Studying preferences in health service delivery: the use of Discrete Choice Experiments

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Introduction

In order to build stronger health systems and make decisions on how to allocate scarce resources, policymakers often need data on:

- the preferences of health service providers (health care workers) in how, when and where they deliver services
- the preferences of health system clients regarding the type of services and programs that best suit their needs.

Discrete Choice Experiments (DCEs) are increasingly being discussed as a helpful data collection tool to provide such information. DCEs can be relatively quick and inexpensive (Lagarde and Blaauw 2009), and are particularly useful when research and policy questions arise that require understanding of people’s preferences, but for which no past data exists.

This paper is intended to provide an introduction to DCEs and their applications and limitations for senior health planners in government and development agencies.

Understanding what people want from their health system

Understanding the value people place on health-related products, services and policies is important for government and non-government policy-makers as well as health program designers and implementers. Such understanding can improve adherence to and uptake of policies and programs.

In many non-health fields, people’s preferences for products, services and policies are gained by observing consumption choices in “market places”. However, in the health sector people’s true preferences for goods and services cannot always be observed in a “market place”.

KEY MESSAGES

- DCEs analyse data on hypothetical choices people make to predict individual and population preferences in relation to a particular policy question. They are useful when real preferences cannot be observed or when a new type of service is under consideration.

- DCE applications already exist across a wide range of health policy issues including: how to attract and retain health workers; how patients, policy-makers and populations think resources should be allocated across health programs; what type of health insurance schemes people want; how much they will pay and what is the likely uptake; and how much money different health programs and services are worth to people.

- DCEs can be a relatively quick and cheap survey tool, but they require expertise in design and analysis.

Insurance and government schemes often mean people do not pay full costs for goods and services, so we do not know how much they are valued. Health workers also strongly influence choices people make. Further, some services and policies for which it might be useful to gauge people’s preferences might still be in a development stage (Lancsar and Louviere 2008). In such instances DCEs can help reveal people’s preferences to inform health program planning.

What is a Discrete Choice Experiment?

A DCE is a quantitative technique where people are asked, via a survey, to consider a series of scenarios where two or more hypothetical options are presented. They are asked to select the option they favour relative
to the other(s). Each option is described by a number of characteristics (known as “attributes”) believed to be important to people’s decision making. Respondents are asked to make a number of these hypothetical choices to build a quantitative picture of their preferences. For example, Figure 1 presents a hypothetical choice between alternative employment positions. Each alternative is described by the attributes: location, facility level, salary, training opportunities and social impact of the position. The levels of each attribute are varied across a set range to enable people to differentiate and state their preferred choice.

DCEs provide data on individual and population-level preferences for goods and services. Specifically they help research what community members or health workers value (the relative importance of different attributes) when making choices about health care. Socioeconomic factors and other individual characteristics are commonly collected to enable sub-group analyses of preferences. For example, which attributes are more important to men than women, or to poorer communities compared with wealthier ones.

**Examples of how DCEs have been applied in the health sector**

DCEs were initially developed for marketing and transport planning. In the last 20 years, however, the application to the health setting has increased. For example, Lagarde and Blaauw (2009) found 10 DCEs investigating job preferences of health workers in developed and developing countries and found they “are a valuable tool for informing decision-makers to design strategies to address human resources problems.”

There are a number of health policy issues where DCE research has been used. These include:

- how to attract and retain staff in rural settings
- what national and sub-national health managers believe should be the priority areas for investing limited health resources
- whether patients are prepared to pay (more) for higher quality medicines and services
- what the likely uptake of new health insurance schemes might be and what features would improve uptake.

**FIGURE 1 SAMPLE DCE CHOICE TASK: CONSIDER THE JOBS BELOW, WHICH WOULD YOU PREFER?**

**SEEKING Professional Nurse**

**Location:** OVERSEAS  
**Facility:** HOSPITAL  
**Salary:** R 325,000 per year

**Training opportunities offered:**
You will benefit from an interesting on-the-job in-service training.

**Social impact:**
You will help us provide quality clinical care to the population of our country.

For this position described above, you have learnt through your own investigation that:

- You may not be fully recognised as a professional nurse, and may sometimes be looked down on as a foreigner.
- There is NO lack of basic equipment, medical supplies or drugs.
- The hospital management is supportive of its staff.
- There is NO lack of basic equipment, medical supplies or drugs.

