)	0.16

Note: Adj β = Adjusted Coefficient; CI = Confidence interval.

Table 2. Content analysis of the priorities by different age groups.

Age group (21-44)	n (%)	Age group (45-65)	n (%)	Age group (>=65)	n (%)
Total codes: 210		**Total codes: 179**		**Total codes: 111**	
Pain & Discomfort	42 (20%)	Burden to Family/Others	36 (20%)	Burden to Family/Others	22 (20%)
Burden to Family/Others	30 (14%)	Pain & Discomfort	34 (19%)	Pain & Discomfort	18 (16%)
Mental Health	26 (12%)	Financial Burden	22 (12%)	Mobility	12 (11%)
Self-care/Independence	16 (8%)	Mobility	16 (9%)	Mental Health	10 (9%)
Mobility	15 (7%)	Mental Health	15 (8%)	Healthy/Quality life	10 (9%)

Note: n = Number of responses; % = Percentage.

CONCLUSIONS

- The preference for immediate death over living in very poor health states is common in Singapore, particularly among the middle-aged group. This unusual preference is primarily driven by concerns about the burden poor health places on the family, a sentiment that middle-aged Singaporeans might feel more acutely, likely due to their experiences caring for both the young and the elderly.
- Our study validates the very low health-state values observed in the EQ-5D valuation study in Singapore and may explain the excessive -1 values observed in other EQ-5D valuation studies across various Asian countries.

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CONTACT INFORMATION

Twitter: @JeremyChengLJ
Email Address: Sphclj@nus.edu.sg