

Developing an EQ-5D-5L Value Set Using Heart Disease Patients' Preferences

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BACKGROUND

Several studies have shown that patients with heart diseases value hypothetical health states differently from the general public.

Objectives

- (i) To develop an EQ-5D-5L value set using heart disease patients' preferences;
- (ii) compare it with the EQ-5D-5L value set developed using the general public's preferences.

METHODS

Eligibility Criteria

- For patients:
 - Recruited from hospital outpatient clinics.
 - Any patient who was hospitalized in the last 5 years primarily for heart failure and/or ischemic heart disease.
- For general population:
 - Recruited from selected residential area
- For patients and general population:
 - 21 ≤ age ≤ 80 years
 - Ability to read and communicate in English or Chinese

Valuation

- Face-to-face interviews using the EQ-VT.
- Each participant valuing 10 EQ-5D-5L health states using the composite time trade-off method.

Statistical Methods

- 9-parameter multiplicative non-linear random-effects models (MULT9) for disutility (1- utility) was used to developed value sets.

$$disutility = \alpha + \sum_i \alpha_i + \sum_d (\sum_l L_l x_{dl}) \beta_d + N_{45} x_{45} + e$$

- Compared the patient and general population value sets with interaction between dimension x population, $N_{12} \times$ population, $N_{45} \times$ population, adjusted for age, gender, education level, and ethnicity.

$$disutility = MULT9 + N_{12} x_{12} + \beta_{patient} x_{patient} + \sum_d (\sum_l L_l x_{dl} x_{patient}) \beta_{d \times patient} + N_{45 \times patient} x_{45} x_{patient} + N_{12 \times patient} x_{12} x_{patient} + age + gender + education + ethnicity + e$$

- Calculated difference between utility gain (mean utility difference) for transition among health states with full health, mild, moderate and severe severity using the patients and the general population value sets.

PARTICIPANTS

Table 1: Participant characteristics

Characteristic	Patients ¹ (N = 576)	General population ² (N=1000)
Male, %	72.2	47.1
Age (years), %		
21-40	7.8	42.0
41-60	47.4	41.1
>60	44.8	16.9
Mean (SD)	57.7 (11.5)	45.0 (15.4)
Ethnicity, %		
Chinese	56.9	75.3
Malay	20.7	12.8
Indian	16.8	9.9
Others	5.6	2.0
Education level, %		
Primary (6 years) or less	17.5	17.6
Secondary (11 years)	47.1	38.5
Diploma, University or higher	35.4	43.9
Health status on EQ-VAS, mean (SD)	77.2 (14.9)	79.6 (12.5)

¹ Coronary artery disease (79.0%), heart failure (27.3%), atrial fibrillation or flutter (21.2%), others (9.7%)

² From the Singapore EQ-5D-5L value set study

RESULTS

Table 2: MULT9 models for the patient and the general populations

Predictors	Patients Coefficient (SE)	General population Coefficient (SE)	Patients vs General population Coefficient (SE)#
Mobility	0.743 (0.053) ***	0.564 (0.035) ***	0.556 (0.032) ***
Mobility x Patients			0.118 (0.045) **
Self-care	0.657 (0.048) ***	0.461 (0.032) ***	0.426 (0.031) ***
Self-care x Patients			0.097 (0.047) *
Usual activities	0.475 (0.050) ***	0.317 (0.033) ***	0.294 (0.031) ***
Usual activities x Patients			0.072 (0.046)
Pain/discomfort	0.671 (0.047) ***	0.674 (0.035) ***	0.652 (0.032) ***
Pain/discomfort x Patients			-0.046 (0.045)
Anxiety/depression	0.422 (0.049) ***	0.553 (0.037) ***	0.509 (0.034) ***
Anxiety/depression x Patients			-0.198 (0.047) ***
N45 (severe health states)	0.240 (0.025) ***	0.316 (0.018) ***	0.172 (0.032) ***
N45 x Patients			-0.146 (0.051) **
N12 (mild health states)			-0.186 (0.033) ***
N12 x Patients			-0.135 (0.052) *
Patients (vs. General population)			0.158 (0.056) **
Level 1	0	0	0
Level 2	0.087 (0.013) ***	0.074 (0.011) ***	0.071 (0.009) ***
Level 3	0.185 (0.011) ***	0.154 (0.010) ***	0.139 (0.009) ***
Level 4	0.343 (0.010) ***	0.361 (0.009) ***	0.369 (0.008) ***
Level 5	1	1	1
Intercept	0.213 (0.026) ***	0.155 (0.020) ***	0.159 (0.072) *
Mean square error	0.007	0.004	
Mean absolute error	0.062	0.050	

*** P-value <0.001, ** P-value <0.01, * P-value < 0.05.

Model was adjusted for age, gender, education level and ethnicity.