**PRIVATE HOSPITAL SEeks PROFESSIONAL NURSE**

**Location:** URBAN AREA  
**Facility:** HOSPITAL  
**Salary:** R 150,000 per year

**Training opportunities offered:**
5 days off/year and a 10% contribution to your fees will be provided to you for training.

**Social impact:**
Your presence will help us provide advanced care to our clients.

For this position described above, you have learnt through your own investigation that:

- There is NO lack of basic equipment, medical supplies or drugs.

**Exciting position available in the PUBLIC SECTOR for a Professional Nurse**

**Location:** RURAL AREA  
**Facility:** HOSPITAL  
**Salary:** R 132,000 per year (inc. R 12,000 for rural allowance)

**Training opportunities offered:**
You will be able to get study leave to specialise within 6 years.

**Social impact:**
Your presence will benefit populations who would otherwise have no access to essential services.

For this position described above, you have learnt through your own investigation that:

- You will benefit from an interesting on-the-job in-service training.
- There is NO lack of basic equipment, medical supplies or drugs.
- The hospital management is supportive of its staff.
- There is NO lack of basic equipment, medical supplies or drugs.

**PROFESSIONAL NURSE position in the PUBLIC SECTOR**

**Location:** URBAN AREA  
**Facility:** CLINIC  
**Salary:** R 144,000 per year

**Training opportunities offered:**
You will be able to get study leave to specialise within 6 years.

**Social impact:**
Your presence will benefit populations who would otherwise have no access to essential services.

For this position described above, you have learnt through your own investigation that:

- There is NO lack of basic equipment, medical supplies or drugs.
How to design a DCE so that it provides valid data on health policy and management questions

DCEs can only observe preferences to hypothetical choices. The validity of DCE results are enhanced when the scenarios and choices used in a survey are plausible. Experts agree it is important to conduct qualitative research of target populations to first determine which attributes are most important for them when making choices related to the policy area under investigation (Lancsar and Louviere 2008, Mangham et al 2009). Preliminary qualitative research and pilot testing of questionnaires has been found to be especially important in low-income country settings where education and literacy levels may be low (Mangham et al 2009).

There is debate around how many options and attributes people can cognitively cope with in a single hypothetical choice scenario. It is also difficult to know with certainty whether people’s choices would be the same in real life situations. Researchers try to test whether the choices a respondent makes across multiple choice scenarios are rational and consistent, though rationality can be difficult to define and assess (Lancsar and Louviere 2008).

The internal validity of a DCE study is usually assessed against how satisfactorily economic theory can explain a study’s results. Assessing external validity of DCEs is difficult, as it generally requires comparing DCE results with observations of choices in real markets, which of course usually do not exist and are the reason for conducting a DCE in the first place.

Internal validity of results are generally strengthened by increasing sample sizes and the number of hypothetical scenarios (length of survey) an individual responds to. Lancsar and Louviere (2008) found that a sample of 20 respondents per individual choice scenario is usually sufficient. However, as more attributes and levels are included in a DCE, more individual choice scenarios require answering and there may be a limit to how many separate choice scenarios a person can manage. (Lancsar and Louviere 2008). To handle this, it is possible to give different respondents only some of the choice scenarios as long as each choice scenario is answered by at least some respondents enough times. Though it is important to note that findings may also be influenced by the demographic characteristics of respondents as was found to be a factor in Baltussen et al’s (2007) study on priority setting in Nepal.

Data analysis utilises assumptions from the economics framework random utility theory and requires relatively sophisticated skills in econometrics (economics statistics). There remain a number of points where incorrect survey design can lead to unreliable results (Howe et al 2008, Bryan and Dolan 2004, Fiebig et al 2003, Lancsar and Louviere 2008, Grutters et al 2008, van der Pol et al, Flynn et al 2010, Kjier et al 2006). Therefore, designing a survey and analysing data requires expertise in a number of areas. Lancsar and Louviere (2008) provide a checklist for those considering undertaking, reviewing or commissioning a DCE.

Conclusion

DCEs analyse data on hypothetical choices people make to predict individual and population preferences in relation to a particular policy question. They are useful when real preferences cannot be observed or when a new type of service is under consideration.

DCE applications already exist across a wide range of health policy issues, including:

- how to attract and retain health workers
- how patients/policy-makers/populations think resources should be allocated across health programs
- what type of health insurance schemes people want, how much will they pay and what is the likely uptake
- how much money different health programs/services are worth to people.

DCEs can be a relatively quick and cheap survey tool, but they require expertise in design and analysis.
References and further reading


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