

# Trinidad & Tobago and the English Speaking Caribbean Recent Experience with EQ-5D

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## Caribbean Reality



- Context:
- Small Health Systems in the Caribbean:
  - Highly Centralized resource allocation decision making
  - Services provided by gov't owned facilities: no user charges
  - Line Item Historical Budgeting
  - Hostility towards explicit prioritization
- Build awareness, acceptance and use of explicit prioritization methods and tools in the Caribbean.
- For EQ-5D:
  - Small sample, low cost valuation studies
  - Disseminate & build interest using local studies/local forums

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## Valuation Studies

- Trinidad & Tobago: 3L Valuation
  - Pilot studies: 2009-2012
    - Orthogonal DCE design & VAS
    - D-Efficient DCE & VAS
  - Final Valuation Study Completed in 2015
  - 307 Respondents: Bayesian DCE w/ TTO for rescaling
- Develop small 3L value sets, build interest in CUA and move on to:
  - Pop Norm studies
  - 3L studies in other islands
  - 5L studies



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## Toward Explicit Prioritization for the Caribbean: An EQ-5D Value Set for Trinidad and Tobago



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### ABSTRACT

**Background:** Resource allocation decision making in the Caribbean can be greatly enhanced by the introduction of cost per quality-adjusted life-year (QALY) analysis on the basis of local preferences. In the valuation literature there have been recommendations for the elicitation methods of the EuroQol five-dimensional questionnaire (EQ-5D) that combine discrete-choice experiment (DCE) for bulk valuation with a time trade-off component for rescaling. **Objectives:** To create a three-level EQ-5D value set for Trinidad and Tobago using an elicitation method that takes into account the local constraints, and that can be easily deployed in other Caribbean islands. **Methods:** A D-efficient DCE was completed by a representative sample of 307 adults. A time trade-off procedure was used to obtain values for rescaling the DCE model on a scale anchored at 0 (dead) and 1 (full

health). **Results:** A mixed logit analysis of the DCE data produced an internally valid model that is similar to the results obtained in earlier pilot studies. **Conclusions:** This EQ-5D value set allows cost per QALY analyses to be carried out on the basis of preferences from Trinidad and Tobago, and the approach to the DCE design can be taken for similar value sets to be created in the small, resource-constrained health systems of the Caribbean. Some guidelines for the initial application and introduction of cost per QALY analysis into the Trinidad and Tobago health system are also presented. **Keywords:** Caribbean, discrete-choice experiment, EQ-5D, prioritization.

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# Discrete Choice Experiment

Pair #1:

Some problems with walking about  
 Some problems bathing or dressing self  
 Some problems with performing usual activities (e.g. work, study, housework, family or leisure activities)  
 No pain or discomfort  
 Moderately anxious or depressed

No problems with walking about  
 No problems bathing or dressing self  
 Some problems with performing usual activities (e.g. work, study, housework, family or leisure activities)  
 Moderate pain or discomfort  
 Moderately anxious or depressed

Pair #2:

No problems with walking about  
 No problems bathing or dressing self  
 Some problems with performing usual activities (e.g. work, study, housework, family or leisure activities)  
 No pain or discomfort  
 Extremely anxious or depressed

Some problems with walking about  
 No problems bathing or dressing self  
 Some problems with performing usual activities (e.g. work, study, housework, family or leisure activities)  
 Extreme pain or discomfort  
 Moderately anxious or depressed

DCE Design:

How many pairs to include?  
 Which states?

## Which States to include?

- Minimize number of pairs
- Avoid implausible combinations:
  - E.g. “Confined to bed” with “No problems” on SC or UA
- Degrees of freedom (=Rows) to allow models that account for respondent heterogeneity.
- Allow for TTO elicitation alongside DCE
- D-Efficient DCE design
  - Minimize determinant of the AVC Matrix:

$$\Omega_N(X, Y, \tilde{\beta}) = -[E(I_N(X, Y, \beta))]^{-1} = \left( \frac{\partial^2 L_N(X, Y, \tilde{\beta})}{\partial \beta \partial \beta} \right)^{-1}$$

$$D_p\text{-error} = \det(\Omega_1(X, \tilde{\beta}))^{1/H}$$

## DCE design & elicitation

$$\Omega_N(X, Y, \tilde{\beta}) = -[E(I_N(X, Y, \beta))]^{-1} = \left( \frac{\partial^2 L_N(X, Y, \tilde{\beta})}{\partial \beta \partial \beta} \right)^{-1}$$

$$D_p\text{-error} = \det(\Omega_1(X, \tilde{\beta}))^{1/H}$$

$$f_{x_i}(\beta) = \frac{\exp(\beta_i X_{i,x_i})}{\sum_{j=1}^J \exp(\beta_j X_{i,j})}$$

$$P_{x_i} = \int L_{x_i}(\beta) f(\beta | \theta) d\beta$$

11332	23211
23233	32321
11122	12521
13221	21313
12313	21132
23332	32211
13313	22231
12121	21213
21321	12133
22111	11222
11231	22122
22222	11333
32212	23333
33331	33223
21123	12212
12222	11131
21223	13312
32333	33322
22312	13223
33212	22333

