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TECHNICAL REPORT

Understanding Patients' Choices at the Point of Referral

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Prepared for the UK Department of Health

The research described in this report was prepared for the UK Department of Health.

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Preface

This report presents the findings of a Department of Health funded study, designed to investigate important questions concerning the way patients will respond to being offered a choice of hospital at the point they are referred by their GP for specialist consultation in a hospital outpatient department. This work has been undertaken by a team from RAND Europe, the King's Fund and City University.

The main objective of the research is to provide an understanding of the factors patients are likely to take into account when choosing between hospitals and, in particular, to examine the choices patients make when they are faced with trade-offs between those factors. Examining these choices and trade-offs provides insights into the relative value patients place on particular characteristics of hospitals (such as waiting times, various aspects of hospital quality and performance, proximity to patients' homes, and so on). In addition, our research provides insights into the potential benefits of different ways of informing patients' choices by structuring and presenting information on each provider. As a result, the information presented to patients when they are offered choice can be better tailored to their requirements – with the potential to increase efficiency in the system as a whole. We also report on differences between types of patients (for example, with respect to age, health and socioeconomic status) in their likely response to being offered a choice of hospital at the point of referral – findings pertinent to the achievement of NHS equity goals.

The data for this project were provided by a sample of the general public who had personal experience of being referred to a hospital. The sample were invited to participate in a discrete choice experiment, which asked them to state the choices they would make if they were in the position of being advised by their GP that they needed to be referred for a specialist consultation in a hospital outpatient department. Participants were presented with sets of providers and asked to indicate which they would choose. The resulting stated preference (SP) choice data provides insights into how patients value various aspects of health care providers, and will enable the Department of Health to predict patient flows and demand for providers.

The initial research design was completed in April 2005 and, working in close consultation with the Department of Health, the research commenced in September 2005, with the bulk of the focus group, field work, model building and write up concluded by December 2005. Given the tight timetable for the work, considerable further analysis of these data is possible: we outline the additional research it would be possible to undertake and the insights that could emerge.

This report will be primarily of interest to policy makers in the Department of Health, health care providers and commissioners. Specifically, this will include health service managers, clinicians and health service researchers, as well as those specifically interested in the application of discrete choice modelling.

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The King's Fund is an independent charitable foundation working for better health, especially in London. The Fund carries out research, policy analysis and development activities, working on its own, in partnerships, and through grants. The King's Fund offers a major resource to people working in health, providing leadership and education courses; seminars and workshops; publications; information and library services; and conference and meeting facilities.

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Summary

Background

This research was commissioned in March 2005 by the Corporate Analytic Team at the Department of Health from a joint research team from RAND Europe, the King's Fund and City University.

The main body of the research employed Discrete Choice Experiments (DCEs) which asked a sample of over 1,000 people across England, with experience of being referred for elective treatment in the previous five years, to respond to a series of hypothetical choice scenarios. In each scenario respondents were asked to select a hospital from a set of five where each hospital had different characteristics (quality, travel times etc), one was designated as the 'local' hospital and some information was provided regarding the GP's view on the various hospitals. Respondents were also given the option of seeking treatment outside of the NHS or not taking up their referral.

Informing the structure of the DCE questionnaire were two focus groups convened in Norwich and London. These workshops produced useful insights into the way patients approach making choices, as well as the sorts of information they said they would find useful in making choices.

Alongside the DCE questionnaire, respondents were also asked to simply rate the importance or otherwise of different aspects of a hospital's performance in making their choices. These included 31 separate performance indicators - more than the DCE approach could cope with - and provided some additional insights into patients' information preferences.

Information from the DCE, focus groups and rating exercise provided a very rich data set. Below are the top-level results obtained from analysis of this data. The main body of this report contains more detailed results and descriptions of the methodological approaches.

Provider quality

- Higher quality hospitals will tend to be chosen more often than others, all other things being equal, although on average there are diminishing returns to all aspects of a hospital's performance improvement: in making their choices, respondents attach decreasing importance to successive increases in hospital performance.
- Of the different aspects of provider performance, clinical quality (measured in terms of impact on patients' health) exerted the largest influence on choice of hospital. Those without formal educational qualifications placed significantly *less*

weight on increases in this factor above an 'average' level compared with those with qualifications (GCSE/O level and above).

- Choices appear to be influenced in similar ways regardless of whether impact on health information is hospital or clinical team based. However, further analysis is required as separate questioning indicated that the latter level was preferred.
- Reductions in waiting times below 10 weeks (from GP referral to treatment if needed) were *not* valued by respondents and exerted no influence over the choice of hospital, although as waiting times increased above 10 weeks these were found to have an increasingly negative influence of the likelihood of an individual choosing the hospital.

GP influence

- GPs' advice over which hospital to choose was found to be important, but it did not override other information (e.g. about the performance of hospitals, travel time etc).
- Negative advice from the GP was given a higher weight than positive advice in favour of a particular provider.

Travel modes, costs and times

- There was a general preference for shorter travel times although the exact weight placed on the travel time depends on the mode of transport adopted.
- There was also a preference for lower travel costs, regardless of eligibility for refunds under the HTCS scheme.
- Offering refunds to those who are not typically eligible under the HTCS scheme did not act as an additional incentive to select a particular hospital.

'Loyalty' to the local provider

- Certain respondent characteristics (e.g. having poor health or typically travelling to the local hospital by bus) were associated with 'loyalty' (i.e. a higher propensity to select the local provider) and others (e.g. internet access or a poor perception of the local hospital) were associated with disloyalty. In addition to these patient-specific characteristics, there was an inherent bias towards the local provider that affected all respondents.

Socio-economic & demographic factors

- A number of key socio-economic or demographic variables were not found to have direct influences on choice (e.g. age, marital status, gender, procedure) - although they may be correlated with factors that are determinants of choice and thus exert an indirect effect (further analysis is required to demonstrate this).
- Because loyalty effects are related to respondent characteristics there is likely to be a social gradient in the way that patients make choices, and our initial analysis in this area highlights that certain patient groups are likely to be more sensitive to differences in quality than others. Such a social gradient will mean that under choice, there may be a consistent bias between social groups, with choices being

more heavily influenced by clinical performance for some groups than others, for example. This could widen inequalities of access to high performing hospitals and the 'market' signals sent to providers by patients' choices would be inconsistent. Further analysis is required to assess the extent and significance of these effects.

Wider applications and further research

- The top-level results noted above have focussed on the effects and influences that various hospital performance and characteristics had on respondents' choices, on average. They also relate to the trade-offs that respondents made in making their choices. However, the research has wider applications and there are several potentially fruitful avenues for further research. For example:
 - o Development of a forecasting/trust-level demand modelling application
 - o Collection of data on revealed preferences through Choose and Book
 - o Further analyses of the social gradient
 - o In-depth examination of ratings of items within domains
 - o More advanced modelling of demand in the context of choice

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The data reported in this study were collected by Accent. Accent's role in helping to develop and test the questionnaire design and coordinating the large data collection exercise is gratefully acknowledged.

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1.1 **Background to the study**

The Department of Health is implementing a new system for GP specialist referrals which will give NHS patients requiring a first outpatient appointment a choice of the hospital to which they will be referred. From January 1st 2006, all patients should be offered a choice of around five hospitals, pre-selected by their local primary care trust (PCT)¹. By 2008, it is planned that all patients requiring a first outpatient attendance will have the choice of any NHS hospital (or private sector hospital contracting with the NHS) in England. This will be combined with an electronic booking system, “Choose and Book”, which will enable patients and their GPs to book a specific day and time for an appointment at the chosen hospital².

This new choice policy builds on a number of pilot patient choice schemes such as the London Patient Choice Project and the heart surgery scheme. However, there is an important difference between those earlier experiments and the way choice is to be rolled out across the NHS. The pilots were essentially capacity planning exercises offering choice of quicker treatment to patients who were already on inpatient waiting lists. In contrast, ‘choice at the point of referral’ introduces choice much earlier in the patient pathway: it is essentially a choice of outpatient department (and, for those patients for whom inpatient care is subsequently recommended, by default it is also a choice of hospital for inpatient care).

The broad aims of the government’s policy on choice are two-fold. First, to engage patients as part of a new performance process that, coupled with a new provider reimbursement system (Payment by Results), will exert real financial pressure on providers. In this new system, money follows the patients – and patients will ‘vote with their feet’ by selecting hospitals that best meet their requirements. Patient choice is a key lever for improving quality and performance in the NHS. Secondly, providing greater choice for patients should, in theory, enable patients to better match their preferences regarding their treatment with what’s on offer – improving the responsiveness of the health care system and their satisfaction with it.

¹ see: <http://www.dh.gov.uk/PolicyAndGuidance/PatientChoice/fs/en>

² see <http://www.chooseandbook.nhs.uk>

Given these aims, and the importance of patient choice to the Government's NHS reform agenda, the type of information about providers which is made available to patients, how it is presented, and how patients respond to it, becomes critical. It is planned that patients will have access to a range of information about the hospitals they can choose. Some of the information will provide descriptions of facilities and administrative processes - the availability of car parking, visiting hours etc - and some will concern the performance of the hospital - waiting times, average length of stay, MRSA rates etc. Exactly what type of information, in what level of detail and how it is provided remain to be decided (although work is currently progressing on these matters, both locally and nationally).

As part of this work, the Department of Health asked a team of researchers from RAND Europe, City University and the King's Fund to investigate what factors will drive patients' choices at the point of referral, in order to provide some insights not only into the types of information patients require, but also the value patients place on specific aspects of hospitals' performance and, more generally, their characteristics. A related piece of research - which will be reported separately - was also commissioned from the King's Fund and focuses on the role and attitudes of General Practitioners with regard to patient choice at the point of referral.

1.2 **Aims and objectives of the research**

The primary aim of this research was to ascertain patients' likely response to choice at the point of referral given a range of information regarding the quality and timeliness of care from different providers, some of which may not yet be available.

Specifically, the Department of Health brief for this research stated the following objectives:

1. To construct a robust algorithm which would allow the prediction of the likely level of and variation in demand for the services of particular providers on the basis of the relevant characteristics of the health care providers on offer, and the relevant characteristics of the patients themselves. Such characteristics are likely to include:

Patients:

- age
- socio-economic group
- morbidity
- condition/elective surgery type
- prior use of hospital services
- gender
- location, including rurality
- prior experience and views regarding the providers

Providers:

- travel time (from nearest hospital to three hours)
- travel costs

- waiting time for outpatient diagnosis (from one week to sixteen weeks)
 - waiting time for inpatient treatment (from two weeks to thirty weeks)
 - patient-experience quality (including different ways of presenting this information)
 - clinical quality of hospital (including different ways of presenting this information; e.g. cleanliness as a marker)
 - clinical quality of surgical team (including different ways of presenting this information).
2. To gauge the likely impact of falling waiting times in the NHS, and of information on quality of NHS providers, on patients' decisions to opt for NHS acute care (as opposed to self-care - that is, to decline a referral - or to seek non-NHS care).
 3. To understand the impact that General Practitioners' views and recommendations about providers are likely to have on patients' choices of hospital.
 4. To understand the impact on patients' choices of provider of different ways of presenting information on providers.
 5. To differentiate, as appropriate, between different elective surgery procedures and to investigate the stability of patient preferences across different procedures, taking account of the characteristics of surgical procedures including: inpatient vs. daycase; expected length of stay; mortality risk; and uncertainty of diagnosis.

1.3 **An overview of our research approach**

Our research addressed these aims and objectives using stated preference discrete choice experiment techniques. The instruments used to collect data were developed in close consultation with the Department of Health, in order that information on providers was presented in a manner as close as possible to that which was being developed in other projects that were ongoing on the implementation of patient choice.

Workshops were used to test alternate means of presenting and formatting the information and choices; detailed qualitative investigations were conducted on the effect of the instrument's design, and presentation of information. The instrument design was finalised in the light of results both from the workshops and from piloting.

We recruited a sample of the general public who had had personal experience of being referred to a hospital within the previous 5 years, on the grounds that these individuals had some experience both of being referred into the secondary care system and of ill health and thus could readily place themselves in the hypothetical situation of being asked to make a choice at the point of referral.

The sample were invited to participate in a discrete choice experiment, which asked them to specify which of five hospitals, described in terms of their quality, waiting times and other characteristics, they would choose if they were in the position of being advised by

their GP that they needed to be referred for a specialist consultation in a hospital outpatient department.

The resulting data were used to construct an econometric model of patients' choices. The modelling results provide insights into how patients value various aspects of health care providers; as well as allowing us to identify any differences between patients, in terms of health, socio-demographic or other characteristics, in how these choices are made.

In Section 2 we provide a brief introduction to discrete choice modelling. Our research design, data, and modelling approach are described in more detail in Sections 3-5 of the following report. Section 6 describes in non-technical language how the model results are to be interpreted, and highlights their implications both for understanding patients' choices, for predicting hospital demand, and for policy development. We conclude by highlighting further analyses which would be possible from these data. Full details of the survey instruments and focus group reports are contained in the Appendices.

2.1 **Background to stated preference discrete choice experiments**

Stated preference discrete choice experiments provide an analytical method for understanding and predicting how individuals make decisions between discrete (mutually exclusive) alternatives; for example, whether to travel by bus or train, whether to be treated at their local hospital or to travel to a hospital further away where they will be treated more quickly. It is a technique that has been widely used in transport economics and is increasingly used in environmental and health economics.

Within this framework, it is possible to investigate the importance of specific drivers of choices. For example how important a hospital's reputation is compared to a patient's travel time to reach the hospital. The outputs from the modelling can also be used to develop predictive models of behaviour. These modelling techniques provide empirically-derived data for making informed decisions, be that at a strategic level or for developing operational understanding of service delivery.

The use of Stated Preference (SP) data, which involves the presentation of hypothetical choice situations to individuals, enables researchers to examine demand for hypothetical goods or services. SP data also has many useful statistical properties as the way the hypothetical choices are presented can be controlled so that there is little or no correlation between explanatory variables, and small and large variations in explanatory variables can be tested. The technique is also data efficient: more than one choice scenario can be presented to respondents within one interview. However, such data is based around what individuals state they would do in hypothetical situations, which may not exactly correspond with what they would do if faced with the same choice in real life.

In a SP discrete choice experiment (DCE), hypothetical choice situations - where each alternative is described by a set of attributes (waiting time for treatment, cost of treatment etc in the case of health) - are presented to each individual. Each of the attributes in the experiment is described by a number of levels. The attribute levels are combined using principles of experimental design to define different service packages, which respondents evaluate in surveys by choosing one of the alternatives within the choice situation, dependent upon the levels offered and their own personal preferences.

Box 1 describes in more detail the theoretical underpinning and statistical modelling for a discrete choice experiment.

Box 1: Theoretical background to modelling discrete choice data

Discrete choice models are used to gain insight into what drives the decisions that individuals make when faced with a number of alternatives. These models are constructed by specifying the range of alternatives that were available to the decision maker, and describing each of these alternatives with a utility equation which reflects the levels of each of the attributes that were present in the choice that they faced. Each term in the model is multiplied by a coefficient which reflects the size of its impact on the decision making process (Ben-Avika and Lerman, 1985; Train, 2003).

It is the model coefficients that are estimated in the model calibration procedure. The model is based on the assumption that each respondent chooses the alternative that provides him or her with the highest utility. An error term is included on each utility function to reflect unobservable factors in the individual's utility. The estimation can therefore be conducted within the framework of random utility theory, i.e. accounting for the fact that the analyst has only imperfect insight into the utility functions of the respondents.

The most popular and widely available estimation procedure is logit analysis. The estimation procedure produces estimates of the model coefficients, such that the choices made by the respondents are best represented. The standard statistical criterion of Maximum Likelihood is used to define best fit. The model estimation provides both the values of the coefficients (in utility terms) and information on the statistical significance of the coefficients.

Additional terms and non-linear variations in the variables can be added to these utility functions, with the testing of the appropriate forms for the utility functions being an important part of the model estimation process. By examining different functional forms we can investigate whether different groups of respondents place different values on the attributes in the choices, and can also test whether there are certain groups of respondents that are more likely to systematically choose one alternative over another.

2.2 **Motivation for using a stated preference discrete choice framework for this study**

At the time that this research project was commissioned, there was little evidence on how patients' may respond to a choice of hospital at the point of GP referral. This lack of real-world data, coupled with a desire to understand how patients may value different aspects of the quality of their hospital care, provided the basis for modelling hypothetical choices through a discrete choice experiment.

The use of a discrete choice experiment allowed the quantification of how people traded off aspects of the quality of the service provider with waiting time, travel time and any advice provided by their GP. As such, it was seen as a way to gain insight into how choice at the point of referral may develop, with the particular benefit that it allowed some early

judgements to be made about which sorts of information members of the public may consider to be important when placed in a situation where they were asked to make choices between hospitals.

This is a framework with which the study team has significant experience, and has previously successfully applied these techniques to gain an understanding of how patients made their choices in the London Patient Choice Project (LPCP), see (Burge et al, 2005) for further details.

3.1 **Sampling**

Members of the general public were contacted by telephone using random digit dialling, and were then recruited to take part in the survey, containing the discrete choice exercise. These individuals were recruited and filtered using a brief recruitment questionnaire (presented in Appendix A).

Given the hypothetical nature of the choices involved in the discrete choice experiment (DCE), a decision was taken to filter out members of the general public who had *not* been referred for elective surgery by their GP in the last five years.

Respondents were asked to provide details of the situation in which they had previously been referred and then asked them to imagine themselves in a similar situation when making the choices in the experiment. This allowed us to explore how choice behaviour may differ according to the nature of the referral.

Whilst it was necessary to call a significant number of people to track down potential respondents that had been referred, this was less time consuming than may be expected as the incidence of GP referrals is actually quite high in the population. This was judged to be by far the quickest way of recruiting participants; recruiting through GP surgeries may seem a more intuitive way of identifying potential respondents, but in fact there are a large number of GPs and each GP refers relatively small numbers of patients. As a result, to achieve a sufficiently large sample with such an approach would have required the participation of a large number of surgeries, and would have taken far longer than the five weeks that the telephone approach required.

