# Comparing Generic and Cancer-Specific Preference-Based Measures in the Cancer Patient Journey

A. Simon Pickard,<sup>1,2</sup> Juan M. Ramos-Goñi,<sup>2</sup> James W. Shaw,<sup>1,3</sup>

<sup>1</sup>University of Illinois - Chicago, USA; <sup>2</sup>Maths in Health BV, The Netherlands; <sup>3</sup>Bristol Myers Squibb, USA.

# BACKGROUND

- Health-related quality of life (HRQL) is critically important to understanding outcomes of cancer treatment and long-term survivorship issues
- The EQ-5D has been the de facto measure of health used to facilitate the calculation of quality adjusted life years, but with the recent development of the QLU-C10D and FACT-8U as well as the emergence of the generic EQ-HWB and CS-Base, there is significant interest in comparing the content of these measures for the purpose of capturing the cancer patient journey

# OBJECTIVES

# Figure 1a. Agreement between measures based on PRO-based clusters

 When agreement between PRO-based clusters was compared, the highest agreement was between CSbase/EQ-5D (ICC=0.73) and CSbase/HWB (ICC=0.72) (Figure 1a), which

PCR2

# RESULTS

- The overall goal of this study was to compare the ability of different prominent and emerging measures of HRQL to capture the impact cancer
- The specific objective was to compare the content of the various measures based on the ability to predict severity of cancer status and level of functioning

# METHODS

#### Participants:

- A cross-sectional panel of cancer patients were recruited to complete an online survey consisting of generic and disease-specific measures.
- Respondents were incentivized to upload proof of diagnosis; cancer subtypes were capped at <80; 40% of respondents uploaded confirmation of cancer diagnosis</li>
   Measures:
- EQ-5D-5L. Includes 5 dimensions of health (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) each with 5 levels of problems
- EQ-HWB-S. Developed as a measure intended to broadly guide the allocation of resources across health and social care, the EQ-Health and Well-being Short Form (EQ-HWB-S) covers aspects of health included in the EQ-5D, and additionally aspects of social care such as coping/control
- QLU-10D. Based on a subset of items from the EORTC QLQ-C30, one of the main cancer specific measures of health-related quality of life used in clinical trials
- **FACT-8D**. Based on items from the FACT-G, one of the main cancer specific measures
- Chateau Sante Base (CS-Base). A recently developed measure that includes aspects of social care beyond health care such as self-reliance as well as physical and mental well-being

Analysis:

Cluster analysis was used to explore the predictive ability of the different measures to classify patients based on clinical severity including: 1) ECOG performance status; 2) cancer progression status, and 3) self-rated overall health using EQ-VAS scores (quintiles)
Clusters for each measure were sequentially compared to all other measures (e.g. EQ-5D-5L, EQ-HWB, FACT-8U, QLU-C10D, CS-Base), identifying four or five clusters depending on response structure of PRO measure, then ordered by severity of index value or level-sum score



Figure 1b. Agreement between PRO-based clusters and other criteria (ECOG, cancer status, VAS)



Cancer status
VAS Rating Ranges
ECOG performance status grade

- Cancer status poorly agreed with PRO content based clusters (ICCs 0.13 to 0.20)
- Similar agreement when comparing groups based on VAS quintile and PROcluster (ICCs 0.48 to 0.53)
- Agreement between ECOG status and PRO-based clusters was weakest with EQ-HWB (ICC=0.35) and strongest with EQ-5D-3L (ICC=0.56)

• When using cancer status as a

efficiency, cancer-disease

basis for comparing statistical

specific PBMs (QLU-C10D and

FACT-8D) performed best (Table

• ICCs were used to assess agreement between classification of patients by clinical severity (e.g. ECOG) and the clustering by a measure, e.g. EQ-5D

### RESULTS

- Of 520 respondents that completed the surveys, nearly half were male (47%) and 52% were female (Table 1), with the most common types of cancer reported were breast, colorectal, lung, and prostate
- Only a small proportion had serious functional limitations based on the ECOG scale (level 3 or 4). Nearly 20% reported progression in cancer, while 40% were in complete remission