PAIR 1	CHOICE A	CHOICE B
	No problems with walking about Some problems with bathing or dressing self Severe problems with performing usual activities (e.g. work, study, housework, family or leisure activities) Moderate pain or discomfort Moderately anxious or depressed	No problems with walking about No problems with self-care No problems with performing usual activities (e.g. work, study, housework, family or leisure activities) Extreme pain or discomfort Not anxious or depressed
PAIR 2	CHOICE A	CHOICE B
	Severe problems with walking about No problems with self-care Severe problems with performing usual activities (e.g. work, study, housework, family or leisure activities) Moderate pain or discomfort Extremely anxious or depressed	No problems with walking about Unable to bathe or dress self Unable to perform usual activities (e.g. work, study, housework, family or leisure activities) No pain or discomfort Moderately anxious or depressed

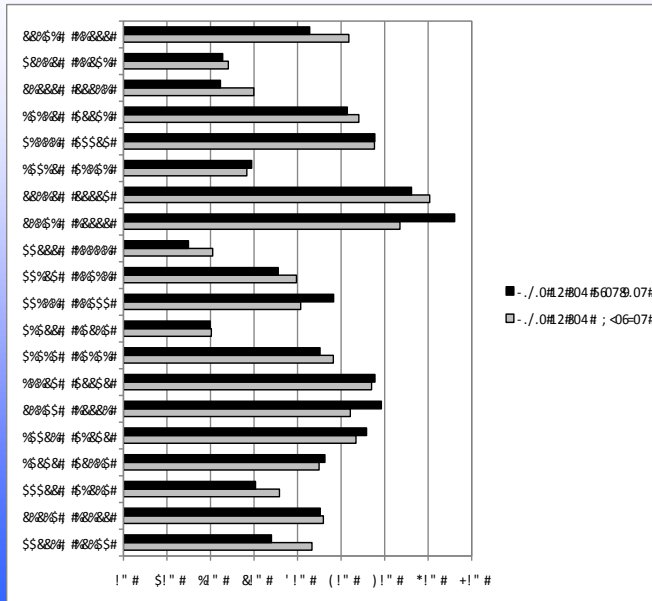
# Sample

	N	Sample %	Trinidad and Tobago %
Male	155	50%	51%
Female	152	50%	49%
	307	100%	100%
<b>Ethnicity</b>			
Indo-Trinidadian	113	37%	39%
Afro-Trinidadian	136	44%	39%
Mixed/Other	58	19%	22%
	307	100%	100%
<b>Age Group</b>			
18-24	49	16%	19%
25-34	78	25%	22%
35-44	64	21%	22%
45-54	50	16%	16%
55-64	33	11%	10%
65+	33	11%	10%
	307	100%	100%
<b>Education</b>			
Primary or less	68	22%	28%
Secondary	146	48%	49%
University	54	18%	11%
Tech/Vocational	39	13%	12%
	307	100%	100%
<b>RHA Area</b>			
NorthWest RHA	61	20%	24%
SouthWest RHA	123	40%	41%
North Central RHA	79	26%	23%
Tobago RHA	15	5%	4%
Eastern RHA	29	9%	8%
	307	100%	100%

# Results

	<b>Coeff</b>	<b>St Err</b>	<b>P-Val</b>	<b>95% Conf. Interval</b>	
<b>Means</b>					
M02	-0.301	0.068	0.000	-0.434	-0.168
M03	-2.770	0.259	0.000	-3.278	-2.262
SC2	-0.431	0.065	0.000	-0.558	-0.304
SC3	-1.155	0.115	0.000	-1.380	-0.930
UA2	-0.291	0.066	0.000	-0.420	-0.162
UA3	-0.789	0.092	0.000	-0.969	-0.608
PD2	-0.432	0.057	0.000	-0.543	-0.321
PD3	-1.544	0.121	0.000	-1.782	-1.307
AD2	-0.077	0.047	0.103	-0.169	0.016
AD3	-0.938	0.077	0.000	-1.090	-0.786
<b>Standard Deviations</b>					
M02	0.335	0.064	0.000	0.209	0.461
M03	1.636	0.189	0.000	1.266	2.006
SC2	0.201	0.098	0.040	0.009	0.393
SC3	0.562	0.080	0.000	0.404	0.719
UA2	0.025	0.069	0.719	-0.111	0.161
UA3	0.251	0.085	0.003	0.085	0.418
PD2	0.101	0.159	0.525	-0.210	0.413
PD3	0.807	0.069	0.000	0.671	0.943
AD2	-0.145	0.102	0.154	-0.344	0.054
AD3	0.609	0.063	0.000	0.485	0.733
Observations	12280			LR chi Sq(10)	339.95
Log likelihood	-3821.485			Prob > Chi Sq	0.000