Sufficient surveys were undertaken to obtain data from 1,000 individuals for analysis. Sample size calculations were clearly difficult to make for this sort of study, as there is little existing work in the area from which to extract values for use in any power calculation. However, the models estimated in the LPCP study (Burge et al, 2005) provided information on the size of the standard errors on the estimated parameters in a similar context (after taking account of multiple responses) and these were used as a guide to the appropriate sample size.

We did not stratify the sample or impose quotas on the number of respondents required by age, gender, income or social group, thereby aiming to achieve a sample that was broadly representative of the referred population.

3.2 Survey approach

The DCE was undertaken using a phone-post-phone survey approach. The choices offered to respondents included many dimensions and as such needed to be presented either on paper or through a computerised survey (face-to-face or internet). With the telephone interview approach, respondents were first contacted and recruited by telephone, then mailed paper copies of the DCE choice questionnaire, and then phoned back to undertake the interview. A telephone approach was selected as it allowed a wide geographic coverage and was likely to return higher response rates than postal or internet approaches.

3.3 Design of instrument

In order to design a DCE that provides quantifications of the main drivers of demand, it is necessary to gain an insight into which factors are likely to be most relevant to those facing choice at the point of referral. There was a large range of information that could have potentially been presented to patients, and there was also potential for the format in which this was presented to have significant impacts on the weight assigned to the information.

In practice, however, under Choose and Book some initial discussions had already taken place concerning the sort of information that would be made available to patients and the way it would be presented. As such, the design of the discrete choice exercises was influenced by the type and style of choices that patients may have expected to have been offered once choice at the point of referral went live.

The following sections discuss the factors which, intuitively and as a result of developments under Choose and Book, were considered important factors in patients' choice decisions.

3.3.1 Presentation of information on alternative providers

At the time of the survey design, the Department of Health, in conjunction with the London Strategic Health Authorities, was developing a tool for providing information to patients on the alternative providers they could choose between when offered choice at the point of referral (see Figure 1 for an example of the formats that were being considered at an early stage of that work). At that time, it was proposed that the information tool would cover five main domains:

1. Access, transport and convenience
2. The Hospital: facilities, standards and food
3. Inpatient treatment and care
4. Impact on your future health
5. Waiting times

Each of these domains would then be split into a number of sub-domains. In addition, there was interest in how the values placed on the "impact on your future health" may vary according to whether the information presented related to information on the performance across all procedures and all clinical teams within a hospital, or whether the information

was for the procedure the patient was referred for, and the clinical team which would treat them.

It was also proposed that the performance of each provider would be presented in a graphical format, such as stars or other symbols, with the most likely format being a five point scale to allow a simple comparison, along with more precise numerical values to allow more detailed comparisons to be made.

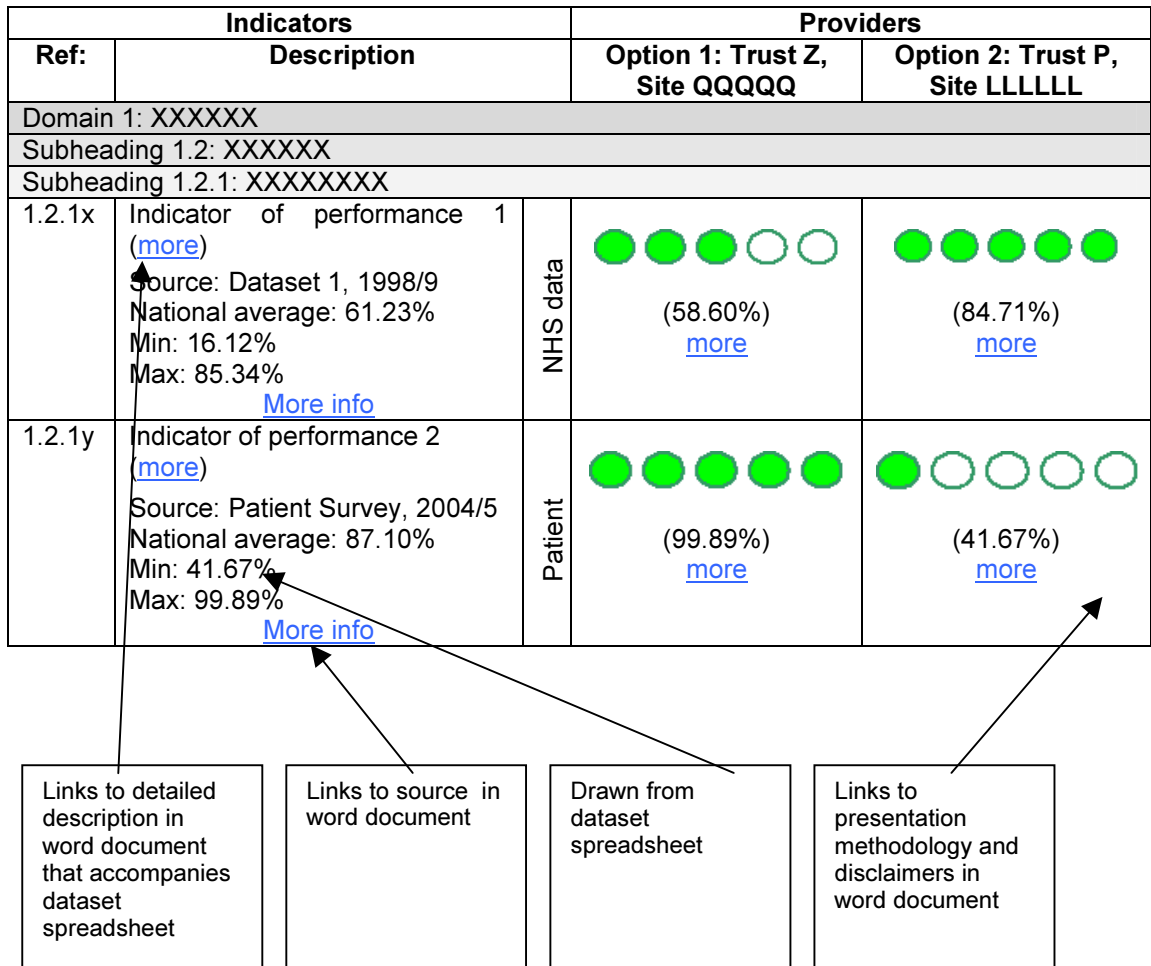


Figure 1: Illustration of possible ‘compare’ screen for comparison of alternative providers

Decisions about the ‘levels’ within each domain were based on a trade-off between the research objectives and what could be realistically expected from respondents in terms of processing the information presented in order to make sensible choices. It was judged that the information presented to respondents had to be at the top level (that is, the five domains) rather than, say, at one level down (which would have required respondents to process over 35 separate pieces of performance data per hospital³).

³ Restrictions on the practical handling of the number of attributes are one of the limits of discrete choice experiments. In reality, patients may consult a very large range of information about hospitals before making their choice. However, in this DCE, an attempt has been made (at the cost of generalisation) to capture the key ‘domains’ of performance information patients and the public say they are interested in.

However, in order not to lose all information on the values of aspects defined at the sub-domain level for each of the five domains a simple rating exercise was also carried out, in which respondents were asked to rate the importance of various sub-domain factors on a scale of 1 to 5, where 1 was “extremely important” and 5 was “not particularly important”.

3.3.2 Identification of hospitals

In a real choice situation patients will be faced with a choice between four/five hospitals. As the hospitals are named, patients will be able to look up the address of the hospital and work out where the hospitals are located; they may also have some prior experience or have anecdotal information on the hospitals.

It was practically impossible to replicate this actual choice situation in the DCE. However, in order to explore possible ‘provider loyalty’ the respondent’s existing or local provider was included as one of the possible choices of hospital⁴. In addition, the service levels provided by the local provider were varied in the choice scenarios, reflecting situations where the offering from the existing provider may improve or deteriorate.

By moving to the presentation of generic hospitals we overcame any problems that may have been encountered with presenting unrealistic information about named hospitals; however, this then introduced the need for additional information on the location of the hospitals.

There were a number of options for describing the location of the hospitals to respondents. This issue was explored in some detail in the London Patient Choice Project Evaluation, where cognitive interviews were used to explore how patients would best understand the concept of the proximity of the alternative hospital; whether this was best presented as regions, distances, or travel times. The feedback from the cognitive interviews at that time suggested that patients preferred to think in terms of travel times. As such this was considered the most desirable option for describing the relative accessibility of each of the alternatives.

In addition to travel times, the mode of travel was also considered, a priori, to be an important factor in patients’ choice decisions. For each hospital, details for both travel by public and private transport were presented

However, it was not clear at the design stage whether patients facing such a choice in real life would consider the costs of travel when making their decision, and if they did, whether their perception of the cost of travel would be correct (it should be noted that car users typically underestimate the true cost of travel). As such there was a potential sensitivity around not heightening respondents’ awareness of costs in the choice exercises. However, if travel costs were really an important consideration they would need to be included in order to be taken into account in the models. This was an issue that was identified for further exploration in the design workshops (see section 3.4 and Appendix B).

⁴ ‘Included’ in the sense that they were first asked to identify their local hospital, and then one of the hospitals in the DCE was labelled ‘Local hospital’

3.3.3 Influence of GP

An important issue for Choose & Book is the extent to which GPs may influence (directly or indirectly) the decisions made by patients. It is likely that in many circumstances the patient will ask the GP for their advice as to which provider they would recommend. There are many ways a GP could respond to such a request. Discussion with a number of GPs suggested that possible response mechanisms could include:

1. Decline to provide any advice
2. Advise in favour of a hospital (“go to this one”)
3. Advise against a hospital (“don’t go to this one”)
4. Rate each hospital (“this one is good, this one is bad”)

As the range of potential types of advice was quite wide, and could influence patients in different ways, it was decided to adopt a design where in some cases the choice would contain advice from the GP, but in others it would not. An additional strength of this approach was that we included situations where the GP does not provide advice, and as such we could mitigate against the potential for the GP advice to dominate the rest of the variables within the experiment.

3.4 Workshops

Although many of the factors influencing patients’ choices can be identified in the abstract - as noted above - in order to inform the SP survey we also undertook four workshops, each with 12-15 participants who had been referred to a consultant by their GP within the last 3 years. This was an essential part of the study as it:

- enabled the language used to describe patient choice to be assessed; this was imperative to ensure that terms used in the questionnaire were not ambiguous or difficult to understand as this could lead to the collection of erroneous information;
- enabled a greater understanding of the issues; this was required to ensure that the correct questions were asked and consequently that relevant information was collected; and
- enabled the appropriate attributes and levels of alternative healthcare provider attributes to be defined for the discrete choice component of the questionnaire.

We undertook four workshops in order to ensure a cross section of socio-economic groups, political viewpoints and reasons for referral. Two were held with participants from London and two with participants from Norwich. This was done in order to gain an insight into the differences in factors that may affect choice between people in areas of different urban density and with different availabilities of hospitals to choose between. A significant number of the Norwich participants were also drawn from the surrounding rural area.

Overall, there were several key issues that arose in all groups. These issues included: a lack of information available within the current system, a desire to know the reputations of the hospital and the consultant, hygiene information, the availability and reliability of health

technology, and transport issues. However, some issues came up as only being important in either rural or urban settings (such as whether choice itself should be an issue, waiting times and the need for follow up appointments). The majority of issues showed no correlation to setting and in some cases only applied to sub-groups of participants. These issues included: past experience of a hospital, private sector involvement in healthcare, alternative medicine, facilities in hospitals, timing within the referral system and interestingly, GP opinion weighting. Figure 2 shows the key points learned during the workshops and also the different ways in which people actually made choices within their initial tests of the discrete choice experiments. If an issue was only raised in one setting this does not necessarily mean that it would not be a concern for people in other settings, rather that there was sufficient concern for it to be raised without prompting by those participants in the setting in question.

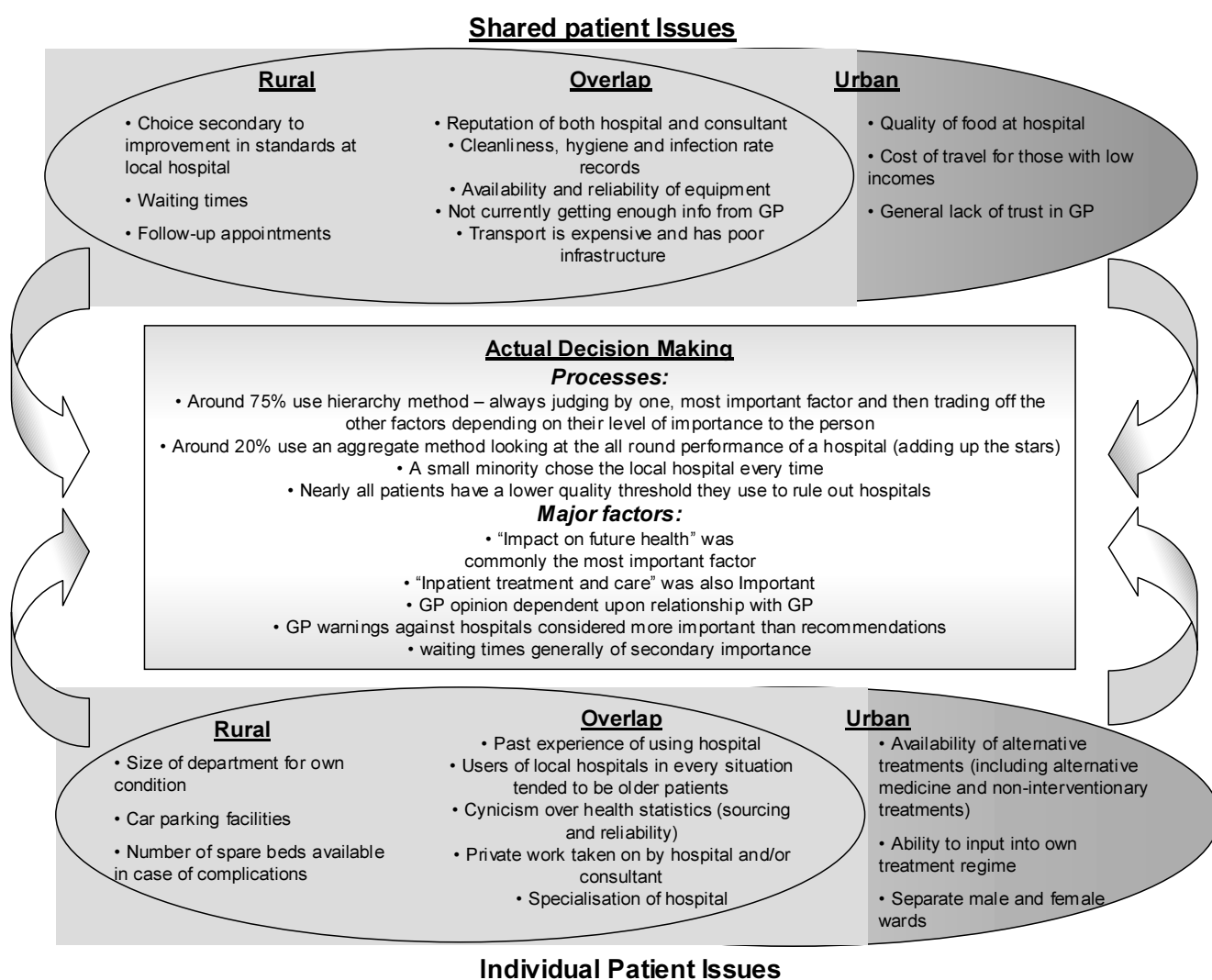


Figure 2: Issues identified through the workshops

Other important issues that the workshops flagged up, but do not feed directly into choice making within the scope of “Choose and Book” include:

- The problem of GP time and relationship with patients, is the role of GP as “gatekeeper” likely to function correctly?
- Will the new system create centres of excellence and very poor hospitals that may go bust?
- How can the past experiences of patients be fed into the new system?
- What will happen to those people who are not able to make choices (such as children, people with learning disabilities, institutionalised people)?
- Will this system end up discriminating against lower income groups whose choice would be completely limited by cost of travel?
- Will waiting times become much larger at popular hospitals?

These are all important concerns to patients, and they may be of importance in the way in which Choose and Book functions, as well the wider judgements that people may make of the system.

Further details of the results from the workshops are contained in Appendix B.

3.5 Questionnaire structure

A questionnaire structure was developed, drawing on the input from the workshops. This was designed primarily to collect the discrete choice data of interest for the modelling of choice behaviour, but also included questions to build the context for the respondents and collect information on factors that could influence choice behaviour (such as the socio-economic background of the respondent and their health history). The general structure of the questionnaire and the final questionnaire are presented in Appendix C.

3.6 Piloting of the survey

Once the basic design for the survey and the discrete choice exercises had been developed, a pilot of 100 respondents was undertaken to test:

- the process of recruiting respondents;
- the administration of the survey;
- the wording of the questions; and
- the ability of respondents to complete the DCE.

After the pilot a couple of major revisions were proposed to the experiments. Concern was expressed by the research team that these changes should be piloted before committing to undertake 1,000 interviews, as there existed the potential for these changes to have unanticipated impacts. Following discussions with the team at the Department of Health it was agreed that a second pilot of 100 respondents should be undertaken to ensure that the changes made do not have unintended impacts.

Conclusions from the two pilots conducted are contained in Appendix D

3.7 The final DCE design

The discrete choice experiment contained information on the factors which may influence the choices that patients will make when offered choice at the point of referral. For each hospital offered, the respondent was told the travel time and cost (by both car and public transport), some information which the NHS would provide them on the service provided by the hospital, and the advice that their GP may provide.