Figure 1: Predicted utility values from MULT9 models

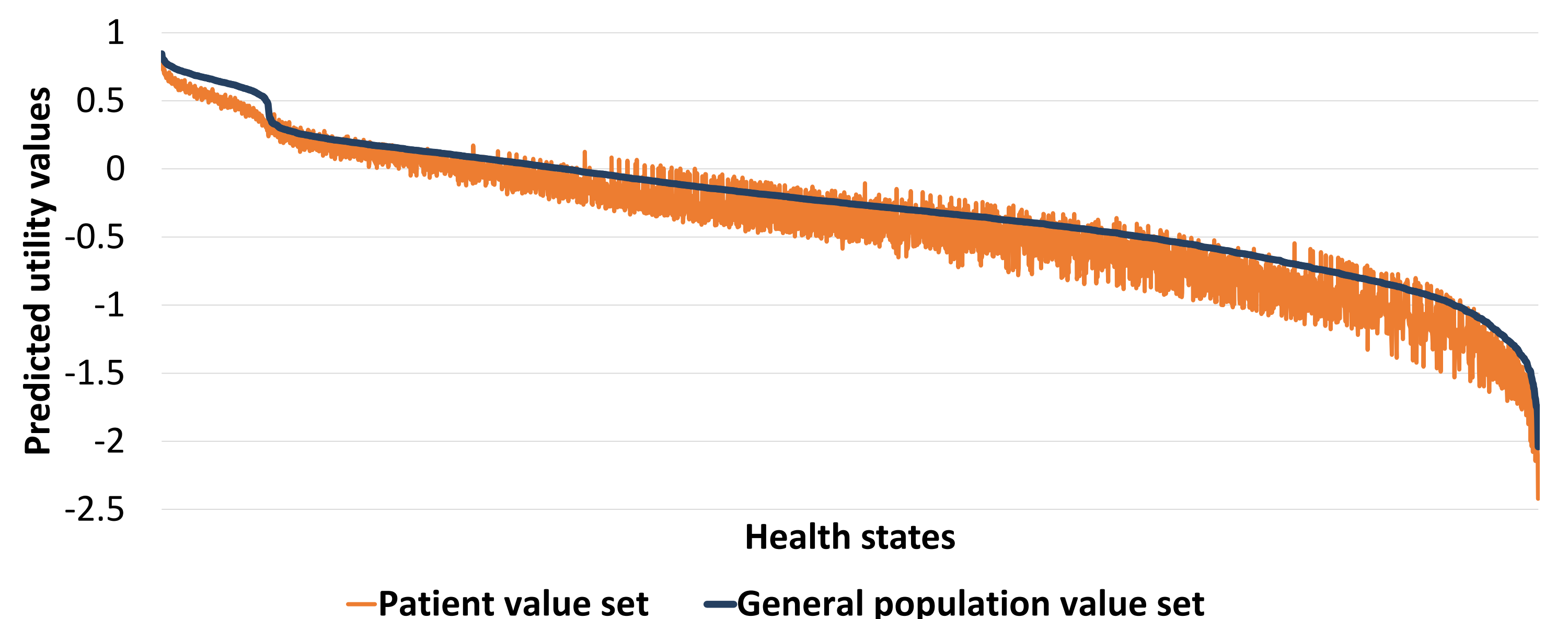


Table 3: Utility gains using the patient and general population value sets

Transition#	Patient value set Mean utility gain	general population value set Mean utility gain	Difference (Patient – General)
Mild → Full health	0.133	0.098	0.035
Moderate → Full health	0.302	0.222	0.080
Severe → Full health	1.257	1.185	0.072
Severe → Mild	1.124	1.087	0.037
Moderate → Mild	0.169	0.124	0.045
Severe → Moderate	0.955	0.963	-0.008

Mild states: All dimensions at either level 1 or 2; severe states: At least one dimension at either level 4 or 5; moderate states: Neither mild nor severe states.

CONCLUSIONS

- Heart disease patients value severe health states higher than the general population.
- Heart disease patients consider pain/discomfort and anxiety/depression less undesirable than the general population.
- Heart disease patient value set tends to give higher utility gain for treatment benefit than the general population.
- A value set reflecting patients' health preferences would be useful for clinical decision-making and evaluating healthcare interventions from patients' perspective.