

Identifying the most effective multi-attribute utility instruments to guide cancer funding decisions in Canada

Helen McTaggart-Cowan^{1,2}, Stuart J. Peacock^{1,2,3}, Kelvin Chan^{1,4}, Daniel Costa⁵, Jeffrey Hoch⁶, Madeleine King⁵, Natasha Leighl⁷, Nicole Mittmann⁸, Richard Norman⁹, A. Simon Pickard¹⁰, Dean A. Regier^{1,2,11}, and Rosalie Viney¹²

¹Canadian Centre for Applied Research in Cancer Control; ²Department of Cancer Control Research, British Columbia Cancer Agency; ³Faculty of Health Sciences, Simon Fraser University; ⁴Sunnybrook Health Sciences Centre; ⁵Department of Psychology, University of Sydney; ⁶Department of Public Health Sciences, University of California, Davis; ⁷Princess Margaret Cancer Centre; ⁸Cancer Care Ontario; ⁹School of Public Health, Curtin University; ¹⁰Departments of Pharmacy Practice and Pharmacy Administration, University of Illinois, Chicago; ¹¹School of Population and Public Health, University of British Columbia; ¹²Centre for Health Economics Research and Evaluation, University of Technology, Sydney

Introduction

The cost of new cancer therapies is rising dramatically. Many jurisdictions, including Canada, recommend the use of cost-utility analysis (CUA), in which quality-adjusted life years (QALYs) are used to measure and value treatment impacts. The QALY combines information about quality of life (QOL), measured in terms of utility, as well as survival. Generic utility instruments are often used to measure general population preferences for hypothetical health states but they tend to be insensitive because they often lack key features of the disease under investigation.

The QLQ-C30 and the FACT-G are two most commonly used cancer-specific QOL measures to assess treatment effectiveness. However, because these instruments do not provide information about strength of preference for particular dimensions of QOL or about the trade-off between QOL and survival, they serve as a description rather than a valuation of health and therefore cannot be used to estimate QALYs. Recently, the Multi-attribute Utility in Cancer (MAUCA) Consortium have developed two internationally valid cancer-specific multi-attribute utility instruments based on the QLQ-C30 and the FACT-G – the QLU-C10D and the FACTU-8D, respectively^{1,2}.

The proposed study will aim to:

- (1) determine the Canadian-based population utility weights using the responses on the QLU-C10D and the FACTU-8D; and
- (2) apply the developed Canadian utility weights to pre-existing cancer clinical trial data.

Methods

Phase 1: Canadian cancer-specific utilities

An online panel of participants will value either the QLU-C10D or the FACTU-8D health state classification systems by using a discrete choice experiment (DCE). The participants will be selected to ensure that their demographic characteristics are representative of the Canadian general population. Participants will also complete the QLQ-C30 or the FACT-G, depending on which DCE version was administered.

Different modelling approaches (e.g., mixed logit, generalized multinomial logit) will be explored in the DCE analysis to account for repeated measures and for individual heterogeneity. By taking the ratio of the marginal utilities between the investigated health state and full health, a utility weight for a health state will be estimated.

Example of QLU-C10D DCE choice set

	Situation A	Situation B
In taking a long walk	You have no trouble	You have no trouble
In taking a short walk	You have no trouble	You have no trouble
You are limited in pursuing your work or other daily activities	Very much	Very much
Your physical condition or medical treatment interferes with your social or family life	Very much	Not at all
You feel worried	Quite a bit	Quite a bit
You have pain	Quite a bit	A little
You feel tired	A little	A little
You have trouble sleeping	Not at all	Not at all
You lack appetite	Quite a bit	Quite a bit
You feel nauseated	A little	Quite a bit
You have constipation or diarrhea	Very much	Quite a bit
You will live in this health state for	1 year, and then die	2 years, and then die
Which situation would you prefer?	<input type="radio"/> Choose this?	<input type="radio"/> Choose this?

Example of FACTU-8D DCE choice set

	Situation A	Situation B
Pain	Somewhat	Very much
Fatigue	A little bit	A little bit
Nausea	None	None
Problems sleeping	Quite a bit	None
Problems doing work (including work at home)	Somewhat	Very much
Problems with support from my family and/or friends	Quite a bit	Quite a bit
Sadness	A little bit	A little bit
Worry my health condition will get worse	Somewhat	None
You will live in this health state for	1 year, and then die	5 years, and then die
Which situation would you prefer?	<input type="radio"/> Choose this?	<input type="radio"/> Choose this?

Phase 2: Performances of QLU-C10D and FACTU-8D

The calculated Canadian population-based utility weights for both the QLU-C10D and the FACTU-8D will then be applied to pre-existing datasets consisting of QLQ-C30 and FACT-G responses available from the National Cancer Institute of Canada – Clinical Trials Group. This will allow us to retrospectively conduct CUA for cancer trials that were missing utility information. For trials that have included generic utility measures, the existing CUAs will be compared with the newly generated CUAs; this will enable us to determine whether or not the generic measures underestimated the benefits of cancer treatments.

The following tests will be conducted in order to enable us to determine the most effective measures to generate cancer-specific utilities for use in CUA:

- The ability of each instrument to discriminate between groups of patients
- The relative efficiency of two instruments to discriminate between groups of patients
- The ability of each instrument to discriminate across changes over time
- The distribution of the utilities for each dimension of each instrument
- The correlations between the cancer-specific and generic utility instruments
- The minimal clinically important differences for the QLU-C10D and the FACT-8D

Significance to cancer research

The proposed research will aim to improve the effectiveness and efficiency of Canadian cancer care. By obtaining Canadian population-based utility weights for two of the most widely used cancer-specific QOL instruments, more sensitive information regarding burden and QOL will be elicited to improve cancer patient outcomes. Canadian cancer-specific utility weights will enable comparative evaluation of novel and existing cancer treatments; this will be important as CUA can be calculated for retrospective clinical trials that only included QLQ-C30 and FACT-G information.

References

- King MT 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): 625-636.
- Norman R et al. Using a discrete choice experiment to value the QLU-C10D: feasibility and sensitivity to presentation format. Qual Life Res 2016; 25(3): 637-49.