NETSCC, HTA

25 August 2010

Project Title:

Optimal Monitoring Regimes for Individuals with Ocular Hypertension: Modelling and economic evaluation

Work package C: Economic modelling evaluation of alternative monitoring regimes

Preferences for Monitoring Ocular Hypertension: A Discrete Choice Experiment

Research Protocol

Version 3, 19th July 2010

1. Background

Glaucoma is a chronic progressive optic neuropathy leading to impaired vision and sometimes blindness if untreated. Open angle glaucoma (OAG) is the most common form of glaucoma, affecting about 2% of the population over 40 years old in the UK. Ocular hypertension (OHT), generally defined as raised intraocular pressure (IOP) >21mmHg, is one of the major risk factors for developing glaucoma, and the only one that can be treated. In the UK, the majority of people are identified as OHT during a 'sight' test usually to obtain glasses at a community based optometrist. However, there is considerable debate about the role and optimal organisation of a monitoring service for those at risk of glaucoma.

Guidelines for the diagnosis and management of chronic open angle glaucoma and OHT were made available by the National Institute for Health and Clinical Excellence (NICE) in April 2009.[1] The guideline includes recommendation on the most appropriate ways in which a service might be organised based upon the best evidence available to the guideline group. There was, however, insufficient evidence to guide recommendations for monitoring ocular hypertension and therefore new research was recommended.

This study proposes to use secondary data to define a clinical guideline for determining whether monitoring for people with OHT to detect early signs of glaucoma is required, and if so how often testing should be offered to get the best balance of effectiveness (e.g. early cases of glaucoma detected) and efficiency (e.g. balancing the cost of monitoring with the benefits to ensure limited health care resources are used in the best possible way). When determining an optimal monitoring strategy it is essential to understand individuals' preferences for monitoring strategies.

These is debate about whose (society or service users) values should inform the allocation of society's scarce resources, current guidance recommends the use of society's preferences.[8]

We plan to elicit the preference of the public (which may include service users) using a Discrete Choice Experiment (DCE), an approach that has successfully been used by our group to elicit preferences of patients with glaucoma for the outcomes of treatment.[2]

2. Aim

We will conduct a DCE to assess individuals' preferences for a monitoring service for the detection of glaucoma. In particular we will assess:

- willingness to pay for specific attributes of monitoring for detecting early, treatable glaucoma for individuals at risk due to raised IOP and other characteristics (e.g. age, gender and general health)
- willingness to pay for different configurations of monitoring services
- probability of take-up of alternative monitoring regimes
- Feed the estimates from above into an economic evaluation model that forms part of the wider project

3. Methods

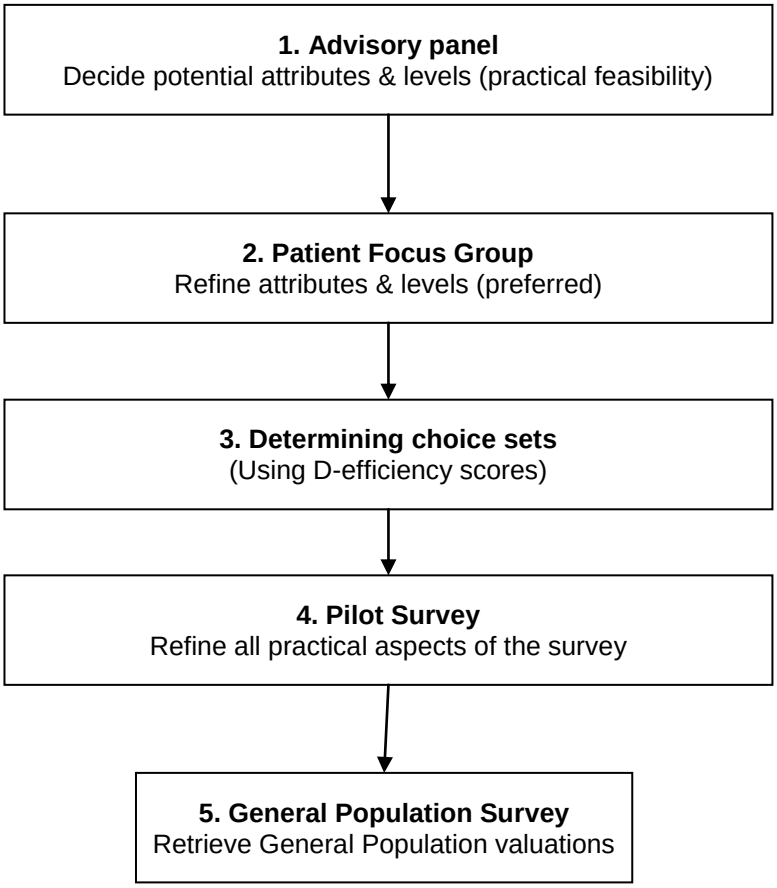
Discrete Choice Experiments (DCEs)