Following discussions during the pilot stages the information provided by the NHS was split into the following five different domains:

- A. Access and convenience
- B. Hospital facilities, standards and food
- C. Personal experience of care
- D. Impact on health
- E. Waiting time from referral to treatment (if required)

Half of the respondents were told that domain D (impact on future health) was “based on the performance across all procedures and all clinical teams within the hospital” and half were told that it was “based on the performance for the procedure that you were referred for and the clinical team which would treat you within the hospital”.

3.7.1 Choice alternatives

In each hypothetical choice in the discrete choice experiment the respondent was asked which of five hospitals they would have chosen and how they would have travelled to that hospital (a choice between their local hospital and four alternative hospitals). Respondents were also able to indicate that they would have chosen to seek alternative treatment from a non-NHS provider or to decline referral at that point in time.

Each of these hospitals were described by a number of variables, these are described in the following section.

3.7.2 Variable levels

Appendix E provides a detailed description of the experimental design techniques employed in developing the discrete choice experiment. The rest of this section describes each of the variables within the design, in turn, and sets out the levels that the respondents were presented when asked to make their choices.

Car travel time

The travel time to the local hospital was kept constant in all choices, but the travel time to the alternative hospitals offered was varied. Thirteen different values of car travel time to the alternative hospitals were explored across the sample of respondents, ranging from 30 minutes to up to 4 hours. The initial intention was to use increments of 30 minutes, but it was deemed useful to add some additional cases with an increment of 15 minutes to allow greater variation in the travel time differences, to provide more interest for respondents and allow closer examination of the linearity of any valuation. As a result we settled on a design that grouped the travel times into five different bands, and each respondent was presented with one value randomly chosen from each band.

Band	Value	Travel Time
1	1	30 mins
	2	45 mins
	3	1 hour
	4	1 hour
2	1	1 hour 15 mins
	2	1 hour 30 mins
	3	1 hour 30 mins
	4	1 hour 45 mins
3	1	2 hours
	2	2 hours
	3	2 hours 30 mins
	4	2 hours 30 mins
4	1	2 hours 45 mins
	2	3 hours
	3	3 hours
	4	3 hours 15 mins
5	1	3 hours 30 mins
	2	3 hours 30 mins
	3	4 hours
	4	4 hours

Table 1: DCE design - Car travel time levels

Car travel cost

The travel time to the local hospital was collected during the initial recruitment phase for the survey, along with the respondent's best estimate of the travel costs. This was kept constant in the discrete choices. The information on travel time and cost was also used to calculate a cost per minute of travel; this was then used as the starting point for calculating the travel costs to the alternative hospitals. A range of different multipliers were applied to the travel costs to ensure that travel time and cost were not perfectly correlated, but were still credible.

Level	Car cost multiplier
1	50% of existing car rate
2	75% of existing car rate
3	100% of existing car rate
4	125% of existing car rate
5	150% of existing car rate

Table 2: DCE design - Car travel cost levels

Public transport travel time

The travel times to the alternative hospitals by public transport were calculated by applying a range of multipliers to the car travel time offered for the alternative. This ensured that the travel times for public transport were in a range that were credible when compared to the car travel times, but allowed situations where the public transport options were

sometimes quicker than car and sometimes slower. These levels were changed for the second pilot (and main data collection phase) to reduce the maximum duration of the public transport journeys.

Level	PT time multiplier
1	60% of car level
2	80% of car level
3	100% of car level
4	120% of car level
5	150% of car level

Table 3: DCE design - Public transport travel time levels (Pilot 2 and main survey)

Public transport travel costs

As with car, the travel time to the local hospital by public transport was collected during the initial recruitment phase, along with the respondent's best estimate of the public transport travel costs. These were then kept constant for the local hospital alternative in the discrete choices. This information on travel time and cost was also used to calculate a public transport specific cost per minute of travel; this was then used as the starting point for calculating the travel costs to the alternative hospitals. Again, a range of different multipliers were applied to the travel costs to ensure that travel time and cost were not perfectly correlated, but were still credible.

Level	PT cost multiplier
1	50% of existing PT rate
2	75% of existing PT rate
3	100% of existing PT rate
4	125% of existing PT rate
5	150% of existing PT rate

Table 4: DCE design - Public transport travel cost levels

Refunding of travel costs

An additional variable was added for the second pilot, which informed patients whether they would be offered refunds of the travel costs for some of the hospitals offered. Prior to the choice exercise, information was collected on whether the patient was entitled to free transport under either the Patient Transport Scheme or the Hospital Travel Cost Scheme. Those patients that were currently entitled to free transport were informed that they would remain entitled to free transport to any of the hospitals offered. In addition, the new variable specified whether the hospital would extend the transport cost refunds to all patients. This was specified in such a way as to ensure that there were not an equal number of situations where transport costs were and weren't refunded, as this was unlikely to happen in real life. A design was therefore adopted where the costs were refunded on average one time out of every four; which with a choice of five hospitals, meant that in most cases one or two of the hospitals offered a transport refunded, but rarely more.

Level	Costs refunded for
1	HTCS only
2	HTCS only
3	HTCS only
4	All patients

Table 5: DCE design - Transport cost refund levels

NHS information: domains A-D

For domains A-D, the information provided by the NHS on the performance and facilities provided by each of the hospitals, was described by a rating on a scale of 1 to 5, where:

- ○ ○ ○ ○ was well below average
- ● ○ ○ ○ was below average
- ● ● ○ ○ was average
- ● ● ● ○ was above average
- ● ● ● ● was well above average

Waiting time: domain E

Fifteen different values of waiting time (from referral to treatment, if needed⁵) were explored across the sample of respondents, ranging from 4 weeks up to 32 weeks in increments of 2 weeks. These values were grouped into five different bands, and each respondent was presented with one value from each band.

⁵ Waiting time was not just the wait for the first outpatient appointment, but the *combined* outpatient and inpatient wait.

Band	Value	Waiting Time
1	1	4 weeks
	2	6 weeks
	3	8 weeks
2	1	10 weeks
	2	12 weeks
	3	14 weeks
3	1	16 weeks
	2	18 weeks
	3	20 weeks
4	1	22 weeks
	2	24 weeks
	3	26 weeks
5	1	28 weeks
	2	30 weeks
	3	32 weeks

Table 6: DCE design - Waiting time levels

GP advice

Four different situations were considered in the discrete choice exercise.

1. GP provides no advice
2. GP advises in favour of one hospital
3. GP provides a rating for each hospital
4. GP advises against one hospital

In the cases where the GP advises in favour or against a single hospital, an additional variable is used to specify which of the five hospitals offered this advice applies to. In the cases where the GP provides a rating for each hospital a variable is then used to assign one of four possible ratings for each of the five hospitals available.

Level	GP rating
1	Good
2	Neutral
3	Bad
4	Don't know

Table 7: DCE design - GP advice levels

3.7.3 Format of choices

The analysis of the first pilot suggested that the choices made by the respondents may have been influenced by the layout of the choice cards. In particular, everything else being equal, the hospitals to the left seemed to be chosen more frequently. The second pilot tested five different versions of the choice cards: in each the Local Hospital was placed in a different column position, this was done to isolate any loyalty for the Local Hospital from any positioning effects.

The issue of the positioning of the hospital on the choice cards also raised a question as to whether the positioning of the variables within the choice set may also have an impact on the value that respondents placed on the variables. As a result more choice layouts were explored in the second pilot; in total 30 different layouts were examined (5 permutations of local hospital position and 6 permutations of variable group positions).

The following figure provides an example choice from the discrete choice experiment.

Choice 2 1
A

If you had been offered these choices when your GP referred you to the hospital, which provider would you have chosen, and how would you have travelled to the hospital?

Provider	Local Hospital	Hospital 2	Hospital 3	Hospital 4	Hospital 5
Location					
Travel time by Car Travel cost by Car, including parking costs	20 mins £3.00	3 hours 30 mins £31.50	3 hours 30 mins £23.60	4 hours £27.00	4 hours £27.00
Travel time by Public Transport Travel cost by Public Transport	25 mins £4.00	3 hours 30 mins £16.80	2 hours 5 mins £10.00	3 hours 10 mins £38.00	3 hours 10 mins £30.40
Travel costs refunded by hospital	All patients	HTCS only	HTCS only	HTCS only	HTCS only
Information provided by the NHS					
A. Convenience and efficiency B. Hospital facilities, standards and food C. Personal experience of care D. Impact on health (based on hospital performance) E. Waiting times (from referral to treatment)	●●○○○ ●●○○○ ●●○○○ ●●○○○ ●●○○○ 20 weeks	●●●○○○ ●●●●● ●●●●● ●●●●● ●●●○○○ 22 weeks	●●●○○○ ●●●●● ●●●○○○ ●●●○○○ ●●●○○○ 8 weeks	●●●○○○ ●●○○○ ●●○○○ ●●○○○ ●●○○○ 24 weeks	●●●●● ●●○○○ ●●○○○ ●●○○○ ●●○○○ 14 weeks
GP opinion of hospital				Recommended	

Please select ONE of the following options:

	Local Hospital	Hospital 2	Hospital 3	Hospital 4	Hospital 5
Travel by Car	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Travel by Public Transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Look for alternative not paid for by NHS	<input type="checkbox"/>				
Decline referral at this time	<input type="checkbox"/>				

Figure 3: Example choice

An example of the introduction sheet that was posted to respondents, to accompany the choice cards, is provided in Appendix F.

4.1 **Recruitment of participants**

4.1.1 **Main survey**

The participants for the survey were chosen at random from the whole population. A total of 5,870 individuals were contacted by phone. Out of these, 2,103 (35.8%) satisfied the conditions in the recruitment questionnaire (i.e. were prepared to talk to the interviewer and had experienced at least one GP referral in the previous five years). Of these 2,103 potential recruits, 1,770 (84.2%) agreed to participate in the discrete choice survey (which required a second, longer, telephone interview). 528 (29.8%) dropped out between the recruitment and the survey.

In total 1,002 respondents were interviewed, selected randomly from those that agreed to participate, leaving 240 potential respondents that could have been drawn on in reserve. Of these, 3 interviews were either terminated before the discrete choice experiment or contained significant problems; as a result data from 999 respondents were available for analysis.

4.1.2 **Second pilot survey**

As no significant changes were made between the second pilot survey and the main survey, the decision was taken to combine the two datasets to provide a larger sample for analysis.

This provided an additional 99 respondents, increasing the total sample size to 1,098 respondents.

4.2 **Comparison of sample with General Household Survey**

In order to judge the degree to which the survey sample represented the population demographics of those with recent experience of an outpatient visit, comparisons were made with the General Household Survey (GHS).

The GHS is a continuous national survey of people living in private households, conducted on an annual basis by the Social Survey Division of the Office for National Statistics. Within this survey are questions on whether respondents have attended an outpatient appointment within the previous three-month period. The Department of

Health collated this data from the past four years and produced tables that set out the demographic breakdown of those who stated they had attended outpatient appointments.

We would anticipate some differences in demographics between the GHS sub-sample and our survey as the time-frames for the two outpatient attendance questions are different. The GHS asks about appointments that have occurred within a three month period, and the current survey focuses on referrals that have occurred within the past five years.

Table 8 shows that the gender split in the two surveys. It is notable that the number of women interviewed during the current survey is 10% higher than that in the GHS.

Gender	GHS		Survey	
<i>female</i>	7580	55%	712	65%
<i>male</i>	6220	45%	386	35%
<i>Total</i>	13800	100%	1098	100%

Table 8: GHS – survey comparison: gender

Table 9 compares the employment distribution. Generally, the two surveys are in agreement. The most significant differences are for those people “*not looking for work*”, those who are “*unable*” to work and those classified as “*retired*”.

Employment	GHS		Survey	
<i>Working ft</i>	4638	34%	336	31%
<i>Working pt</i>	1780	13%	177	16%
<i>Student</i>	277	2%	20	2%
<i>Looking for work</i>	320	2%	8	1%
<i>Not looking for work</i>	1451	11%	28	3%
<i>Unable</i>	126	1%	80	7%
<i>Retired</i>	4304	31%	408	37%
<i>Looking after home</i>	888	6%	28	3%
<i>missing</i>	16	0%	13	1%
<i>Total</i>	13800	100%	1098	100%

Table 9: GHS – survey comparison: employment

Table 10 compares the socio-economic distributions using the socio-economic group definition. It should be noted that in the GHS data there is approximately 6% of the sample without a classification; it is not clear whether this is systematic across all groups or whether there are specific groups that are under-reporting. Bearing this in mind, it appears that the samples generally agree except for groups B and C1: group B contains 25% of the sample in the GHS but only 19% in the survey. On the other hand, the share of group C1 is 22% in the GHS and 30% in the survey.

SEG	GHS		Survey	
A	503	4%	54	5%
B	3455	25%	213	19%
C1	3050	22%	331	30%
C2	2872	21%	223	20%
D	2198	16%	165	15%
E	892	6%	112	10%
missing	830	6%	0	0%
Total	13800	100%	1098	100%

Table 10: GHS – survey comparison: SEG

Table 11 compares the distributions of household income across the surveys. Here we are examining gross household income, defined for the benefit of the survey respondents as “the income of all those in the household (before tax and national insurance) and including any pensions, benefits or extra earnings”. The number of records with missing data (including “*don't know*” and “*refuse to respond*” answers) is much higher in the current survey (22% compared with 12% in the GHS). The largest difference is in the income band “less than £10,000”, where the current survey contains substantially fewer respondents from households with income less than £10,000 per annum.

Income	GHS		Survey	
<i>less than 10000</i>	3079	22%	177	16%
<i>10000 to 19999</i>	2947	21%	241	22%
<i>20000 to 29999</i>	2182	16%	183	17%
<i>30000 to 39999</i>	1512	11%	114	10%
<i>40000 to 49999</i>	955	7%	56	5%
<i>50000 or more</i>	1470	11%	83	8%
<i>missing</i>	1655	12%	244	22%
Total	13800	100%	1098	100%

Table 11: GHS – survey comparison: income

The age bands in the survey were different from those in the GHS tables provided by the Department of Health. For this reason it is not possible to compare them directly. Table 12 and Table 13 show the age bands and their distributions for the two surveys.

Age band	GHS	
<i>16 to 24</i>	1274	9%
<i>25 to 30</i>	1032	7%
<i>31 to 45</i>	3346	24%
<i>46 to 59</i>	3032	22%
<i>60 to 79</i>	4104	30%
<i>80 or older</i>	1012	7%
Total	13800	100%

Table 12: GHS – survey comparison: age (GHS)

Age band	Survey	
16 to 24	14	1%
25 to 29	43	4%
30 to 44	241	22%
45 to 59	368	34%
60 to 64	160	15%
65 to 79	243	22%
80 or older	29	3%
Total	1098	100%

Table 13: GHS – survey comparison: age (survey)

The two distributions are broadly similar, however, it should be noted that for the purposes of this survey the market research company only contacted people over the age of 21; it is therefore not surprising that the proportion of the sample falling into the “16 to 24” band is significantly smaller.

In general we conclude that on the key demographics, the recruited sample is broadly similar to the referred population, with the most noticeable differences being in gender and employment. This does not directly impact on the modelling, but would be a consideration if the sample were to be used for forecasting purpose; at which point it would be necessary to weight the sample to reflect better the estimates of the referred population profile. No weighting has been carried out for the purposes of the results reported here, however.

4.3 Rating information collected

Given practical limitations on the discrete choice experiment noted earlier, the DCE only tested an aggregated rating across five different domains of information (excluding information relating to travel, waiting times and GP advice). However, in real life patients will be able to access information at a more detailed level. The restriction was imposed by the size of the experimental design that could practically be undertaken.

In order to gain a better insight into people's preferences, in addition to the DCE questions, respondents were also asked to rate the importance of the five performance/facilities domains in the first sublevel plus, for completeness, the other DCE factors - waiting times, travel etc.

4.3.1 Summary across domains

This section presents the rating results aggregated by the various domains. The domains considered were:

- Travel: Travel time and cost to the hospital
- Domain A: Convenience and efficiency
- Domain B: Hospital facilities, standards and food
- Domain C: Personal experience of care
- Domain D: Impact on health

- Domain E: Waiting times from referral to treatment (if required)
- GP opinion of hospital

The importance of each item within the domain was rated on a scale from 1 to 5, where “1” was extremely important and “5” was not particularly important.

Figure 4 shows the average importance given by the respondents to the items within each of the domains. Only 20% of people think that travel issues were extremely important. Around 35% of respondents consider “convenience and efficiency” and “hospital facilities, standards and food” to be extremely important, while this number goes up to 45% for “personal experience of care”. 75% of respondents considered the impact on their health to be extremely important. Finally, 60% percent of respondents considered both waiting times and their GP’s opinion to be extremely important.

The following sections focus on each of the domains in turn and explore how respondents rate the aspects contained in each domain.

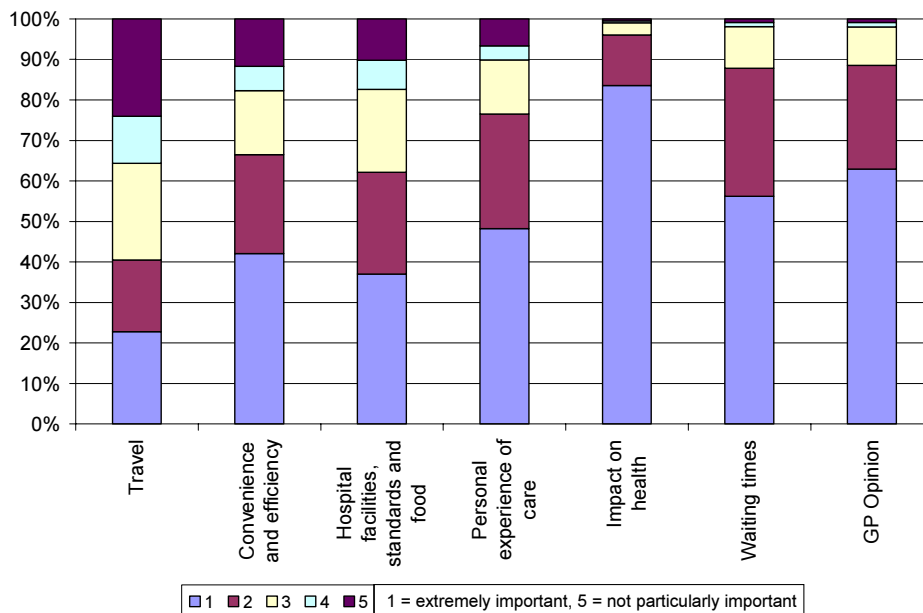


Figure 4: Average rating within each domain

4.3.2 Travel – Travel time and cost to the hospital

Figure 5 shows that almost 30% of respondents rated travel time to be extremely important, some by car and some by public transport. On the other hand, only 15% rate the travel cost to be extremely important.

