A comparison of the UK and Australian Interim Value Sets for the Weight-Specific Adolescent Instrument for Economic Evaluation (WAItE)

Putnam
Inizio Advisory

Tomos Robinson[1], Sarah Hill[2], Gang Chen[3], Yemi Oluboyede[2]
[1]Newcastle University, United Kingdom; [2]Putnam, United Kingdom; [3]Monash University, Australia

PT 1

Background

- Adolescent obesity is a public health problem in the UK and around the world
- Generic measures of Health-Related Quality of Life (HRQoL) used in adolescence (such as the CHU-9D) may not capture important aspects of HRQoL specific to certain health conditions, such as obesity
- The **W**eight-Specific **A**dolescent **I**nstrumen**t** for **E**conomic Evaluation (WAItE) is a weight-specific HRQoL measure, containing seven dimensions with five severity levels
- Two valuation studies (one in the UK and Australia) have been conducted using **Discrete Choice Experiments** (DCEs), administered to a representative samples of the respective adult populations
- Latent estimates from DCEs cannot be directly used to generate value sets, and must be anchored onto the 0-1 death-full health Quality Adjusted Life Year (QALY) scale
- We present the interim results from both valuation studies

Methods

- The design of both valuation studies are shown in **Table 1**

Table 1 – Valuation study design

	UK Valuation Study	Australian Valuation Study
Online DCE	✓	✓
D-Efficient Design	✓	✓
Adult Population (n=1005)	✓	✓
TTO Anchoring	✓	X
EQ-VAS Anchoring	✓	✓
CWD Anchoring	X	✓
Mixed Logit Model	✓	✓
Rank Ordered Logit Model	X	✓

Abbreviations: CWD, Comparisons with death; VAS, visual analogue scale; TTO, time trade-off

- The **TTO anchoring** method involves a set of respondents completing a TTO task for the PITS state (the worst state possible from the WAItE descriptive system) and using this value to reweight the latent estimates from the DCE
- The **EQ-VAS anchoring** method involves respondents completing the Visual Analogue Scale (VAS) for three health states (full health, the PITS state and death) and using these values to reweight the latent estimates from the DCE (Webb *et al* 2020)
- The '**Comparisons with Death' CWD anchoring** method involves the respondent answering an additional question after each choice whether they consider either of the two health states to be worse than death, with the death coefficient being used to reweight the latent estimates from the DCE (Krabbe *et al* 2020)
- **Relative Attribute Importance (RAI)** scores were used to compare the relative importance of the seven WAItE attributes in both populations

Results

- The ranking of the RAI scores for the UK and Australian samples are represented in **Figure 1** and **Figure 2**
- The 'Tiredness' and 'Unhappiness' dimensions were considered the most important and second most important dimensions in both the UK and Australian populations
- The 'Sports' dimension was considered the least important dimension in both populations

Figure 1 – RAI Score rank (UK)

