Investigating the impact of prior ranking on VAS ratings for EQ-5D health states

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Background

- A range of techniques for eliciting valuation of different health states, but no consensus on a single preferred method.

- Ordinal data collection techniques had been largely ignored in health state valuation (in the past).

- Estimating cardinal value from ordinal information has been applied in many fields.

EQ-5D valuation

- EQ-5D valuation methods
    - Standard is a 20-cm VAS, designed for postal survey
    - The MVH protocol (since 1993) Including ranking, VAS, TTO

Literature review

- Ordinal preference measure now becoming acceptable.

  - based on Thurstone's Law of Comparative Judgement (1927)
  - Kind (1982) introduced the Thurstone's Law of Comparative Judgement to the context of health state valuation.
  - McFadden (1974) proposed an econometric tool – conditional logistic regression model.
  - Such regression method has been applied in studies by Salomon (2003), McCabe and Brazier et al. (2006), Crain et al (2008).
  - Others studies by Kind (2005) and Krabbe (2008).

Questions

- Does prior ranking have any influence on the results obtained by other methods?
  - Valuations from interview-based studies different from those based on other forms of administration (Weijen et al. 2003).
  - Independent issues including
    - Ranking + practice
    - Interviewer effect
    - Duration of health state

Study

- Data
  - 205 students in University of York
  - £10 pounds voucher as a reward
  - Collecting between May 19 to 30, 2008
- Questionnaire
  - Measuring health by EQ-5D, RANK and RATE task, participant's characteristics
  - RANK task vs. RATE task

Materials

	Group A	Group B
Step 1	Rank 20 health states	VAS rating 16 health states
Step 2	VAS rating 16 health states	Rank 20 health states

Analyses

- Logical inconsistency in VAS ratings
  - The valuation of a health state is inconsistent if the value is higher than the value of a health state that is dominant to that state, according to logical ordering of the health states.
  - For example, the value of state 22111 > the value of state 21111
- Non-parametric Wilcoxon rank-sum test

Study sample

	Total sample	Group A	Group B
Case number	205	100	105
Age	23.79 (5.02)	23.5 (4.74)	24.06 (5.29)
Gender (F)	60.98%	61%	60.95%
EQ-5D VAS	84.66 (10.26)	85.28 (10.88)	84.07 (9.66)
SAH* - Excellent or very good	76.59%	77%	76.19%
Difficulty**- Fairly or very easy	64.53%	61.22%	67.62%

*Self-assessed health – excellent, very good, good, fair and poor.

**Difficulty in completing the survey – very difficult, fairly difficult, fairly easy and very easy.

Results

- Logical inconsistency in VAS ratings

Number of logical inconsistency within subject	Total sample	Group A	Group B
0 and 1	85.37%	88%	82.86%
Above 2	14.63%	12%	17.14%

- Average VAS score for each health state in Group A and B

Health state	Group A	Group B	Difference
11111a	97.09	95.41	1.68*
11111b	96.81	95.02	1.79*
11112	79.02	73.37	5.65*
21111	77.66	72.09	5.57*
12211	64.67	58.94	5.73*
11122	62.07	58.90	3.17
22112	59.01	49.01	10.00*
22222	45.98	41.89	4.09
23321	41.50	36.23	5.27*
21323	34.36	33.53	0.83
23313	25.79	22.56	3.23
32313	23.98	21.59	2.39
32331	23.26	21.61	1.65
22233	22.55	18.31	4.24
33333a	5.23	5.23	0
33333b	4.84	5.18	-0.34

Discussion

- Prior ranking has significant impacts in the results of followed VAS rating.

  - Less logical inconsistency

  - Higher VAS valuation

- If logical consistency is a desirable property, the prior ranking should be recommended.