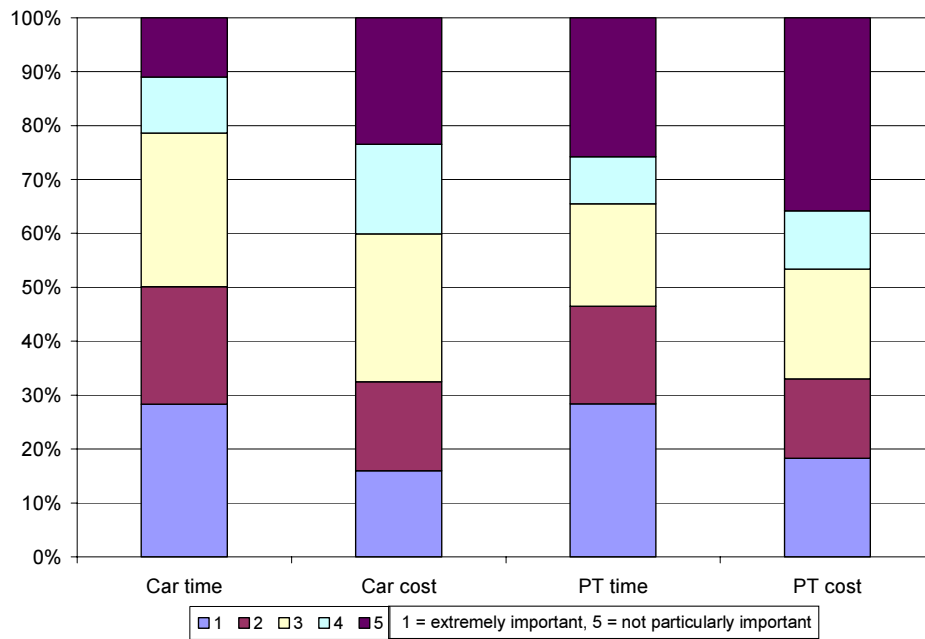


Figure 5: Ratings for travel time and cost

4.3.3 Domain A – Convenience and efficiency

Figure 6 shows that the keeping of outpatient appointments, and in particular of appointment for surgery, was considered to be extremely important by around 65% of respondents.

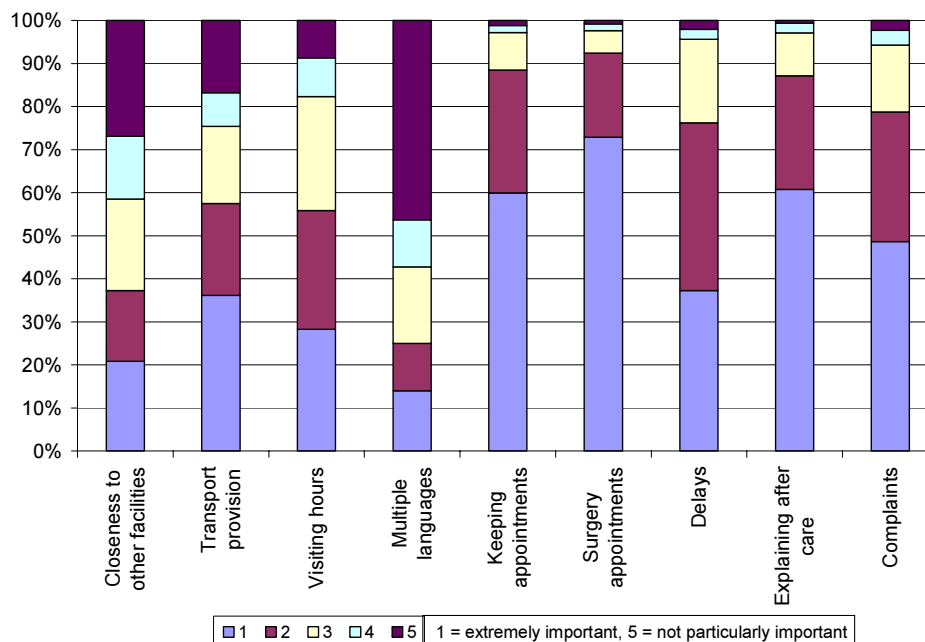


Figure 6: Ratings for convenience and efficiency

In addition, the ability of the hospital to explain how any after-care will be arranged was rated extremely important by 60% of respondents. When looking at the top two bands,

both how well the hospital deals with complaints and the incidence of delays are rated relatively highly. Finally, the following categories were considered to be less important by the respondents: the transport provision, the closeness of the hospital to other facilities, their flexibility on visiting hours and the ability to provide information in foreign languages.

4.3.4 Domain B - Hospital facilities, standards and food

Figure 7 presents the results for “hospital facilities, standards and food”. More than 85% of respondents considered the general cleanliness of the hospital to be extremely important. The standard of the rooms and the availability of disabled facilities were extremely important for about 40% of respondents. Less than 15% of respondents considered the availability of a prayer room as well as phones and TV’s to be extremely important.

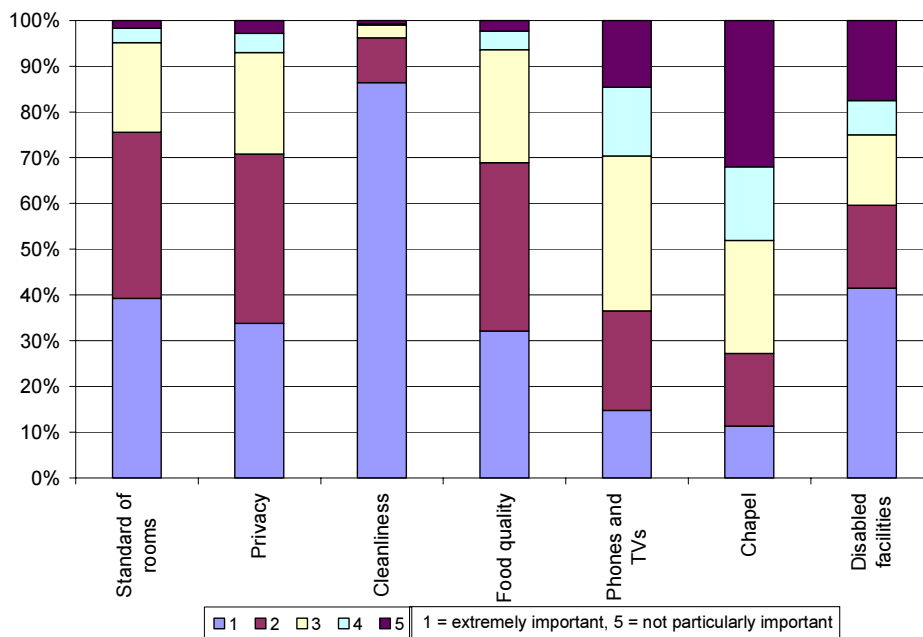


Figure 7: Ratings for hospital facilities, standards and food

4.3.5 Domain C – Personal experience of care

Figure 8 presents the results for “personal experience of care”.

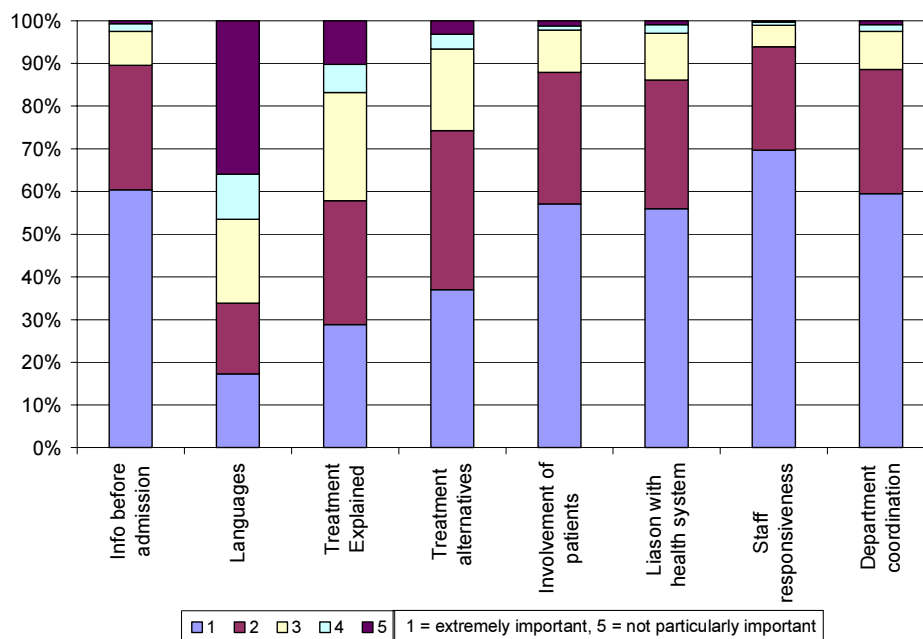


Figure 8: Ratings for personal experience of care

The most important categories appear to be: the information provided before admission to the hospital, how responsive the staff are, the coordination among departments, the extent to which the medical staff involved the patients, and how well the hospital liaises with the other parts of the health system. Finally, less importance (around 10-35% say extremely important) was given to the availability of treatment alternatives or the explanation of those treatments, and the range of languages offered.

4.3.6 Domain D – Impact on health

Figure 9 presents the results for “impact on health”. As noted earlier, respondents considered this domain to be the most important overall compared with other domains. In this figure we see that all but one (i.e. side-effects after treatment) were considered to be extremely important by at least 80% of respondents. In particular, low mortality rates, readmission rates and hospital-acquired infection rates were considered to be extremely important by around 90% of respondents.

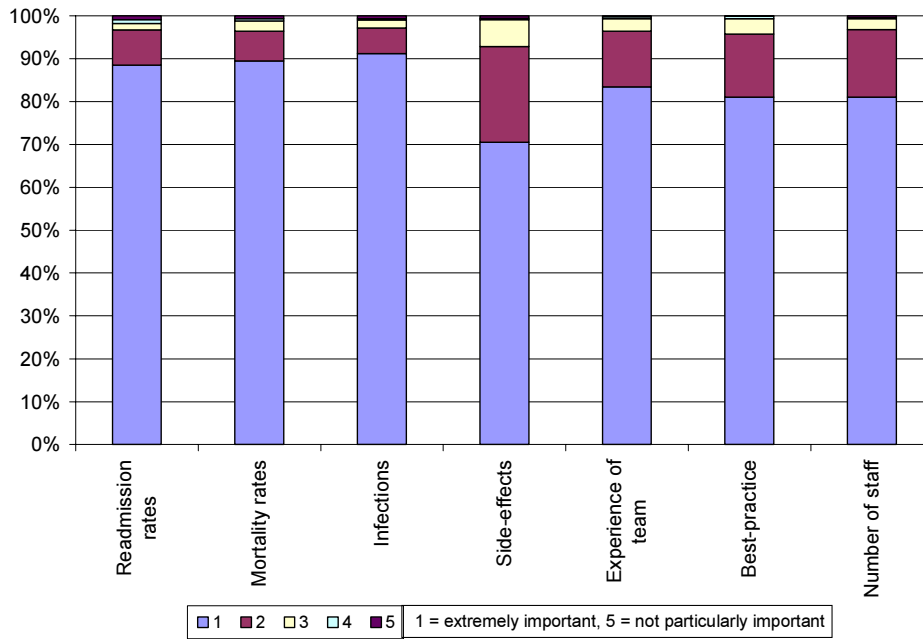


Figure 9: Ratings for impact on health

The next two figures breakdown the valuation of changes in “impact on health” according to whether information is “based on the performance across all procedures and all clinical teams within the hospital” or was “based on the performance for the procedure that you were referred for and the clinical team which would treat you within the hospital”.

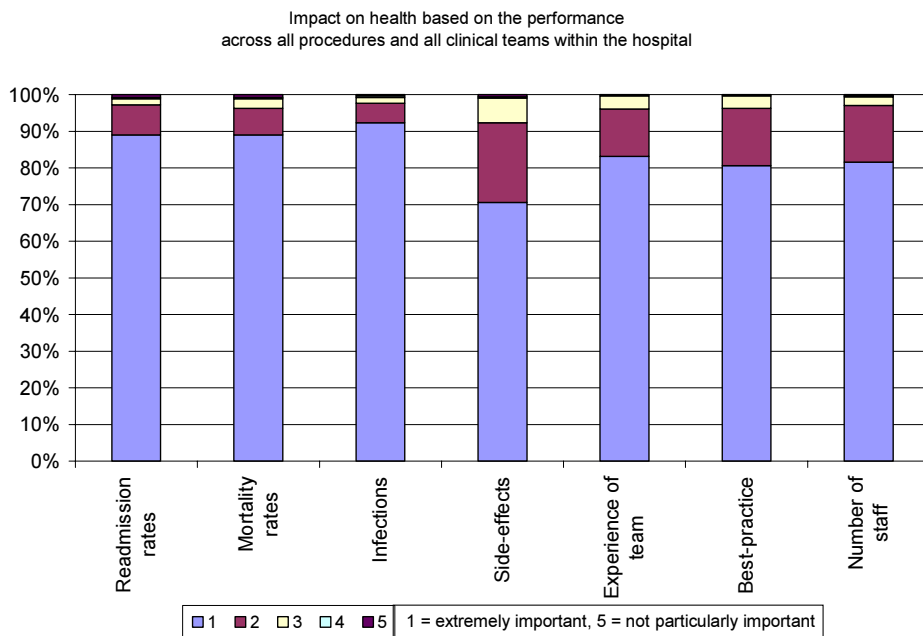


Figure 10: Ratings for impact on health for all teams

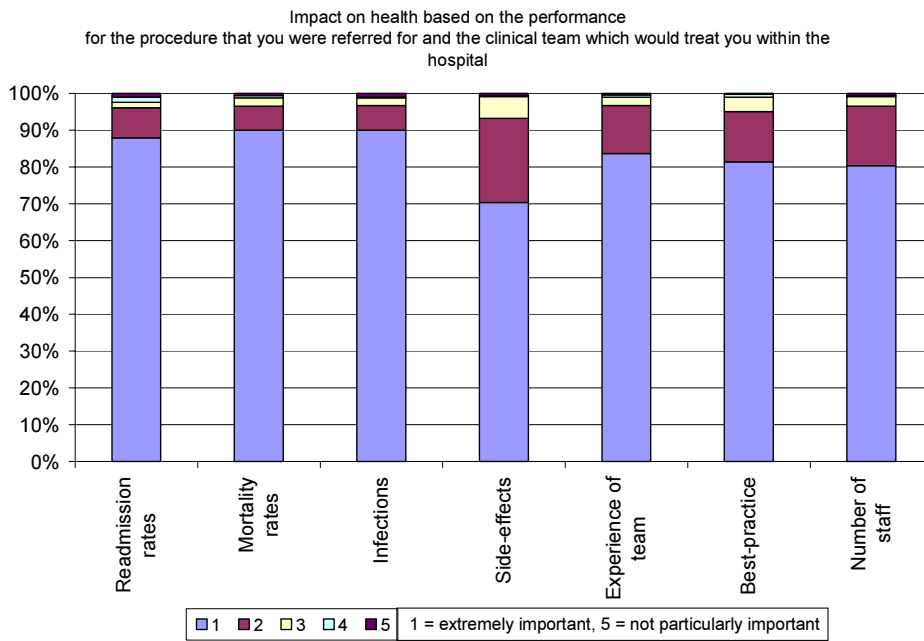


Figure 11: Ratings for impact on health for team that would treat you

These two figures show little difference between the ratings obtained from the two groups of respondents.

4.3.7 Domain E – Waiting times

Figure 12 shows that around 55% of respondents consider information on waiting times to be extremely important, with only 1% of respondents considering it to be not particularly important.

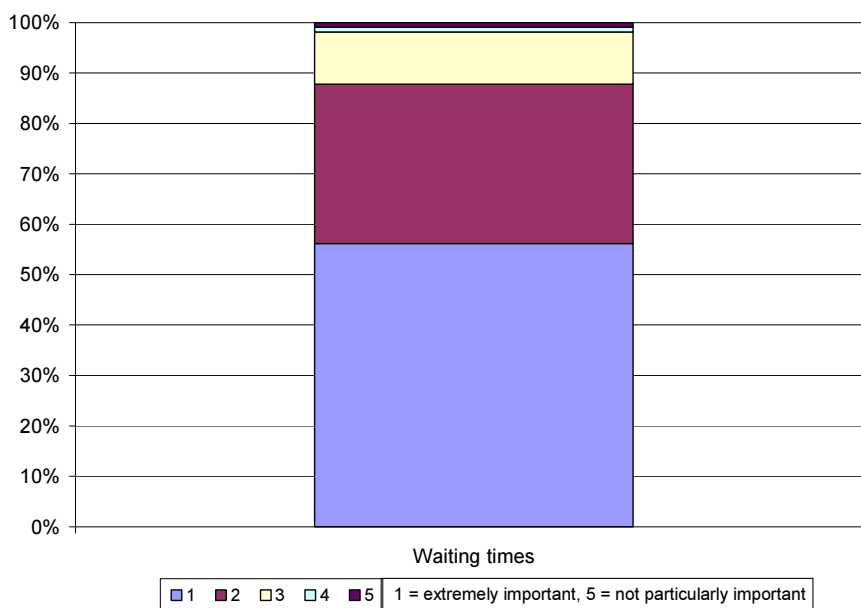


Figure 12: Ratings for waiting times

4.3.8 GP opinion of hospital

Figure 13 shows that more than 60% of respondents considered the GP's opinion of the hospital to be extremely important. The number of respondents decreased exponentially as the ratings went down.