# Model vs Observed Choices



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## T&T Valuation Study

	Coeff	St Err
<b>Means</b>		
MO2	-0.301	0.068
MO3	-2.770	0.259
SC2	-0.431	0.065
SC3	-1.155	0.115
UA2	-0.291	0.066
UA3	-0.789	0.092
PD2	-0.432	0.057
PD3	-1.544	0.121
AD2	-0.077	0.047
AD3	-0.938	0.077
<b>Standard Deviations</b>		
MO2	0.335	0.064
MO3	1.636	0.189
SC2	0.201	0.098
SC3	0.562	0.080
UA2	0.025	0.069
UA3	0.251	0.085
PD2	0.101	0.159
PD3	0.807	0.069
AD2	-0.145	0.102
AD3	0.609	0.063
Observations	12280	
Log likelihood	3821.485	
LR chi Sq(10)	339.95	
Prob > Chi Sq	0.0000	



State	11121	33333
DCE Value	-0.432	-7.196
TTO Value	8.43	-1.63

Constant	-0.0930
MO2	-0.045
MO3	-0.412
SC2	-0.064
SC3	-0.172
UA2	-0.043
UA3	-0.117
PD2	-0.064
PD3	-0.230
AD2	-0.011
AD3	-0.139

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## Response & Applications

- Renal Study 1.
  - Bailey, Laptiste, LaFoucade
  - 175 Dialysis Pts w/matching cohort from general public.
  - Data collected
  - Model for Transplant Pts.
  - Shows ICER for transplant ~ US\$ 1830/QALY
  - Renal dialysis CER ~ US\$ 55.4k/QALY

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## Applications

- Renal Study 2.
  - Sanchez, Teelucksingh, Bailey et al
  - 200 Dialysis Pts and 140 Transplant pts
  - Data coll & analysis ongoing.

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## Applications:

- Diabetic Foot Ulcer Study
- Sumpio, Naraynsingh, Bailey, et al.
- “Cultural tolerance” in diabetic foot ulcer patients from the Caribbean (T&T; B’dos) compared with diabetic ulcer patients in the US.
  - EQ-5D;
  - Norfolk Neuropathy QOL Inst
  - Diabetic Foot Ulcer Scale
- Diabetic Pt w/ F-U vs w/o F-U in USA vs Caribbean.
- Data Coll 4<sup>th</sup> Qtr 2015/1<sup>st</sup> Qtr 2016.

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## Applications

- EQ-5D and Work Arrangements:



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Short communication

### Health and entrepreneurship in four Caribbean Basin countries

Cornelius A. Rietveld <sup>a, b, c, d, e</sup>, Henry Bailey <sup>c, d</sup>, Jolanda Hessels <sup>a, e</sup>, Peter van der Zwan <sup>a, e</sup>

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## Applications

### Health Status and Work Arrangements

- Health and entrepreneurship in four Caribbean Basin countries (N=9,500).
- Rietveld, Bailey, Hessels, van der Zwan (2016)
  - Included EQ-5D and EQ-VAS in a Survey covering work arrangements
  - SRH for business owners and wage workers
  - Binary Logit model:
    - ◆ Business owners are ‘healthier’ than wage workers
    - ◆ +ve, significant correl between SRH and entrep. perceptions among wage workers: F-O-F, Conf/Skill; Perceived Opps.
    - ◆ Healthier entrepreneurs have higher growth expectations.

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## Applications:

### Pop Norm Studies 2017

#### 2017

- T&T
- 2k respondents

#### 2018

- Barbados
- 2k respondents
  
- Jamaica
- 2k respondents

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## Applications:

### NESTT 2017-2018

- B-O-D Study:
  - 8k respondents Eye- health study
  - Requested 5L: created crosswalk
- CUA of ophthalmic & optometry interventions
  - 3.6k respondents

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## Applications:

### TTMA Presentations

- 2015 EQ-5D T&T Valuation Study & Renal Study
- 2016 PRO Methods: The Voice of the Patient
- 2017 EQ-5D and Obesity in T&T
- Other:
  - Jamaica haemophilia study
  - Barbados Diabetes QoL w/EQ-VAS

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