DCEs are an attribute based measure of benefits. The technique has the basic premise that any goods or service can be described by its characteristics (attributes) and second that the extent to which an individual values a good or service and therefore takes it up depends upon the levels of these attributes.[3,4] The technique involves presenting choices to individuals that vary with respect to the level of the attribute

Defining attributes and levels

To define attributes and levels for the DCE an Advisory Panel, a Focus Group and Questionnaire Piloting will be used (Figure 1)

Figure 1: steps to determine attributes and levels for the DCE



Advisory Panel:

An Advisory Panel will be convened for the main project to develop the care pathways for the economic model with participants not directly involved in the project. This will include two potential users of monitoring strategies, one optometrist, one non-clinical health service manager, one specialist nurse, one ophthalmologist, and one community optometrist. The Advisory Panel will develop the potential "attributes" (factors influencing the take-up of

alternative monitoring regimes) and plausible “levels” for the DCE based on information available generated during the development of the application for funding for this work, the applicants and collaborators meeting and their own expertise.

Patient Focus Group:

A Patient Focus Group will also be convened to further develop the attributes and levels. Potential participants will be identified through attendance to the Grampian Glaucoma Referral and Monitoring Scheme Service led by Mr Azuara Blanco, Consultant Ophthalmologist, Aberdeen Royal Infirmary which includes patients with ocular hypertension. This service started in June 2004 and has been developed to improve the diagnostic accuracy of glaucoma to reduce unnecessary referrals to the hospital glaucoma clinic and to develop a community-monitoring scheme for people at risk of developing glaucoma but who do not require treatment.

Initially, around 15 people will be approached; we aim to have a group of 6 to 8 people. Individuals will receive an invitation letter by post (Appendix I) inviting them to take part in the focus group, together with an information leaflet describing the study and what is involved (Appendix II). If after reading the information sheet, individuals wish to participate, they will be asked to return the form attached to the invitation letter provided in a reply paid envelop or telephone the study co-ordinator (contact details will be provided in the invitation letter). After this, participants will be contacted by the interviewer to arrange the focus group meeting (date and time) and a confirmation letter will be sent (Appendix III)). Participants will be encouraged to make contact with the research team for clarification of queries or further information. Participants will express their views on how a monitoring regime could be organised, including the setting where it might take place, testing frequency, monetary value and time spent attending for monitoring. We will use the framework approach to analyse the data obtained.

Determining choice sets:

Once attributes and levels are defined, experimental design techniques will be used to reduce the number of possible choice sets to a manageable size whilst still being able to estimate utility scores for any possible monitoring scenario. Experimental design techniques maximise some statistical measure of efficiency, usually D-efficiency. This ensures precision around the estimated parameters.[5] The choice sets will ask individuals to choose between alternative profiles that vary with respect to the levels of the given attribute (Figure 2). These choices will reflect the criteria of minimal overlap, level balance and orthogonality. D-efficiency scores will be used to ensure an optimal set of choices are presented.[5]

In addition to the choices derived from the experimental design, two choices will be added to test the internal consistency of responses. These will be dominant (better) choices and a respondent would be expected to choose them. Respondents who fail both of these will be dropped from the estimation of preferences weights.

Figure 2 gives a hypothetical example of a DCE question.

Figure 2	**Example of a DCE question: which monitoring service would you choose?**		
	Monitoring service A	**Monitoring service B**	**No monitoring C**
Frequency of testing	Yearly	Every three months	-
Time costs per year	5 hours	2 hours	-
Money costs per year	£20	£40	-
Place of testing	Hospital eye clinic	Local optician	-
Which option would you choose?	**Service A**	**Service B**	**No monitoring C**

Questionnaire Pre-piloting:

Pre-piloting of the questionnaire will be conducted among members of the Health Services Research Unit. The purpose of this pre-piloting will be to test its rationality and validity.

A price proxy will be included so that willingness to pay, a monetary measure of benefit, can be indirectly estimated.[6] It is believed that a reasonable number of attributes to be included within a DCE is around 6 as more than this might lead to an unmanageable number of options by the respondent[7]. The more attributes the less likely the individual to adopt compensatory decision making, which is crucial when estimating marginal rates of substitution. Examples of potential attributes for the present experiment are: the setting where the monitoring might take place (e.g. hospital, community); testing frequency (e.g. 6 months, 12 months, 24 months); monetary value (e.g. £20, £40); time spent each year for monitoring sessions (e.g. 2 hours, 5 hours). Other attribute/s might arise from test characteristics (e.g. discomfort, anxiety).

Questionnaire piloting:

Piloting of the questionnaire will be conducted in a sub-sample of the target populations. Pilot sample size will be big enough to conduct preliminary regression analysis (e.g. around 30 responses per subgroup) for the general population survey. This will be provided by the private company (see below, section on surveys) as part of the commercial agreement. Piloting will allow the detection of potential inconsistencies (e.g. positive relations where negative ones are anticipated).

The Survey

We will conduct a survey among members of the general population to elicit societal preferences.