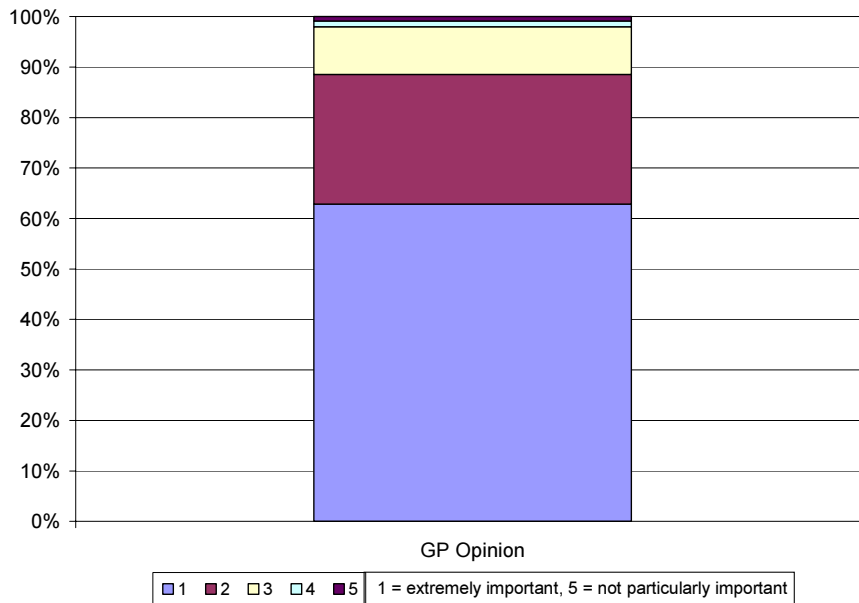


Figure 13: Ratings for GP opinion

Whilst these ratings provide some interesting insights, it should be remembered that in these questions the respondents do not have to trade-off factors against each other, and that the scale between respondents can vary (i.e. one person's "1" rating may be another person's "2" rating etc).

4.4 Information on impact on health

In addition to the ratings reported above in section 4.3.6, and the discrete choice experiment evidence reported later in section 5.3.1, each respondent was asked a question explicitly about their views concerning the *level* at which information on the impact on health should be available. This question asked:

Concerning information on the "impact on your health", i.e. the hospital success rates, would you prefer to receive information on the performance across all procedures and all clinical teams within the hospital, or information for the procedure you were referred for and the clinical team which would treat you

- 1 All procedures and all teams
2. Your procedure and the team that would treat you
3. Don't mind
4. Don't know

The responses to this question are presented in Figure 14.

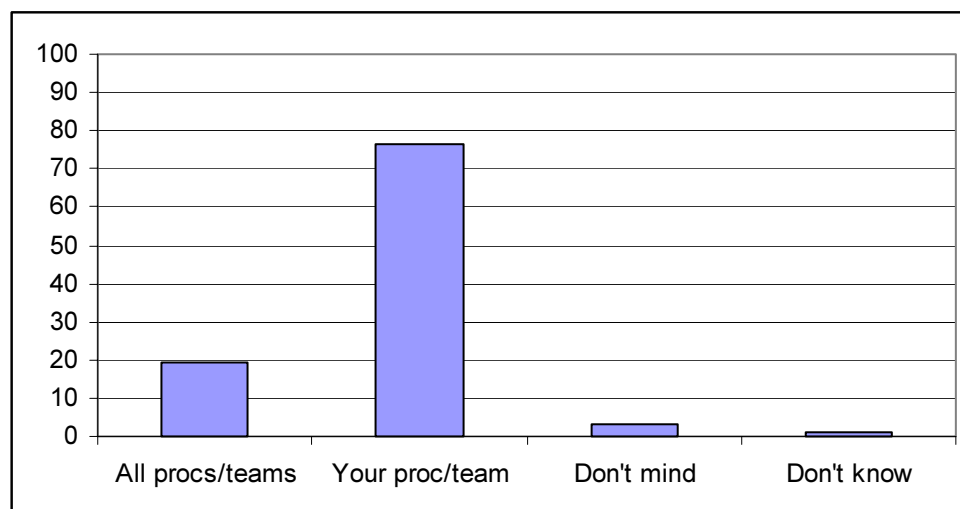


Figure 14: Preferences for information on impact on health

This evidence suggests that the vast majority of respondents would prefer information that was targeted to the procedure and team that would treat them, although interestingly, approximately 20% would rather have more general information about all procedures and all teams.

In comparing these results with those from the ratings and discrete choice experiment, it is important to remember that in the latter approaches each respondent was only asked to consider one of the options, but in this question they were asked to compare the two. The balance of the evidence therefore suggests that the majority of respondents would prefer to have information on impact on health at the level of their procedure and team, but that when considering changes in the level of the domain score, respondents value the differences between scores in very similar ways.

The results from this and the ratings questions are further explored in Chapter 6, which deals with the policy and other interpretations of these findings in conjunction with the results of the DCE modelling.

4.5 Feedback on the discrete choice exercise

Discrete choice experiments of the complexity of those used in this study present respondents with quite a task in terms of the information they are asked to consider in making their choices - as the sample question from this survey indicates (see Figure 3, earlier). It is therefore important to establish respondents' degree of understanding of the questions asked and the nature of the task they are being asked to undertake. A number of questions about the experiments were therefore asked.

Details of the results from these questions are contained in Appendix G. In summary, however:

- 80% of respondents agreed that the alternatives offered in the choice scenarios were realistic;

- the majority stating the alternatives were *unrealistic* referred to a lack of credibility in the travel times;
- 97% of respondents stated that they understood all the characteristics or attributes describing the hospitals in the choices offered;
- 95% of respondents looked at "...all the characteristics for the hospitals in the choices.";
- 33% of respondents said that the "impact on their future health" was the most important characteristic in deciding which hospital to choose; for 22%, the most important was patient treatment and care;
- 92% stated that these choices reflect how they might make their decisions if they had to choose between hospitals in real life .

Overall, we would judge that there is unlikely to be any significant distortion or bias in this research arising from respondents' misunderstandings of the DCE questions and process.

4.6 Trading behaviour in discrete choice experiment

4.6.1 Respondents consistently choosing one hospital

Establishing the degree of 'trading behaviour' in the DCE is important; if, for example, respondents consistently choose the 'local' hospital this would indicate a failure of the design of the DCE in terms of the attributes/levels respondents were asked to consider in making their choices. It would also mean that there was little or no useful information to underpin the modelling of choice behaviour.

In this survey, however, enough respondents engaged in trading between hospitals to suggest that the DCE design was successful and hence to provide enough information to build the DCE models reported in Chapter 5.

The Venn diagram in Figure 15 summarises the stated preference choice behaviour of the 1,098 respondents across their eight choice scenarios.

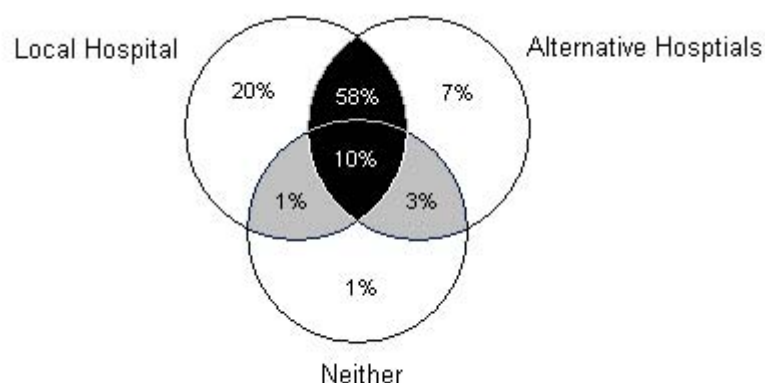


Figure 15: Venn diagram summarising choices between hospital (sample size = 1,098)

In detail, the two black segments – covering 68% of the sample - provide the most information on the trade-offs patients make when considering alternative hospital providers.

The grey segments provide less information on patient trade-off behaviour because in these cases the respondent consistently chose between one hospital and the “neither” alternative. This is still valuable information, particularly for the neither choice.

The white segments reflect cases where the respondent stated that they would always choose one of the alternatives. A response of always choosing one option is a valid response and reflects a preference for one alternative under all of the choices offered. It should be noted here that the “*Alternative Hospitals*” section represents all four of the alternative hospitals, and the 7% in this white segment are those respondents that consistently choose any of the alternative hospitals over their local hospital.

Only thirteen respondents always chose “neither” (just over 1%) – these may be considered political responses in which the respondents may not have felt that anything put forward by the NHS would be sufficient. These thirteen cases where the respondent consistently answered “neither” in each choice were excluded from the models analysis as they were judged to not to be “playing the game”. Twenty percent of the sample always chose the current “local” hospital alternative. In the SP model analysis (see Chapter 5), further tests were performed to examine whether particular groups of patients had a stronger underlying preference for staying with or moving away from their local hospital.

4.6.2 Respondents consistently choosing one mode of transport

The Venn diagram in Figure 16 summarises the stated preference choice behaviour of the 1,098 respondents across their eight choice scenarios, but this time examines the mode of transport chosen.

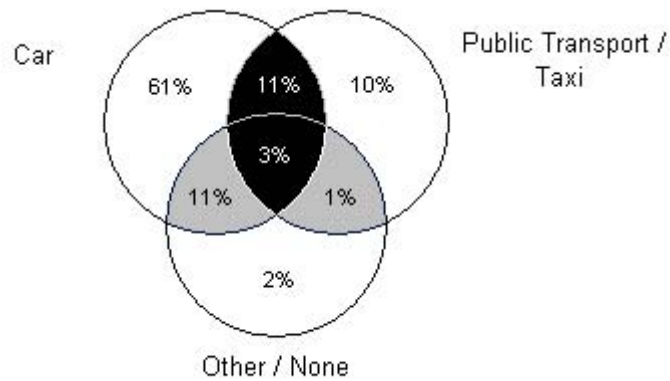


Figure 16: Venn diagram summarising choices between transport modes (sample size = 1,098)

71% of the respondents consistently chose to travel by the same mode of transport to the hospital, regardless of how far away it was. The “*Other / None*” section of this diagram reflects the situations where the respondent either states they would use another form of transport, or chooses not to be referred to one of the NHS hospitals offered. As a result, the grey segments also include some respondents that only ever travel by one mode but sometimes choose not to be referred. The 14% of the respondents in the black segments change their chosen mode of transport according to the travel times and costs presented in the scenarios.

This data suggests that a large proportion of respondents do not tend to change their mode of transport according to the relative travel times and costs. This is not to say that respondents are necessarily insensitive to travel times and costs, as they may choose a hospital that has lower associated travel times and costs; the evidence from this piece of analysis simply shows that a large proportion of the patients consistently choose to travel by the same mode.

5.1 Introduction

As set out in Chapter 2, we can build discrete choice models using the data from the stated preference experiment to gain insight into what drives the decisions that individuals make when faced with a range of choices of hospital.

In the case of this study, the respondent was asked to choose between the local hospital and four alternative hospitals (each of which had a choice of mode); they also had the option of choosing private treatment or declining referral. As a result the choice model contained twelve utility functions, one for each of the alternatives:

1. Local hospital – travel by car
2. Local hospital – travel by public transport / taxi
3. Alternative hospital 1 – travel by car
4. Alternative hospital 1 – travel by public transport / taxi
5. Alternative hospital 2 – travel by car
6. Alternative hospital 2 – travel by public transport / taxi
7. Alternative hospital 3 – travel by car
8. Alternative hospital 3 – travel by public transport / taxi
9. Alternative hospital 4 – travel by car
10. Alternative hospital 4 – travel by public transport / taxi
11. Treatment outside of the NHS
12. Decline referral

In each choice scenario the respondent was asked to indicate which one of the twelve they would choose.

The utility functions for each alternative reflect the levels of each of the attributes that were present in the choice that they faced. Each term in the model is multiplied by a coefficient (β_x) which reflects the size of its impact on the decision making process.

For example, a simple utility function for the alternative “*local hospital – travel by car*” may be:

U(local_car)	= $\beta_{\text{traveltime}}$	* travel time to hospital
	+ $\beta_{\text{travelcost}}$	* travel cost to hospital
	+ β_{DomainA}	* rating of DomainA for hospital
	+ β_{DomainB}	* rating of DomainB for hospital
	+ β_{DomainC}	* rating of DomainC for hospital
	+ β_{DomainD}	* rating of DomainD for hospital
	+ β_{wait}	* hospital waiting time
	+ $\beta_{\text{GPrecommend}}$	* GP recommends hospital (relative to no advice)
	+ $\beta_{\text{GPagainst}}$	* GP advises against hospital (relative to no advice)
	+ β_{GPgood}	* GP rates hospital as good (relative to rated as neutral)
	+ β_{GPbad}	* GP rates hospital as bad (relative to rated as neutral)
	+ $\beta_{\text{GPunknown}}$	* GP rates hospital as unknown (relative to rated as neutral)

Figure 17: Example utility function

It is the model coefficients (β_x) that are estimated in the model calibration procedure. These coefficients are common across utility functions, i.e. the value placed on a domain rating on one hospital is not different to the value placed on the same rating at a different hospital.

In addition, a constant is placed on the local hospital alternative to measure the additional value associated with that alternative being the local provider. Two constants were also added to the utility functions corresponding to the mode of transport chosen (one for public transport, and one for taxi), these captured any difference in value placed on identical journeys but made by different modes.

The model is based on the assumption that each respondent chooses the alternative that provides them with the highest utility. An error term is included on each utility function to reflect unobservable factors in the individual's utility. The estimation can therefore be conducted within the framework of random utility theory, i.e. accounting for the fact that the analyst has only imperfect insight into the utility functions of the respondents (McFadden, 1974).

Initially, a series of multinomial logit (MNL) models were estimated and in the latter stages of development more complex nested logit (NL) models were tested. These are described further in the following sections.

All the models within this report were estimated using the Alogit software package, a widely used package for estimating models within the logit model family (Alogit 4.2, 2005).

5.2 Checks on aspects of experimental design

The analysis of the data collected during the first pilot survey showed signs that the respondents' behaviour may be influenced by the position of the alternatives in the choice set. In particular, the evidence from this small sample suggested that everything else being equal, the hospitals to the left seemed to be chosen more frequently. Figure 18 shows the

results from the first pilot survey. It can be seen that within each of the eight choice options, the leftmost hospitals (the first two bars in each set) seem to be chosen more frequently.

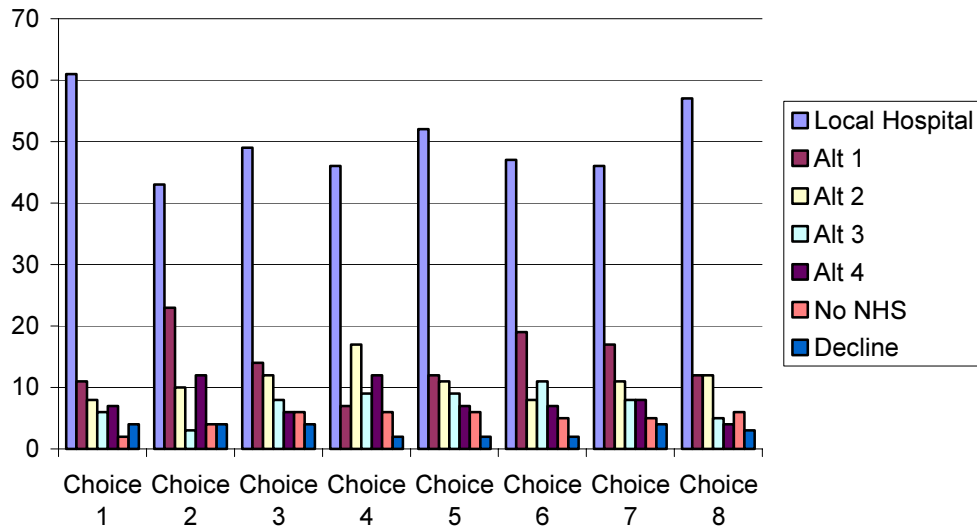


Figure 18: Choices made during the first pilot

In order to better isolate the impact of the position of the hospital in the choice from the “local” characteristics, the position of the local hospital in the choices was varied, so that it did not always appear on the left. This change allowed the estimation of constants relating to hospital position as well as the “local” branding.

The suggestion of an ordering effect in the hospital alternative led to a question as to whether there may also be an ordering effect in the presentation of the variables (i.e. is there greater emphasis on the travel times and costs that currently appear as the first variables on the choice cards). It was therefore decided to also move the position of the three blocks of variables (travel information, hospital information, and GP advice) on the choice cards.

With a far larger data set and an experimental design that was now tailored to allow a systematic evaluation of these “ordering” issues it was possible to run some checks within the discrete choice model to evaluate whether there was any evidence of statistically significant effects.

Following investigation (see Appendix H), there were some cases where the position of the variable/hospital initially appeared to have an impact, however, once the confidence intervals of the estimates were taken into account we saw no statistically significant effects confirming increasing (or decreasing) valuation.

5.3 Development of Multinomial Logit models

A series of models were developed to explore whether there were modifications to the utility functions that could improve the fit of the model to the data. These tests were

conducted on a multinomial logit model (MNL), where independence from irrelevant alternatives is assumed, i.e. proportional substitution between alternatives.

A number of different tests were conducted, examining both the potential for non-linear valuations of key variables and differences in valuation between different groups of respondents.