#### Table 1. Respondent characteristics

		Gender			
	Male (%)	Female (%)	Other (%)	Total (%)	
Total	246 (47.31)	273 (52.5)	1 (0.19)	520 (100)	
Age					
20-29	7 (1.35)	18 (3.46)	0 (0)	25 (4.81)	
30-39	32 (6.15)	37 (7.12)	0 (0)	69 (13.27)	
40-49	47 (9.04)	68 (13.08)	0 (0)	115 (22.12)	
50-59	54 (10.38)	72 (13.85)	0 (0)	126 (24.23)	
60-69	57 (10.96)	50 (9.62)	1 (0.19)	108 (20.77)	
70+	49 (9.42)	28 (5.38)	0 (0)	77 (14.81)	
Cancer type					
Bladder Cancer	7 (1.35)	2 (0.38)	0 (0)	9 (1.73)	
Breast Cancer	2 (0.38)	74 (14.23)	0 (0)	76 (14.62)	
Colon or Rectal Cancer	21 (4.04)	37 (7.12)	0 (0)	58 (11.15)	
Cervical Cancer	2 (0.38)	17 (3.27)	0 (0)	19 (3.65)	
Endometrial or Uterine Cancer	9 (1.73)	14 (2.69)	0 (0)	23 (4.42)	
Kidney Cancer	7 (1.35)	6 (1.15)	0 (0)	13 (2.5)	
Leukemia	13 (2.5)	10 (1.92)	0 (0)	23 (4.42)	
Liver Cancer	7 (1.35)	3 (0.58)	0 (0)	10 (1.92)	
Lung Cancer	39 (7.5)	22 (4.23)	0 (0)	61 (11.73)	
Melanoma	19 (3.65)	12 (2.31)	0 (0)	31 (5.96)	
Multiple Myeloma	7 (1.35)	3 (0.58)	1 (0.19)	11 (2.12)	
Lymphoma	13 (2.5)	15 (2.88)	0 (0)	28 (5.38)	
Pancreatic Cancer	1 (0.19)	1 (0.19)	0 (0)	2 (0.38)	
Prostate Cancer	76 (14.62)	0 (0)	0 (0)	76 (14.62)	
Thyroid Cancer	2 (0.38)	8 (1.54)	0 (0)	10 (1.92)	
Ovarian Cancer	0 (0)	25 (4.81)	0 (0)	25 (4.81)	
Other	21 (4.04)	24 (4.62)	0 (0)	45 (8.65)	
ECOG					
Fully active	88 (16.92)	94 (18.08)	0 (0)	182 (35)	
Restricted in strenuous activity	95 (18.27)	113 (21.73)	0 (0)	208 (40)	
Ambulatory/capable of selfcare but	49 (9.42)	51 (9.81)	1 (0.19)	101 (19.42)	
unable to work				24 (4 (2)	
Capable of only limited selfcare	11(2.12)				
Completely disabled	3 (0.58)	2 (0.38)		5 (0.96)	
Cancer status					
Progression	59 (11.35)	41 (7.88)	1 (0.19)	101 (19.42)	
Partial remission	65 (12.5)	64 (12.31)	0 (0)	129 (24.81)	
Complete remission	91 (17.5)	118 (22.69)	0 (0)	209 (40.19)	
Recurrence	19 (3.65)	32 (6.15)	0 (0)	51 (9.81)	
Don't know	12 (2.31)	18 (3.46)	0 (0)	30 (5.77)	

Table 2. Statistical Efficiency based on Mean Scores of PBMs using Known Groups Comparisons based on ECOG status, cancer status, and VAS range