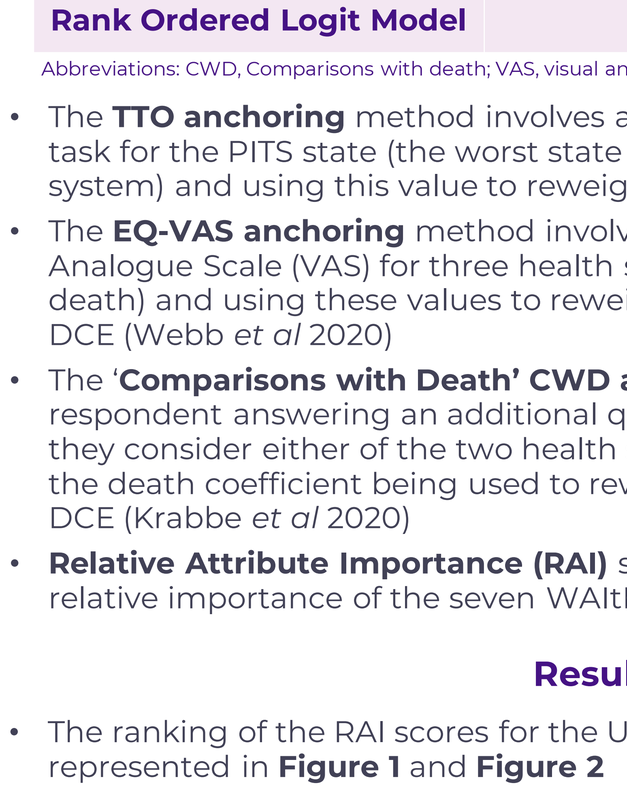
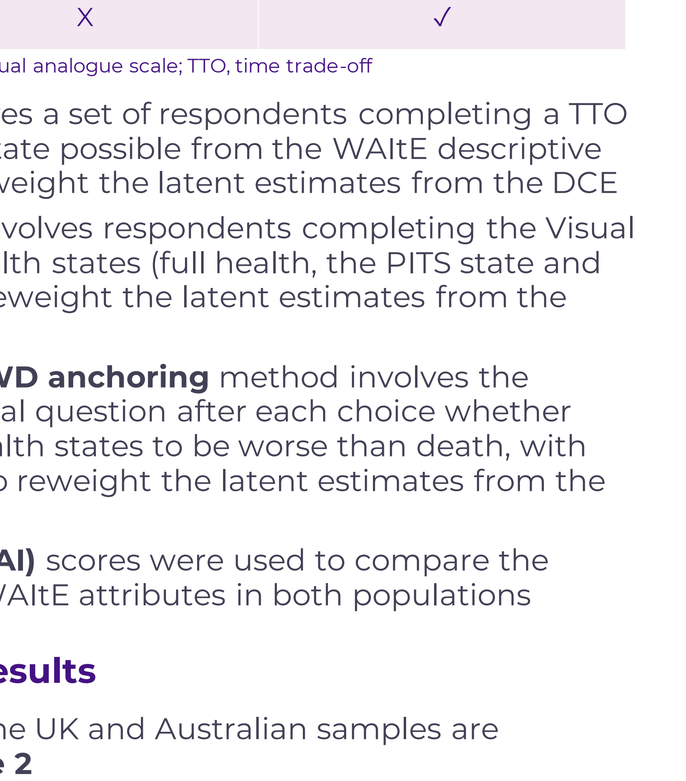


Figure 2 – RAI Score rank (Australia)



Results continued

- Values for the 'PITS State' using the different anchoring methods are shown in **Table 2**, with full results from the regression models shown in **Table 3**
- For the UK sample, the different anchoring methods generated similar value sets – the values of the 'PITS state' were 0.230 and 0.289 using the TTO and EQ-VAS anchoring methods

Table 2 – 'PITS State' Values from Different Anchoring Methods

Country	TTO Anchoring	EQ-VAS Anchoring	CWD Anchoring
UK	0.230	0.289	N/A
Australia	N/A	0.488	-0.030

Abbreviations: CWD, Comparisons with death; VAS, visual analogue scale; TTO, time trade-off

- For the Australian sample, the different anchoring methods generated markedly different interim value sets – the values for the 'PITS state' were 0.488 and -0.030 for the EQ-VAS and CWD anchoring methods
- These differences may be driven by some counterintuitive responses to the EQ-VAS and CWD questions; e.g. the mean values for the EQ-VAS questions on perfect health, the 'PITS state' and death in this population were 67, 39 and 18
- 27% of respondents gave one or more illogical responses to the CWD questions