5.3.1 Non-linear valuations of domains

In the initial choice model the value of the ratings of the domains was represented by a set of linear terms. This formulation assumed that a respondent would place the same value on an improvement of one point, be it from a rating of one to two, or four to five. The validity of this assumption was tested by estimating separate coefficients for each point improvement on each of the domains. The results of these checks on an interim model are shown in Figure 19. From this it can be observed that the valuation of the domains is actually unlikely to be linear, although the confidence intervals of each of the point estimates needs to be taken into account.

The standard errors on the coefficients were therefore examined to determine which groups of coefficients were likely to be statistically significantly different, and this information was used to guide the estimation of a series of models to finalise the best functional fit.

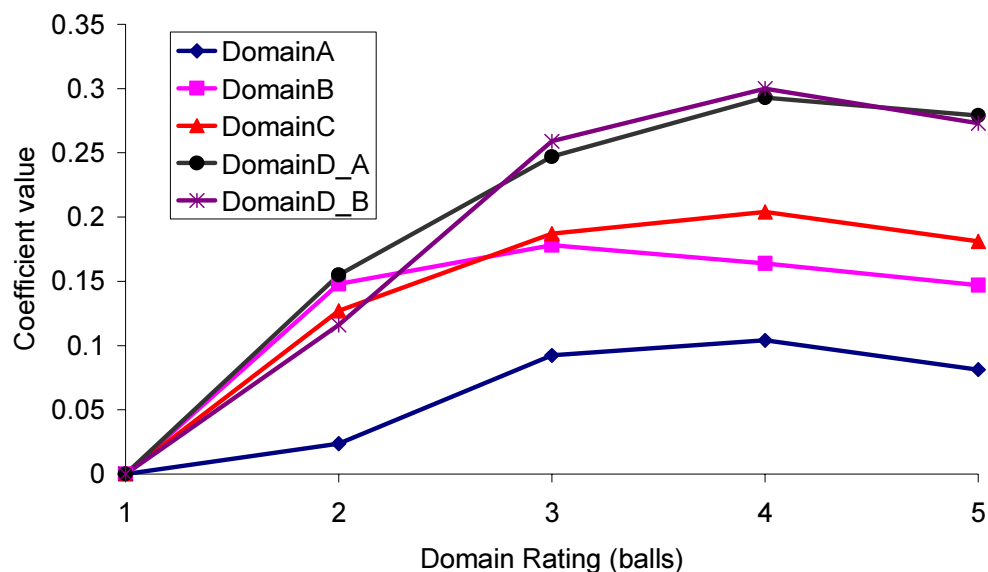


Figure 19: Coefficient values for point improvements on each domain (interim model)

The final model uses a bi-linear representation for each domain, with an initial steep slope for the ratings in the range 1-3 (well below average – average), and then a second shallower slope for the ratings in the range 3-5 (average – well above average). This was found to provide the best fit to the observed data, and suggests that there are diminishing returns once the rating passes a threshold of three. The gradient of the two slopes in the bi-linear representation of each of the domains is estimated within the model, and are different for each of the five domains.

An additional point that can be observed from Figure 19 is the consistency in the valuation of changes in “impact on health” (Domain D), regardless of whether this was “based on the performance across all procedures and all clinical teams within the hospital” (*DomainD_A*) or was “based on the performance for the procedure that you were referred for and the clinical team which would treat you within the hospital” (*DomainD_B*).

5.3.2 Non-linear valuations of waiting time

In the initial choice model the value of the waiting times from time of referral to final treatment were also initially represented by a linear term. This formulation assumed that a respondent would place the same value on an improvement of one week, be it from a waiting time of six weeks to seven, or twenty-six weeks to twenty-seven. The validity of this assumption was again tested by estimating separate coefficients for each point improvement in waiting time. The results of these checks on an interim model are shown in Figure 20. It should be noted that in this case the coefficients estimated represent the gradient at each point, hence constant values represents a constant gradient.

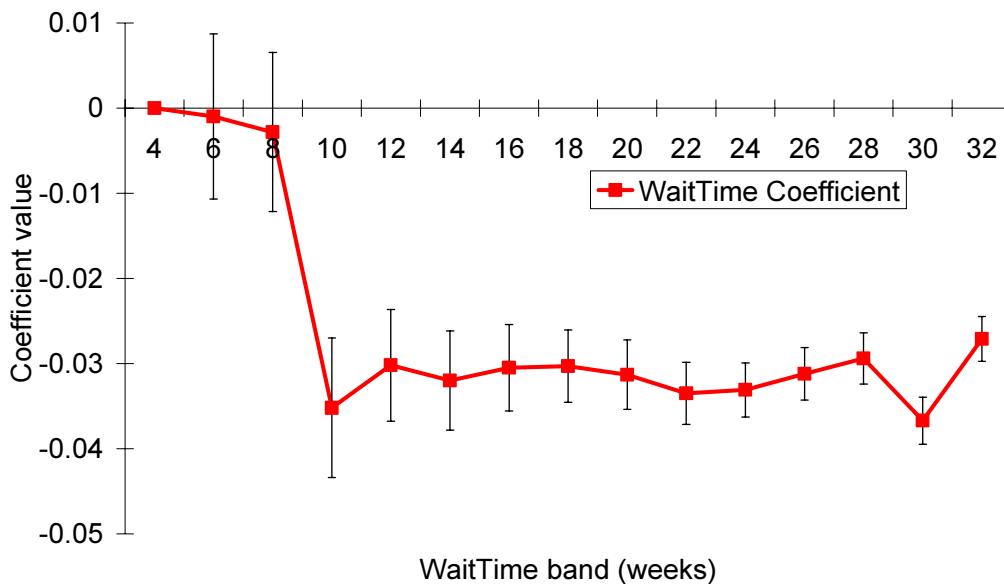


Figure 20: Coefficient values for gradient of WaitTime, bars reflect the 95% confidence interval (interim model)

From this figure it can be observed that there are two distinct regions in the valuation of waiting times. For waiting times of 8 weeks or less, a change in waiting time is valued as zero. That is to say, on average there is no benefit from reducing the waiting time from referral to treatment below 8 weeks. Once the waiting time reaches 10 weeks, there is, however, a step change where the increases in waiting time are valued negatively (and significantly different from zero). It can be seen that the rate of change is relatively constant, implying that for waits of 10 weeks and above the valuation of waiting time increases approximately linearly.

The final model therefore uses a step function for waiting time valuations where the low values of waiting time (less than 10 weeks) are valued at zero, with a step change at 10 weeks that then continues at a constant gradient, as illustrated in Figure 21.

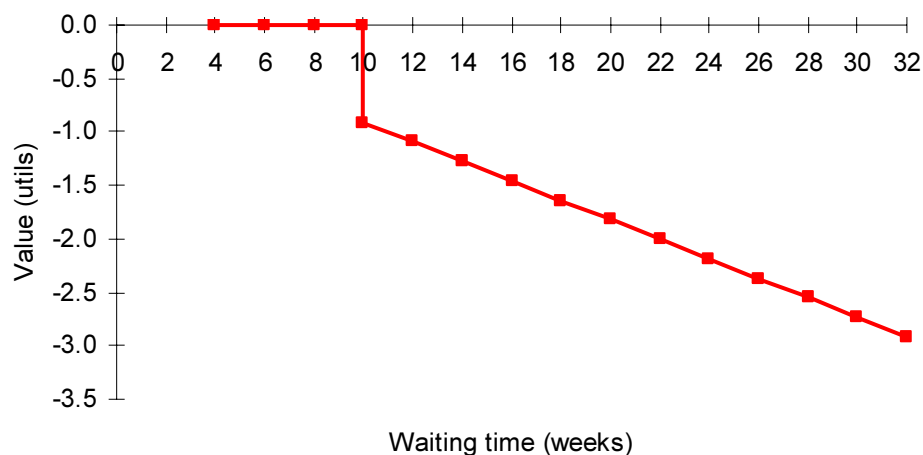


Figure 21: Best fit to valuation of waiting time

5.3.3 Non-linear valuations of travel time

We have also run tests to examine whether travel times were valued linearly. Tests suggested that a bi-linear formulation provided a better fit, with an initial steep slope for travel times under one hour and a shallower slope for travel times over one hour. This bi-linear function was found to provide the best fit for all three transport modes (car, PT and taxi), although the coefficients estimated to fit these functions were different on each mode.

5.3.4 Refunding of travel costs

During the model development we tested whether those that were already eligible for their travel costs to be refunded placed a different value on travel costs to those that have to pay. This revealed that we could estimate two statistically different coefficients for these two groups of respondents, with the best fit obtained when we use linear coefficients for cost. Both of the estimated coefficients are negative, indicating that respondents prefer lower costs.

It is notable that those respondents that were told that they would be entitled to refunds of their travel costs, can be observed to still place a significant negative value on increasing travel costs. One potential explanation for this is that the costs would not be free at the point of travel, but would be refunded. Typically, those entitled to repayment of their travel costs are on benefits or lower incomes, and may not have access to the disposable income necessary to pay upfront for the larger travel costs.

Within the choice exercises, some situations offered refunding of travel costs to those respondents that were not already entitled to refunding of travel costs (under the HTCS). Two separate coefficients were examined on the cost term for these respondents; one relating to the valuation of travel cost when the respondent is paying, and one relating to the valuation of travel cost when the costs are refunded. This model showed that there was

no significant difference between these two cases, and as a result a single cost term was retained which was applied to the travel cost regardless of refund.

There was no evidence of any increasing benefit from having costs refunded, so we tested one additional formulation where a constant was applied for the situation where the cost was refunded, relating to a one-off benefit from having the refund (independent of the size of the refund). This constant was also not found to be statistically significant.

Drawing on this evidence we can conclude that the refunding of travel costs to those that are not already eligible for cost refunds is unlikely to act as an incentive to move to an alternative provider.

5.3.5 **Tests on differences according to socio-economic circumstances and reasons for referral**

In developing the models we were interested in whether different groups of respondents placed different valuations on any of the attributes. To identify possible differences we examined cross tables that summarised the in-sample predictive ability of the model. This approach allowed us to approach the problem in a systematic and thorough way. Through using such an approach we could also satisfy ourselves that the model we developed addressed the key differences within the sample.

These tests were conducted on a comprehensive list of background variables, which are listed in Figure 22, the coding frames for which are detailed in Appendix C.

These tests identified a number of differences in the valuation of the attributes, namely differences in the sensitivity to car travel times by household income group and the value placed on "impact on health" according to education level.

A number of income tests were conducted on travel costs but these did not reveal any statistically significant effects, although it should be noted that those on lower incomes were entitled to travel cost refunds and this group was found to be slightly more cost sensitive.

- gender	- whether in pain at time of referral
- age	- whether anxious at time of referral
- marital status	- rating of health at time of visit to GP
- number of children in household	- ability to drive at time of referral
- number of adults in household	- ability to travel long distances at time of referral
- education level	- how seriously perceived illness at time of referral
- household income	- whether anticipated would need an operation at time of referral
- employment status	- whether expected to need an overnight stay
- social economic group classification	- number of nights anticipating in hospital
- whether able to drive	- whether expected to need follow-up visits
- whether able to travel long distances	- reason for referral
- number of cars in household	- how many times been to GP before for same problem
- whether a car would be available for transport to a hospital	- whether referred to local hospital
- whether there would be a viable PT option to travel to a hospital	- how often have been to local hospital both before and since
- ethnic group	- how would typically travel to local hospital
- whether have access to internet	- whether entitled to free transport through PTS
- whether live in a rural or urban area	- whether entitled to travel cost refunds under HTCS
- mobility	- whether go to hospital on own
- ability to care for self	- rating of local hospital
- ability to perform usual activities	- whether have private health insurance
- whether in pain	- whether considered private treatment at referral
- whether anxious	- how long expected to have to wait for referral
- whether suffering from a chronic form of illness	- whether still waiting for referral
- whether a smoker	- how long actually waited
- rating of current health	- whether ended up requiring operation
- travel time to local hospital by car	- type of operation required
- travel cost to local hospital by car	
- travel time to local hospital by PT	
- travel cost to local hospital by PT	
- number of time referred in past 5 years	
- how often visit GP	
- whether typically see same GP	
- when referral in question occurred	
- mobility at time of referral	
- ability to care for self at time of referral	
- ability to perform usual activities at time of referral	

Figure 22: Background variables tested in model development

5.3.6 Accounting for underlying preferences for and against the local hospital

In addition to the differences identified in the valuation placed on the attributes, we undertook a series of tests to examine whether different groups of respondents demonstrated a greater underlying preference for or against the local hospital alternative. This was also supplemented with tests to see whether certain groups were more likely to choose the options to obtain treatment outside of the NHS or decline referral. To identify these constants we again examined cross tables that summarised the in-sample predictive ability of the model. These tests were conducted on the same comprehensive list of background variables, listed previously in Figure 22.

These tests revealed that the respondents that were more likely to choose to stay at the local hospital were:

- those that typically travel by bus;
- those that live in the suburbs of a city or large town; and
- those rated their health as fair or worse.

In addition, the tests revealed that there were some groups of respondents that were less likely to stay at the local hospital. These groups were:

- those that had visited their GP more than 10 times for the same problem;
- those that rated their local hospital as bad or worse;
- those respondents that have access to the internet;
- those that anticipated they would have needed a major operation; and
- those respondents without a formal education.

Unsurprisingly, we also identified that those respondents with private health insurance were more likely to choose to go to a provider outside of the NHS. In addition we observed that male respondents were less likely to consider this option.

5.4 Testing of Nested Logit models

By using a nested logit (NL) model, which also falls within the generalised extreme value family, we are able to introduce nests of alternatives. These allow us to test for evidence of different substitution patterns between hospital and travel mode alternatives (Train, 2003).

5.4.1 Tests on different tree structures

A number of different nested logit models were tested. The best model fit (as judged by the model likelihood, and whilst still consistent with utility theory, i.e. structural parameters with values between 0 and 1) was obtained by allowing for two different substitution patterns. The first shows there is greater substitution between modes of transport than hospitals (i.e. the mode of transport comes below the hospital in the tree). The second shows there is greater substitution between the four alternative hospitals; this shows that when comparing alternatives, two alternative hospitals are considered to be more alike than an alternative hospital against the local hospital.

A choice of transport modes was not offered for those choosing a private hospital, or choosing not to continue with the referral process. The Alogit program used for the model estimation does not automatically normalise nest structures (using the Non-Normalised Nested Logit formulation), as in some cases the analyst may wish to allow the model to have different scales on different alternatives. This was not the case in this model, where we wish to achieve consistency of the utility scale for the utilities on all of the alternatives, so we have manually normalised the nests by applying the scales to all of the alternatives (Daly, 1987). For this reason, Figure 23 shows that the Local Hospital group has the LocalAlt scale applied to it, and the decline referral and not NHS utilities have both scales applied to them.

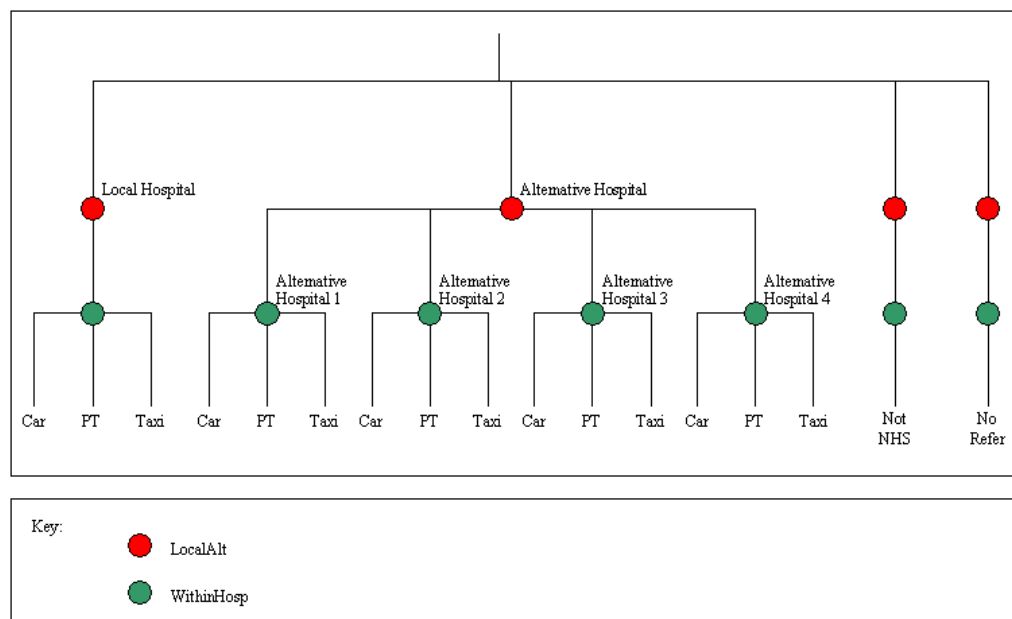


Figure 23: Nested Logit model structure

5.4.2 Testing for interactions

A number of further model tests were undertaken to examine whether the value placed on the domains was influenced by the advice the GP provided. These tests did not reveal any statistically significant interactions. As a result we have no evidence from the experiment to suggest that the respondent considers the domain information differently on the basis of their GP's advice, although the advice can be observed to have a statistically significant impact on the overall choice made.

It is also worth observing that the terms relating to the GP's advice suggest that the value placed on this is asymmetrical, with greater notice being taken of situations where the GP states that a hospital is bad or advises against it.

5.4.3 Dealing with correlations between responses from the same individual

An important advantage of stated preference discrete choice experiments is that several responses can be collected from each individual. This reduces substantially the cost of data collection and allows for more advanced experimental designs. However, the collection of multiple responses means that each respondent's basic preferences apply to the series of

responses that he or she has given: those responses are therefore interdependent. Naïve analysis methods that assume the independence of observations are therefore, in principle, invalid.