The questionnaire (Appendix IV) will include a set of DCE choices (around 16) with alternative monitoring schedules that vary with respect to the levels of the given attribute, questions on patients' basic demographics and general health (EQ-5D).

Survey of the general population - a population preferences study

Adults over 18 years old living in the UK will be sampled from the general population. The survey will be conducted through an online research company: Research Now. This company has been conducting online research since 2001 and they provide a full service of field work management, data verification, quality control and conduct of the survey. The company was chosen on the basis of a tendering process and is a company members of the research team have used previously in a National Preventative Research Initiative funded project that used a Discrete Choice Experiment to investigate lifestyle interventions to prevent obesity.

Sample and setting:

Sampling will be done from Research Now's actively-managed online access panel. These panellists are recruited by email and online marketing from over 300 diverse online affiliate partners and targeted website advertising. Panel members actively joined the Valued Opinions panels by completing a registration survey (www.valuedopinions.co.uk). They are judged to have "opted in" by accepting the terms and conditions and by taking part in surveys with the option to unsubscribe at any time. Panel registrations are automatically checked at the time of registration for duplicate e-mail addresses with further checks (e.g. at the time of incentive fulfilment, address files are checked for duplicate addresses) for fraudulent panellists. Basic demographic information (e.g. age, gender, region, household demographics) is collected when signing up to the panel and updated at the end of every survey. An active panel member is defined as a member that has participated in at least one survey, or updated his/her profile data or registered to join the panel within the last 12 months. At April 2009, panel membership across Valued Opinions family country panels around the world was 2,560,262 (these are individual members and not household). Panel management is compliant with all relevant market research standards, local data protection and privacy laws.

For this survey, sample selection will be based on the sample size needs (see section below on sample size). Once the sample has been selected, an e-mail invitation will be automatically generated to potential respondents. The invitation will contain key information for panellists to understand the commitment for the survey e.g. survey topic, survey length, incentive, and the length of time the survey will be open for. Panellists will access the survey through a unique link stated in the invitation e-mail. The content of the survey will be similar to the survey of patient based preferences study concerned with lifestyle interventions to prevent obesity, previously approved by the North of Scotland Research Ethics Committee 2 and will be fully piloted prior to field work. The invitation will also contain a link to the company's privacy policy, an opportunity to unsubscribe from the panel and a link to a member of Research Now's staff for any queries.

Panellists are rewarded for the time they take to complete the survey through a structured incentive scheme. They receive a cash reward for participating in individual surveys – the amount is clearly stated in the invitation e-mail and related to the survey length, interest and

complexity (range between 50p-£5). Once a panellist reward balance reaches £10, they can redeem a voucher which is valid at national retailers.

Each panellist will be assigned an individual ID, allowing the company to monitor panellist activity and distinguish between contact rate (e.g. those who were initially contacted and did/did not complete the survey) and completion rate (e.g. those who completed the survey and did not drop out). The company follows UK data protection procedures. They have secure servers for collecting survey data. Sampling is carried out regularly with highly encrypted links to the database servers. All survey data will be anonymous and linked to the panel database by a unique ID so the panellists' identity is always protected.

Sample sizes

The following considerations govern the necessary sample size:

1. Regression analysis needs a sample size sufficiently larger than the number of independent variables (e.g. DCE number of attributes and levels);[9]

2. For each predetermined subgroup of the main sample, a sample size of 30-100 is sufficient;[10]

A number of factors have been identified which may influence preferences for monitoring for those with ocular hypertension. These are socio-economic status (high, medium and low); age (18-40, 41-60, >60); and general health (3 categories according to EQ-5D scores collected simultaneously). The private company would sample individuals until the targeted sample size is obtained. A purposive quota sampling approach will be employed to identify sufficient participants in each of the defined subgroups. We believe that a sample size of 800 will be enough to conduct the analysis for the general population survey.

4. DCE Analysis and interpretation

Appropriate logistic regression techniques will be used to analyse the response data.[4] The decision on which model to use is an empirical one and will depend, to certain extend, on the data. Following Amaya-Amaya and colleagues[7] we will start with a standard multinomial logit model, then test that restricted assumptions of this model are met, to finally decide on the proper model according to this. For instance, if unobserved characteristics are present and the data likely to be clustered then a nested logit specification might be more appropriate. Moreover, if for particular attributes there is suspicion that tastes might vary considerably across members of the population, then a random parameters model might be adequate. We anticipate that a few model options will be tested and a final model chosen according to data characteristics. The theoretical validity (e.g. the extent to which the coefficients move in the direction one would expect) will be evaluated from the regression results.

The analysis described above will allow consideration of the relative importance of the particular characteristics of the service; as well as the estimation of the probability of take-up of alternative monitoring regimes. The inclusion of a cost attribute will allow monetary values to be estimated for individual attributes as well as different configurations of a screening programme. These monetary values will feed into an economic evaluation model to help inform optimal monitoring strategies for ocular hypertension.

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