	EQ-5D-3L	EQ-HWB	FACT-8D	EORTC	CS-Base
Cancor status				QLU-C10D	
Complete remission (1)	0.65	0.66	0.60	0.57	0.96
Complete remission (1)	0.05	0.00	0.60	0.37	0.00
Partial remission (2)	0.57	0.58	0.53	0.48	0.84
Recurrence (3)	0.54	0.60	0.48	0.46	0.84
Progression (4)	0.49	0.50	0.43	0.39	0.81
Mean difference 1 vs 4	0.16	0.16	0.18	0.19	0.06
F-value	6.11	7.64	10.77	12.74	8.67
Relative efficiency ratio	1	1.25	1.76	2.09	1.42
ECOG					
Fully active (0)	0.82	0.78	0.71	0.71	0.91
Restricted strenous activities (1)	0.60	0.59	0.52	0.47	0.84
Ambulatory, can selfcare but unable	0.24	0.40	0.07	0.20	0.77
to work activities (2)	0.31	0.42	0.37	0.30	0.77
Limited selfcare (3)	0.03	0.16	0.15	0.17	0.71
Mean difference 0 vs 3	0.79	0.62	0.56	0.54	0.20
F-value	147.28	88.67	78.97	118.18	100.52
Relative efficiency ratio	1	0.60	0.54	0.80	0.68
VAS Range					
[80,100]	0.84	0.83	0.77	0.74	0.93
[60,79]	0.65	0.65	0.57	0.54	0.86
[40,59]	0.48	0.52	0.45	0.40	0.81
[20,39]	0.32	0.35	0.30	0.27	0.76
[0,19]	0.13	0.22	0.16	0.18	0.70
Mean difference	0.71	0.61	0.61	0.57	0.23
F-value	63.55	77.58	71.97	70.3	71.25
Relative efficiency ratio	1	1.22	1.13	1.11	1.12

#### Conclusions

- When using a measure of functional status (ECOG) as the basis for KGC, EQ-5D performed best (yellow highlight), and had largest mean difference scores.
  PBMs demonstrated similar statistical efficiency when using VAS-score based groups, with the HWB slightly better
  Using F-stats, ECOG had strongest ability to differentiate HRQL, while cancer status was a poor basis for KGC, consistent with Fig 1b
- Based on levels of agreement with both external clinical anchors and existing, well-established PRO measures used in cancer, newer measures such as the EQ-HWB and CS-Base appeared to perform well. No measure was consistently better than the others
- In considering different PBMs for capturing the cancer patient journey, results showed that it depends on the criteria used, with generic PBMs tended to perform comparatively better using

functional criteria, while disease-specific PBMs tend to perform better in the context of cancer status, suggesting a strategy uses both disease-specific and a generic PBM measure may be preferable

• Cancer status and functional performance status and overall self-rated health were used as the basis for comparison in this study. Future research could examine other anchors as a basis for comparison to better understand the strengths and limitations of PBMs for various cancer subgroups

#### References

- 1. Herdman M, Gudex C, Lloyd A, Janssen M, Kind P, Parkin D, et al. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). Qual Life Res. 2011;20(10):1727-36.
- 2. Brazier J, Peasgood T, Mukuria C, Marten O, Kreimeier S, Luo N, et al. The EQ-HWB: Overview of the Development of a Measure of Health and Wellbeing and Key Results. Value Health. 2022;25(4):482-91.
- 3. Monteiro AL, Kuharic M, Pickard AS. A Comparison of a Preliminary Version of the EQ-HWB Short and the 5-Level Version EQ-5D. Value Health. 2022;25(4):534-43.
- 4. Krabbe PFM, van Asselt ADI, Selivanova A, Jabravilov R, Vermeulen KM. Patient-Centered Item Selection for a New Preference-Based Generic Health Status Instrument: CS-Base. Value Health. 2019;22(4):467-73.
- 5. King MT, Costa DS, Aaronson NK, Brazier JE, Cella DF, Fayers PM, et al. QLU-C10D: a health state classification system for a multi-attribute utility measure based on the EORTC QLQ-C30. Qual Life Res. 2016;25(3):625-36.
- 6. King MT, Norman R, Mercieca-Bebber R, Costa DSJ, McTaggart-Cowan H, Peacock S, et al. The Functional Assessment of Cancer Therapy Eight Dimension (FACT-8D), a Multi-Attribute Utility Instrument Derived From the Cancer-Specific FACT-General (FACT-G) Quality of Life Questionnaire: Development and Australian Value Set. Value Health. 2021;24(6):862-73.

#### Acknowledgments

• BMS for provided funding support and Survey Engine GMH helped to recruit participants and host the survey

• We are grateful to the cancer survivors who participated