While a number of methods can be used to correct for the interdependence of SP observations, experience has shown that a good practical method is to use the “jack-knife” procedure (Bissell and Ferguson, 1975; Miller, 1974). This is a standard statistical method for testing and correcting model misspecifications. RAND Europe has pioneered its use in connection with SP data and has found it to be effective and reliable in this context (Cirillo et al, 1998).

The model results following the jack-knife procedure are presented in the following section. Appendix I provides further details of the theoretical background to the jack-knife procedure and its application in correcting for the interdependence of SP observations.

5.5 Final model of patient choices

For each model, two sets of values are presented:

1. Model summary statistics before the jack-knife procedure is applied;
2. Post-jack-knife coefficient values and their associated t-ratios.

The model summary statistics which are presented are defined in Table 14.

Statistic	Definition
Observations	The number of observations included in the model estimation.
Final log (L)	This indicates the value of the log-likelihood at convergence. The log-likelihood is defined as the sum of the log of the probabilities of the chosen alternatives, and is the function that is maximised in model estimation. The value of log-likelihood for a single model has no obvious meaning. However comparing the log-likelihood of two models with different specifications allows the statistical significance of new model coefficients to be assessed properly.
D.O.F.	Degrees of freedom, i.e. the number of coefficients estimated in this model. Note that if a coefficient is constrained to a fixed value (indicated by (*)) then it is not a degree of freedom.
Rho ² (0)	The rho-squared measure compares the log-likelihood (LL(final)) to the log-likelihood of a model with all coefficients restricted to zero (LL(0)): $Rho^2(0) = 1 - LL(\text{final})/LL(0)$ A higher value indicates a better fitting model.

Table 14: Model Summary Statistics

Table 15 presents these summary statistics for the final SP model before the jack-knife procedure is applied.

Observations	8222
Final Log Likelihood	-13508.1
D.O.F	43
Rho ² (0)	0.339

Table 15: Model summary statistics for the final model

The Rho²(0) value of 0.339 is in line with that which would be expected from a well specified discrete choice model. The model fit is particularly encouraging given the number of respondents; the terms in the model are based on averages of how different groups value certain factors, and this model contains a large number of individual respondents with a distribution of preferences around these averages.

In interpreting the coefficient values the following points should be considered.

- **A positive coefficient** means that the variable level or constant has a positive impact of utility and so reflects a higher probability of choosing the alternatives to which it is applied.
- **A negative coefficient** means that the variable level or constant has a negative impact on utility and so reflects a lower probability of choosing the alternative to which it is applied.
- **Some coefficients are multiplied by continuous variables** and therefore reflect the disutility per unit of the variable, e.g. waiting time over 10 weeks, which reflect the relative disutility per week of wait.
- **Some coefficients are applied to categorical variables;** these therefore reflect the total utility increase or decrease for that variable, relative to a base situation, e.g. the increase in utility as a result of the refunding of travel costs is compared to the base situation of where there is no cost refund.
- **The constants in each model** reflect preferences for the alternatives to which they are applied. For example, the constant for “typically travel by bus” has a positive value of 3.85 and so implies that these patients have a preference for the local hospital alternative.
- **A positive value for a constant** indicates that the respondent is *more likely* to choose that alternative, and a **negative value** indicates that the respondent is *less likely* to choose that alternative.
- **The constants on the models are additive** and more than one constant can be applied to each individual.

Options for declining referral or choosing to be referred to a non NHS hospital were included in the choices presented to the respondents. In order to take account of the cases where respondents chose these options it is necessary to include utility equations for these alternatives. A number of terms have been identified that explain differences in propensity to choose these options, which are reflected as separate constants.

The value shown after each coefficient estimate is the t-ratio. This defines the (statistical) significance of the coefficient estimate; regardless of the sign, the larger the t-ratio, the more significant the estimate. A coefficient with a t-ratio greater than +/-1.960 is estimated to be significantly different from zero at the 95% confidence level. A t-ratio of +/-1.645 is significantly different from zero at the 90% confidence interval. In the model estimation procedure we have used the 95% confidence interval coupled with professional judgement to determine which coefficients to retain in the model. The post-jack-knife coefficients estimates and their t-ratios are presented on the following page.

Variable description		Coeff. Estimate	t-ratio
Travel modes (car, taxi, public transport), time (minutes) and costs (pence)			
Car:	per min of travel for time < 1 hour, household income < £30k + unstated	-0.0332	-8.4
	per min of travel for time > 1 hour, household income < £30k + unstated	-0.0074	-6.0
	per min of travel for time, those with household income > £30k	-0.0117	-6.9
Public transport:	per min of travel for time < 1 hour	-0.0246	-3.7
	per min of travel for time > 1 hour	-0.0060	-6.9
	propensity to choose local hospital for those who typically travel by bus	3.8493	10.5
	constant on public transport compared to car	-1.9334	-6.9
Taxi:	per min of travel for time < 1 hour	-0.1521	-2.4
	per min of travel for time > 1 hour	-0.0103	-2.0
	constant on taxi compared to car	-0.6614	-0.6
Travel costs:	per p of travel costs, if costs currently refunded under transport schemes	-0.0002	-2.5
	per p of travel costs, if patient bears full costs	-0.0001	-3.7
	<i>constant added if patient told travel costs refunded in choice</i>	0.1247	1.3*
Hospital characteristics (performance rating units, 1 to 5) and waiting time (weeks)			
Access and convenience:	per unit increase between 1 and 3	0.4404	4.6
	per unit increase between 3 and 5	0.1803	2.5
Hospital facilities:	per unit increase between 1 and 3	0.7657	5.8
	per unit increase between 3 and 5	0.2526	3.2
Personal experience of care:	per unit increase between 1 and 3	0.8232	7.6
	per unit increase between 3 and 5	0.4802	5.5
Impact on health:	per unit increase between 1 & 5, those with formal education	1.1285	7.4
	per unit increase between 1 & 3, no formal education	1.1129	4.8
	<i>per unit increase between 3 & 5, no formal education</i>	0.3043	1.8*
Waiting time:	per week for waits < 10 weeks	0	n/a
	per week for waits > 10 weeks	-0.0911	-7.5
GP advice			
GP advice:	recommends (relative to no advice)	1.4390	5.0
	advises against (relative to no advice)	-1.9882	-4.3
	rates hospital as 'good' (relative to neutral)	0.7562	3.0
	rates hospital as 'bad' (relative to neutral)	-2.0708	-5.4
	<i>no rating given by GP (relative to neutral)</i>	-0.2676	-1.2*
Patient characteristics			
Propensity to choose private hospital:	men	-2.6020	-2.2
	hold private medical insurance	5.7701	7.0
	all respondents	-1.7774	-2.4
Propensity to choose local NHS hospital:	constant on local hospital (all respondents)	3.9245	4.3
	live in suburbs of a city / large town	0.8864	2.1
	health rated as fair or worse	0.7821	2.0
	visited GP more than 10 times for same prob.	-1.9550	-2.5
	local hospital rated as bad or worse	-1.8044	-3.4
	have internet	-1.3300	-2.2
	anticipate needing a major operation	-1.0550	-2.5
	have no formal education	-0.3353	-3.5
Propensity to decline referral:	all respondents	-2.8696	-3.2
Other constants and structural parameters			
Propensity to choose hospital if:	it is presented in columns 1 or 5 of DCE questionnaire	0	n/a
	<i>it is presented in columns 2, 3 or 4 of DCE questionnaire</i>	-0.1515	-1.5*
Structural parameter LocalAlt (see Figure 23)		0.6755	15.5
Structural parameter WithinHosp (see Figure 23)		0.4189	8.6

Table 16: Final model results after jack-knifing

In this section we consider the implications of our results for the policy issues being considered by the Department of Health as it implements choice at the point of referral. Our initial brief for this project, as outlined in the Introduction, specified five objectives. Below, the implications of our findings for policy are discussed in relation to each of these objectives.

6.1 **Objective 1**

The Department of Health asked us “to construct a robust algorithm to predict the likely level of variation in demand for the services of particular providers on the basis of relevant characteristics of the health care providers on offer, the relevant characteristics of the patients themselves. Such characteristics are likely to include, for patients: age; socio-economic group; morbidity; prior use of hospital services; gender; location including rurality; prior experience and views regarding the providers. For providers, the relevant characteristics will include: travel time (from nearest hospital to three hours) travel costs; waiting time for outpatient diagnosis (from one week to sixteen weeks); waiting time for inpatient treatment (from two weeks to thirty weeks); patient-experience quality (including different ways of presenting this information); clinical quality of hospital (including different ways of presenting this information; e.g. cleanliness as a marker) and clinical quality of surgical team (including different ways of presenting this information).”

6.1.1 **What is the policy issue?**

Understanding the determinants of patients’ choice of provider is crucial for three reasons.

First, the willingness of patients to choose non-local providers with lower waiting times or higher quality will be a key factor behind the success of ‘payment by results’ in increasing providers’ efficiency. Understanding what factors are most important to patients in opting for alternative providers will help the Department of Health to better understand ways to increase providers’ efficiency and quality.

Second, if there are differences between different types of patients in their willingness to choose higher quality, shorter wait providers, this may affect the equity of outcomes from patient choice policies.

Third, understanding how patients respond to specific hospital characteristics will enable the demand for specific hospitals, and patient flows between providers, to be predicted. That is, in the real world, while providers will experience changes in the flows of patients

as a result of choice, such changes do not help in understanding *why* patients have made their choices, and hence indicate what providers can or cannot do in order to respond efficiently to the crude switching signal. This is information both of key interest to individual providers, and also to the Department in planning capacity.

6.1.2 What are the implications of our results?

The principal information to address these policy issues derives from the DCE modelling, but there is also useful information from the rating exercise.

The final model (Table 16) provided the best 'fit' to explain the results obtained from the DCE survey. As Table 16 shows, there are five broad groups of 45 variables which make up the full model. These groups relate to the particular characteristics of the hospitals and patients, the travel modes and costs, the GP advice and a group of constants and structural parameters. It should be noted that patient characteristics (for example, income level) also enters the model under some of the travel modes and costs and hospital characteristics (see final column in Table 16 which indicates the groups to which the variables apply).

Below we examine and interpret the model's findings for each of these variable groups - except GP advice and the general constants in the model which are covered later in this section. We also provide an illustrative example of how the model functions in terms of a simple market.

Travel modes, times and costs

Broadly, and as might be expected, as travel times and costs associated with a particular hospital increase, the propensity for such a hospital to be chosen decreases as the utility patients derive from such a choice decreases. However, as noted earlier, the relationship between the travel time variables for all three modes of transport - car, public transport and taxi - and utility was not linear. The choices made by respondents revealed that an extra minute spent travelling for journeys over 60 minutes produced *less* disutility than an extra minute under 60 minutes. This does not mean that as travel times increase beyond 60 minutes respondents are more willing to choose the alternative and more distant hospital. However, it makes intuitive sense that extra time travelled over 60 minutes produce less disutility per minute given that such additional travel times represent a smaller fraction of the total travel time.

An exception to this, however, was for travel times by car for respondents with incomes over £30,000; for this group the disutility of additional travel time was linear, although given the size of the coefficient, they would appear to suffer less disutility from additional minutes travelled (whether incurred on long or short journeys) than those with incomes under £30,000.

For those respondents who typically travel by bus, there was a relatively strong preference for choosing their local hospital.

Figure 24 provides a comparative summary of the relative impact of travel times by mode of transport. The comparisons are measured in a common currency of waiting times (measured in weeks) and are derived by dividing the DCE model coefficients for travel modes by the waiting time coefficient (and multiplying by 60 to obtain travel time in units of one hour).

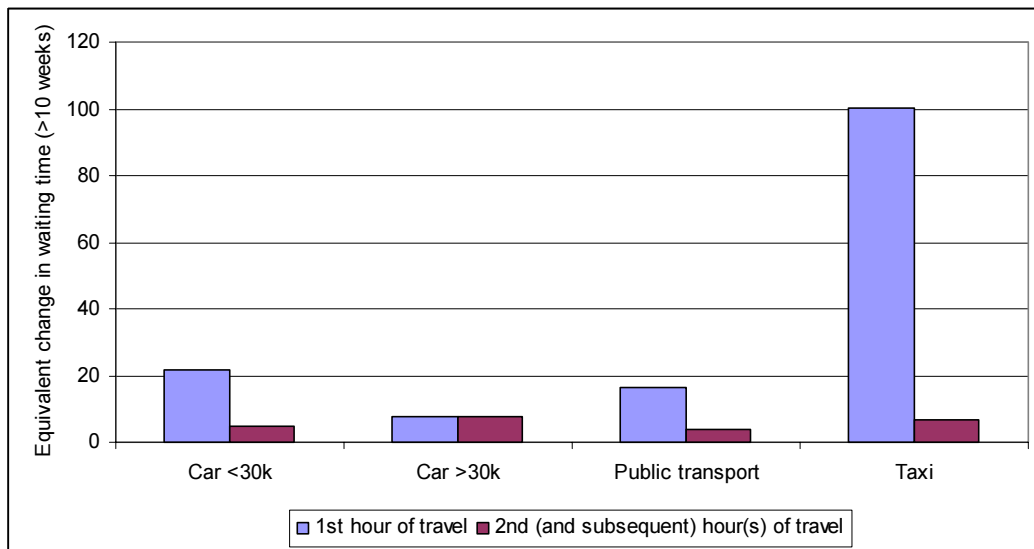


Figure 24: Value of hour of travel in weeks of wait

The figure shows that taxi users are most travel-averse, with an hour of travel having the same impact as if the hospital was local (zero travel time) but had a waiting list some 100 weeks longer, all other things being equal. To put this result in context, it should be noted that it is generated from the responses of individuals who live in areas where there is no public transport available to get to their local hospital. Nearly all of these respondents indicated that they have a car available to them and in the majority of cases; they opt to use the car to travel to their preferred hospital for short journeys. In effect, this aversion to taxi travel times really reflects the small relative likelihood of preferring taxi to car as the mode of transport.

Hospital characteristics

Overall, the propensity for a hospital to be chosen increased with improvements in hospital performance/facilities. Hospitals with better ratings on “access and convenience”, for example, are more likely to be chosen than those with poorer ratings. The fact that people would chose hospitals with shorter waiting times over those with longer waiting times, or hospitals that are generally more ‘responsive’ is not, of course, a major revelation. Of interest here, however are three things: first, the relative importance respondents attach to different aspects of a hospital’s performance and facilities; second, within each aspect of performance, how the propensity to choose alternative hospitals may change given changes in the level of performance; and third, the extent to which the importance or influence of different aspects of performance might vary across different groups.

For all the hospital characteristics (as with the travel mode variables) previous analysis (as set out in section 5.3.1) revealed a non-linear relationship with utility. In particular, improvements on the five point rating from, for example, poor to good were valued more highly and had more influence on the choices respondents made than improvements from good to very good. In particular, for the domains “convenience and efficiency”, “hospital facilities, standards and food” and “personal experience of care”, the valuation for a unit improvement in performance for scores between 1 to 3 (‘1’ being poor performance) was between two and three times higher than the valuation of a unit improvement for scores

above 3. In other words, there is evidence of decreasing marginal rates of utility. There was a more complicated picture of non-linearity for domain D - impact on health. This is discussed below.

For the waiting time variable, there was a particularly stark discontinuity, with waiting times below 10 weeks having no effect on respondents' choices, and with waiting times above 10 weeks having an increasingly negative impact on choice. It should be remembered that in this research respondents to the DCE were told that waiting time represented the time to wait from GP referral to admission to hospital for inpatient care (if required), and *not* the waiting time from referral to the first outpatient attendance. Currently, the full outpatient plus inpatient wait is somewhat longer than 10 weeks - and the 2008 waiting time target of 18 weeks for referral to a bed in hospital will also clearly exceed 10 weeks. However, 18 weeks is a *maximum* target, and it is likely that some hospitals will be able to provide some patients with waiting times at or below 10 weeks. (In fact, in order to meet this maximum wait, median waits will have to be considerably lower - around 8 to 9 weeks) However, the results from this DCE suggest that efforts to reduce waits below 10 weeks will not, on average, be valued by patients (at least in terms of influencing their choice of hospital). Of course, the figure of 10 weeks is an average and will vary from patient to patient and, importantly, may be much lower for clinically urgent cases.

From our examination of the way different respondent groups reacted to the choices presented in the DCE (see section 5.3.5), the only significant difference concerned the influence of the impact on health domain on choices made by those with no formal education compared with those with formal education (that is, GCSE/O level or above). Those with formal education did not exhibit decreasing marginal rates of utility, for the purposes of choosing between hospitals, rating, for example, unit changes at the low end of performance the same as those at the high end. Those with no formal education valued changes above the mid point of performance on impact on health at only a quarter of unit changes below the mid-point. This result echoes a finding from the DCE evaluation of the London Patients Choice Project where the better off were more willing to trade longer waiting times than the less well off if it meant access to a hospital with a 'good reputation' (Burge et, 2005). In this current study, the implication of the difference in valuation on the basis of respondents' educational experience is that, given a choice between hospitals performing in the upper range of performance on impact on health, those with formal education are more influenced in their choice by the relative performance of such hospitals than those with no formal education. In practical terms, this could mean that those with educational qualifications would tend to gravitate to the better performing hospitals more than those without qualifications - with obvious potential impacts on inequalities in health outcome as a result.

As with the travel factors, it is possible to express the relative weight attached to the different hospital performance domains (and by implication the value of the trade off respondents are willing to make) by dividing the hospital domain coefficients by the waiting time coefficient.

Figure 25 shows, for example, that a one unit improvement (from 1 to 2) in “personal experience of care” is equivalent to a reduction in waiting time (above 10 weeks) of around 9 weeks.



Figure 25: Equivalent change in waiting time (above 10 weeks) for a one unit improvement in aspects of hospital quality

The finding that respondents valued unit improvements in hospital quality above the ‘average’ (rating ‘3’) less than similar improvements below average is evident from Figure 25. For example, a unit improvement (from, say, 3 to 4) in personal experience of care is equivalent to a reduction in waiting time of around 5 weeks.