Table 3 - Results from DCE models

WAItE dimension and level [a]	UK			Australia		
	Latent Coeff	Rescaled (EQ-VAS)	Rescaled (TTO)	Latent Coeff	Rescaled (EQ-VAS)	Rescaled (CWD)
Tired2	-0.360	-0.058	-0.063	-0.341	-0.069	-0.132
Tired3	-0.360	-0.058	-0.063	-0.341	-0.069	-0.132
Tired4	-0.360	-0.058	-0.063	-0.341	-0.069	-0.132
Tired5	-0.859	-0.139	-0.150	-0.577	-0.117	-0.245
Walking2	-0.120	-0.019	-0.021	-0.074	-0.015	-0.028
Walking3	-0.120	-0.019	-0.021	-0.127	-0.026	-0.030
Walking4	-0.300	-0.048	-0.052	-0.275	-0.056	-0.097
Walking5	-0.615	-0.099	-0.108	-0.405	-0.082	-0.139
Sports2	-0.117	-0.019	-0.020	-0.045	-0.009	-0.011
Sports3	-0.117	-0.019	-0.020	-0.045	-0.009	-0.011
Sports4	-0.117	-0.019	-0.020	-0.045	-0.009	-0.011
Sports5	-0.347	-0.056	-0.061	-0.125	-0.025	-0.056
Concen2	-0.062	-0.010	-0.011	-0.018	-0.004	-0.009
Concen3	-0.265	-0.043	-0.046	-0.018	-0.004	-0.009
Concen4	-0.379	-0.061	-0.066	-0.143	-0.029	-0.069
Concen5	-0.707	-0.114	-0.124	-0.256	-0.052	-0.095
Embarassed2	-0.041	-0.007	-0.007	-0.181	-0.037	-0.080
Embarassed3	-0.126	-0.020	-0.022	-0.181	-0.037	-0.080
Embarassed4	-0.312	-0.050	-0.055	-0.279	-0.056	-0.116
Embarassed5	-0.398	-0.064	-0.070	-0.374	-0.076	-0.165
Unhappy2	-0.016	-0.003	-0.003	-0.062	-0.013	-0.028
Unhappy3	-0.218	-0.035	-0.038	-0.083	-0.017	-0.027
Unhappy4	-0.410	-0.066	-0.072	-0.315	-0.064	-0.139
Unhappy5	-0.822	-0.133	-0.144	-0.429	-0.087	-0.181
Treated2	-0.060	-0.010	-0.011	-0.025	-0.005	-0.017
Treated3	-0.198	-0.032	-0.035	-0.079	-0.016	-0.017
Treated4	-0.437	-0.071	-0.077	-0.251	-0.051	-0.096
Treated5	-0.650	-0.105	-0.114	-0.362	-0.073	-0.150

[a] Inconsistencies were observed for several dimensions in both the UK and Australian samples - some levels were combined to ensure monotonicity within all dimensions
Abbreviations: CWD, Comparisons with death; VAS, visual analogue scale; TTO, time trade-off; WAItE, weight-specific adolescent instrument for economic evaluation

Discussion & Conclusion

- Interim value sets for the WAItE in the UK and Australian populations have been generated
- Inconsistencies in responses were found in both populations, indicating that respondents were not able to differentiate between the less severe levels for some dimensions
- For the UK value set, the TTO and EQ-VAS anchoring methods produced similar results
- This value set will be used to generate utility scores from the WAItE in the MapMe2 randomised controlled trial taking place in the UK, due to be published in 2024
- For the Australian value set, the EQ-VAS and CWD anchoring methods produced markedly different results, likely driven by some counterintuitive responses to both the EQ-VAS and CWD anchoring questions
- Future analyses of the Australian data will further investigate counterintuitive responses to the EQ-VAS and CWD anchoring questions
- The UK and Australian value sets for the WAItE display several similarities, yet the values for the 'PITS state' are not comparable

References

- Webb, E.J., O'Dwyer, J., Meads, D., Kind, P. and Wright, P., 2020. Transforming discrete choice experiment latent scale values for EQ-5D-3L using the visual analogue scale. The European Journal of Health Economics, 21, pp.787-800.
- Krabbe, P.F., Jabrayilov, R., Detzel, P., Dainelli, L., Vermeulen, K.M. and van Asselt, A.D., 2020. A two-step procedure to generate utilities for the Infant health-related Quality of life Instrument (IQI). PLoS One, 15(4),

Contact
Tomos Robinson
Tom.Robinson@newcastle.ac.uk

This work was funded by the National Institute of Health and Care Research (NIHR) as part of the MapMe2 study and Newcastle University.

Find out more at putassoc.com