Q&A

Discrete Choice Experiment Methods:
An Interview with F. Reed Johnson, PhD

Our editorial board member for Value & Outcomes Spotlight was fortunate to sit down with F. Reed Johnson, PhD, Senior Research Scholar at Duke University’s Clinical Research Institute, to discuss patient-reported outcomes and discrete choice experiment methods. His current research involves quantifying patients’ willingness to accept side effect risks in return for therapeutic benefits and estimating general time equivalences among health states. He led the first FDA sponsored study on patients’ willingness to accept benefit-risk tradeoffs for new health technologies. The study was used to develop recent FDA guidance on submitting patient-preference data to support regulatory reviews of medical devices.

Value & Outcomes Spotlight: You are recognized as a leader in patient-reported outcomes (PROs) and especially in discrete choice experiment (DCE) methods. Could you describe the advantages and more common applications of DCE in health technology assessment (HTA)?

F. Reed Johnson: Choice experiments simulate decisions requiring respondents to evaluate a series of 2 or more experimentally constructed health interventions, health states, or health policies. The preference elicitation typically is a response to the question: “If these were the only alternatives available, which would you choose?” Under appropriate experimental controls and using appropriate statistical analysis, the pattern of such choices reveals respondents’ implicit relative-importance weights for the features used to describe the constructs of interest.

There is persistent confusion about the relationship between PROs and choice experiments. This confusion arises because both PROs and choice experiments obtain data by direct elicitation from individual patients. In fact, the 2 kinds of data share no common conceptual framework or intellectual history. Choice experiments do not collect outcomes data and PROs are not experiments.

If HTA is narrowly defined as cost-effectiveness analysis, choice experiments currently are not commonly used for such purpose. However, researchers are beginning to demonstrate use of choice-experiment data to quantify generalized healthy-time equivalents and to obtain patient-centric weights for aggregating items in value frameworks. Defining HTA more broadly as the systematic evaluation of health technology to inform decision making, choice experiments can be useful in all stages of the product life cycle, including prioritization in early product development, clinical-trial design, weighting clinical-trial data to obtain patient-relevant composite endpoints, regulatory benefit-risk assessments, value frameworks for market access, evidence reviews for clinical guidance, and shared decision making.

Do you consider DCE useful to be used in combination with multiple criteria decision analysis (MDCA) tools?

There also is persistent confusion about the relationship between MCDA and choice experiments. MCDA as typically implemented is a process to promote consensus and transparency in small-group decision making. Choice-experiment evidence could appropriately be included along with clinical-trial evidence and other considerations in supporting such deliberations.

How is the process of choosing and building of attributes and levels conducted? Is it essential to involve patients in that step? How much time and effort should be dedicated to this part of DCE?

Poor attribute identification and definition is the primary cause of limited relevance and high measurement error in DCE studies. Attributes and levels are defined using either top-down or bottom-up approaches, depending on the purpose of the study. If the study is intended to provide weights for trial-data composite endpoints or for benefit-risk assessments, then the attributes and levels must map directly to the trial endpoints to be evaluated. If the study is intended to identify and quantify outcomes and processes most salient to patients, then attributes and levels are obtained through a combination of existing evidence, clinical experience, and most critically, direct patient engagement.
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There is no established good-practice guidance for engaging patients in identifying salient attributes. Implementation can range from informal conversations with patients to a formal sub-study to prioritize a list of possible attributes. Many researchers advocate use of focus groups. Approaches can include direct ranking, card sorting, best-worst scaling, or Likert-scale exercises. Attributes and levels commonly are verified in face-to-face interviews used to evaluate draft instruments. Necessary effort to identify, define, and test attributes in survey development sometimes can require half of the resources available for a study.

Do you see, in a near future, DCE replacing traditional instruments for valuing technologies or as a tool for eliciting utilities?

I have been expecting that to happen in the “near future” for 20 years! As a young environmental economist in the 1980s, I saw stated-preference methods based on standard economic utility theory integrated into formal technology assessments in every area of applied economics requiring nonmarket valuation except health. There seemed to be no logical basis to treat health investments differently than investments in transportation, food safety, water management, pollution control (with health as the most significant benefit category), habitat protection, or homeland security. However, traditional HTA approaches have continued to enjoy widespread acceptance and enormous inertia. Recent emphasis on patient-centric healthcare, value frameworks, FDA guidance on submitting patient-preference data to support regulatory benefit-risk assessments, and studies to obtain DCE-based tariffs for EQ-5D health states finally indicate a significant sea change. I am hopeful that it will not take another 20 years before choice-experiment methods routinely are taught and used for valuing health technologies.

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