In terms of those factors deemed important by respondents in influencing their choice of hospital, the impact of changes in “impact on health” is most important, followed by “personal experience of care”, “hospital facilities, standards and food” and lastly, “access and convenience”⁶. There are two immediate policy implications of this finding. First, it suggests the need to provide appropriate information for patients to guide their choice of hospital. And second, that some information (for example, on impact of care on a patient’s health) will be more important than other types of information (for example, on aspects of a hospital’s facilities). Figure 26, below, sets out the equivalent change in rating on “access and convenience” for unit changes in the three other hospital quality domains (in a similar way that unit changes were represented as equivalent changes in waiting times in Figure 25 above).

⁶ This more or less accords with the results from the ratings exercise (see figure 6).

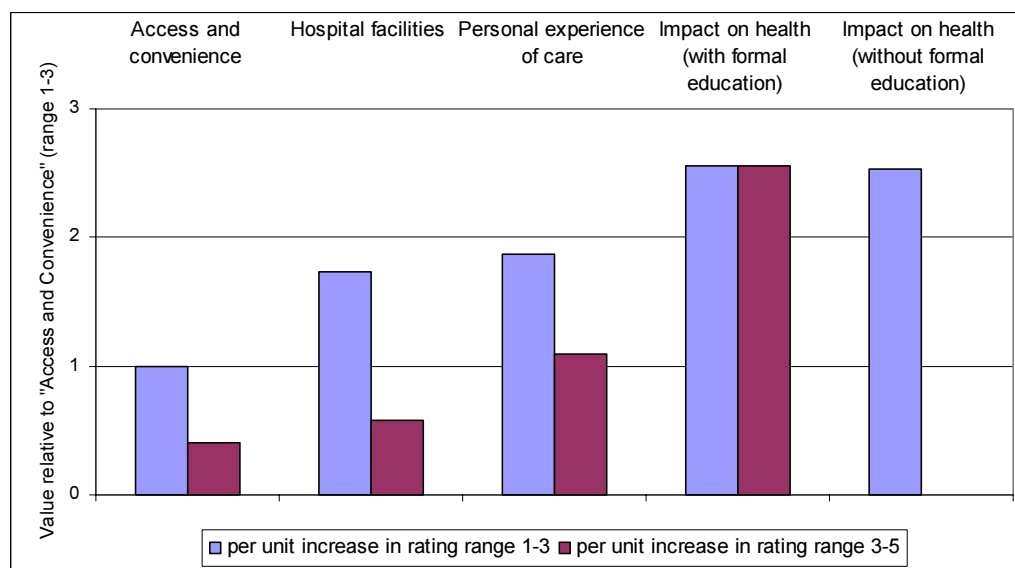


Figure 26: Equivalent changes in access and convenience for a one unit improvement in other aspects of hospital quality

For the most important factor - impact on health - the DCE also tested whether the *level* at which information on this domain was presented affected respondents' choices as this would have significant implication for the provision of information to patients under choice at point of referral. Half the sample for the DCE were told that the performance information on the impact on health domain was "based on the performance across all procedures and all clinical teams within the hospital", and half that it was "based on the performance for the procedure that you were referred for and the clinical team which would treat you within the hospital".

As reported earlier (see Figure 19), no statistical difference was found in respondents' valuations between these two presentational levels, and hence the final DCE model made no distinction between these alternatives. However, as reported in section 4.4, in addition to the rating exercise and the DCE, a specific question was also asked to elicit a direct response on the preference for the level at which information on impact on health would prove most useful. As Figure 14 shows, around 80% of respondents preferred health impact information at the level of the procedure they were to undergo and the clinical team that would treat them.

In relation to the four hospital performance domains A to D, the DCE was limited in being able to present respondents with a general breakdown of the sorts of information these domains represented. However, the parallel rating exercise reported earlier sheds some light on the relative importance respondents placed on a range of indicators which might conceivably contribute to the composite or aggregate five-point 'rating' system used in the DCE. Figure 5 to Figure 13 report on the findings of the rating exercise. However, while it is possible to say that, for example, respondents rated cleanliness as much more important in their choice of hospital compared with the quality of hospital food, we do not have the information provided by the DCE modelling to know to what extent this view would impact on the choices patients may make. Nevertheless, despite the fact that information about food quality was deemed 'very important' by 30% of our sample

compared with 85% who rated information on cleanliness very important, should not be taken to mean that no information on food quality should be provided. Clearly, in relation to information (although perhaps not in terms of modelling demands and patient flows arising from the exercise of choice at the point of referral) meeting the needs of individual patients lies at the heart of current choice policy.

Finally, the positive sign on the constant (ASC_{local}) suggests that, everything else being equal, respondents had a preference for choosing their local hospital over alternatives.

Patient characteristics

The DCE survey collected extensive background information on respondents, which enabled us to carry out exhaustive tests to identify any differences between respondent groups to the choices they made in the DCE. Figure 22 lists the 62 pieces of information collected. This data was used to amend the basic DCE model (detailed above).

In addition to the findings noted above - that the response to car travel time varied according to household income, that those who usually travelled by bus were more likely to choose their local hospital and that respondents' choices based on the hospital characteristic "impact on health" varied according to education - there were a number of other respondent characteristics which were found to be important in modelling the DCE findings.

Surprisingly, we found that respondents' age had no statistically significant bearing on valuations of any of the model's parameters. The elderly, for example, were no more likely to choose their local hospital than any other age group.

Unsurprisingly, we also identified that those respondents with private health insurance were more likely to choose to go to a non-NHS provider. Male respondents were also less likely to consider this option.

The constants in the model based on patient characteristics revealed that those who lived in the suburbs of a large town or city and those who rated their health as fair or worse were more likely to choose their local hospital.

Conversely, there were some groups of respondents that were *less* likely to stay at the local hospital. These groups were those:

- who had visited their GP more than 10 times for the same problem;
- who rated their local hospital as bad or worse;
- who had access to the internet;
- who anticipated they would have needed a major operation;
- without a formal education.

Another way of comparing these 'loyalty'/'disloyalty' effects is to calculate a common currency - in this case, waiting time (in weeks, above the threshold of 10 weeks). Figure 27 presents the equivalent waiting times changes associated with the various patient characteristics noted above. A positive 'equivalent waiting time' indicates that respondents with a specific characteristic will be more likely to switch to an alternative provider, all things remaining equal. This effect is equivalent to the local provider having a longer

waiting time of the size shown. A negative 'equivalent waiting time' indicates that a respondent with the specific characteristic will be less likely to switch from their local provider. This effect is equivalent to the alternative provider having a longer waiting time. Conversely, those in the opposite group are less likely to stay local.

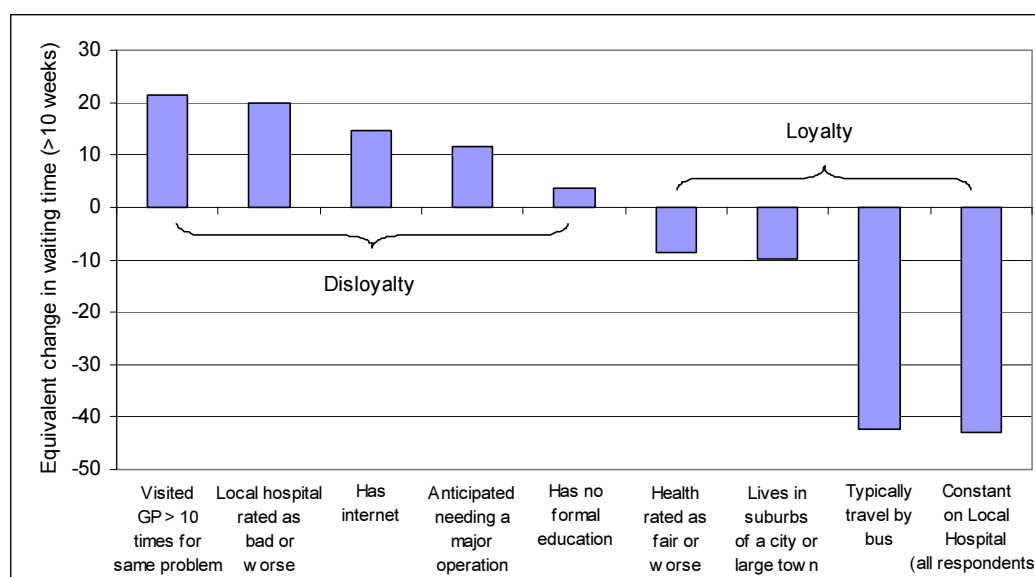


Figure 27: Equivalent waiting times changes associated with the various patient characteristics

It should be noted that the loyalty effects are additive, such that a respondent that had visited their GP more than 10 times previously about the problem for which they were subsequently referred, and who also rated their local hospital as bad or worse and who had access to the internet would be much more likely to choose an alternative provider than someone without those characteristics, all other things being equal.

A social gradient in choice?

The foregoing results provide some insights into the differential valuations respondents with different characteristics place on information used to make a choice of hospital. The implications of these results is that there may be systematic differences in the outcome of choice (ie different groups choose hospitals with different attributes and or levels of attributes), and that, further, this may result in differences in health outcome.

It should be noted that previous testing of respondent characteristics used to build the full DCE model (see 5.3.6) did not find that taking account of respondents' SEG improved the model's fit with the DCE survey data, but that there were some limited income factors (associated with some travel variables). Nevertheless, this does not mean that either SEG or income group are irrelevant as their effects may arise indirectly through other factors identified in the DCE model.

In order to explore this possibility further, those respondent characteristics found to be statistically related to sensitivity to quality (through, for example, loyalty or disloyalty effects) were cross-tabulated with respondents' socio-economic groups and also household income. The presumption is that as the factors found above to be statistically important - internet access, more than 10 visits to GP etc - are likely to be unevenly distributed across SEGs and income classes, then this may point to systematic variations in the choices

patients may make - variations which may then have consequences for (the outcome of) equity of access and consequent knock on effects on health outcomes.

Table 17 and Table 18 show the results for SEGs and household income in terms of the ratio of the observed to expected numbers for each SEG/income class with the particular respondent/patient characteristic, so that, a figure of 110 suggests a 10% higher proportion of that SEG/income class has a particular characteristic than expected (based on the sample as a whole).

Respondent Characteristic	Loyalty effect (extra weeks) ^a	% in sample	Actual / Expected by Socio-Economic Group ^b						
			A	B	C1	C2	D	E	
Visited GP > 10 times	21	9 (n =518)	130	66	99	94	113	146	
Local hospital bad or worse	20	10 (n =1,049)	152	92	99	83	137	73	
Have internet	15	16 (n =1,049)	117	169	139	79	23	0	
Anticipate major op	12	22 (n =1,049)	99	103	100	100	91	108	
No formal qualifications	4	26 (n =1,042)	30	40	62	124	178	197	
Health rated fair or worse	-9	33 (n =1,049)	58	76	87	109	147	118	
Live in suburbs of city/town	-10	27 (n =1,049)	100	126	95	98	98	72	
Typically travel by bus	-42	11 (n =1,048)	18	50	90	121	134	172	
<i>SEGs as proportion of total sample...</i>									
			(n =1,098)	5	19	30	20	15	10
<p><i>a: the impact on the local hospital waiting time (measured in weeks) which is equivalent to the effect on loyalty due to having this characteristic. Note that positive values indicate a higher propensity to switch away from the local provider, while negative values indicate a higher propensity to stay with the local hospital.</i></p> <p><i>b: the ratio of actual numbers with the characteristic to expected numbers based on the percentage of the whole sample with the specific characteristic, by socio-economic group (SEG). Numbers greater than 100 (%) indicate that individuals in this SEG are more likely to have the characteristic than in the total sample and vice versa.</i></p>									

Table 17: The social gradient in choice: Socio-economic group

Respondent Characteristic	Loyalty effect (extra weeks) ^a	% in sample ^b	Actual / Expected by Income Group ^c						
			< £10k	£10k-£19k	£20k-£29k	£30k-£39k	£40k-£49k	£50k+	
Visited GP > 10 times	21	7 (n=383)	91	105	114	40	206	83	
Local hospital bad or worse	20	10 (n=815)	105	107	96	72	73	136	
Have internet	15	19 (n=815)	10	40	121	174	222	238	
Anticipate major op	12	20 (n=815)	96	114	91	95	102	94	
No formal qualifications	4	22 (n=808)	209	131	66	17	26	17	
Health rated fair or worse	-9	31 (n=815)	151	111	83	56	73	73	
Live in suburbs of city/town	-10	26 (n=815)	84	99	112	117	72	107	
Typically travel by bus	-42	10 (n=815)	195	122	72	45	36	12	
<i>Income groups as proportion of total sample...</i>									
			(n=854)	177	241	183	114	56	83
<p><i>a: the impact on the local hospital waiting time (measured in weeks) which is equivalent to the effect on loyalty due to having this characteristic. Note that positive values indicate a higher propensity to switch away from the local provider, while negative values indicate a higher propensity to stay with the local hospital.</i></p> <p><i>b: Note that missing values ("don't know" and "decline to answer") were excluded from the analysis. It is possible that this may introduce a bias if, for example, missing values are correlated with income group.</i></p> <p><i>c: the ratio of actual numbers with the characteristic to expected numbers based on the percentage of the whole sample with the specific characteristic, by Income group. Numbers greater than 100 (%) indicate that individuals in this Income group are more likely to have the characteristic than in the total sample and vice versa.</i></p>									

Table 18: The social gradient in choice: Income group

Figure 28 and Figure 29 below, plot those respondent characteristics which appear to have reasonably consistent gradients. For both SEGs and income groups these were:

- Internet access
- No formal educational qualifications
- Health rated as fair or worse
- Typically travel by bus

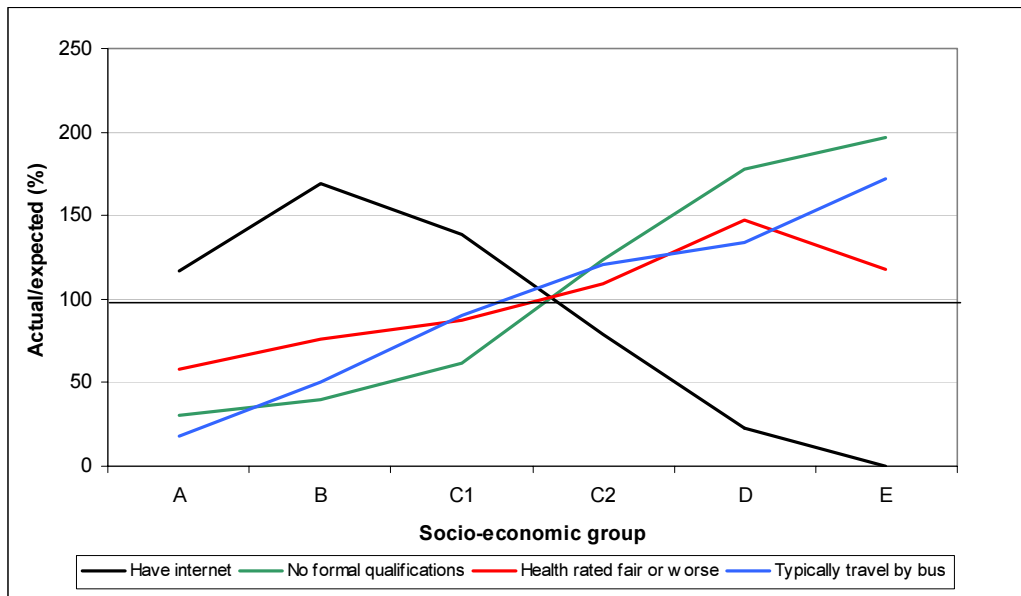


Figure 28: Social gradient in choice: SEGs

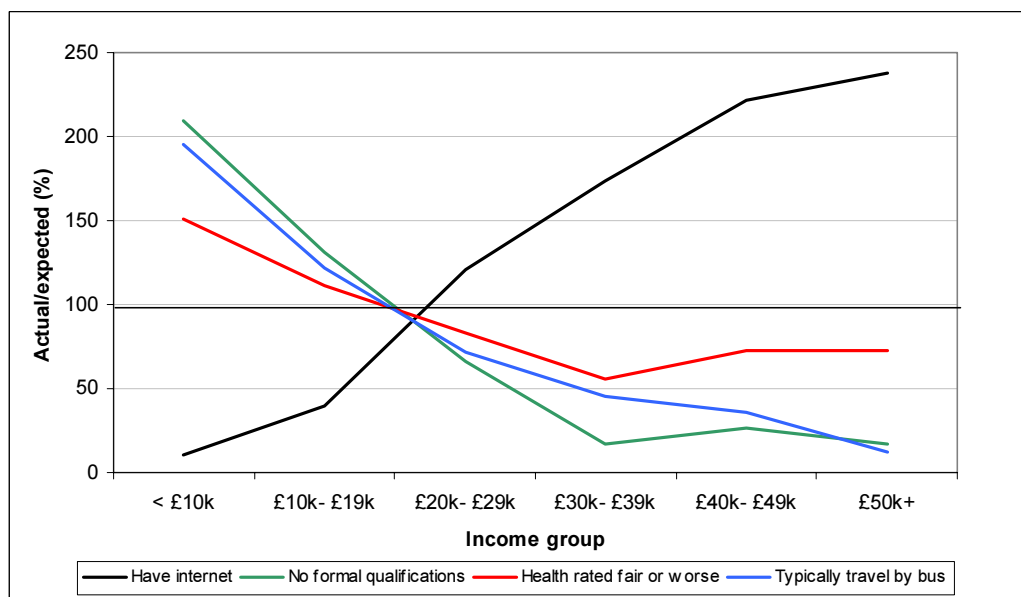


Figure 29: Social gradient in choice: Income groups

A tentative conclusion from the above results is that there does appear to be a social and income group gradient evident from the choices different groups of respondents made in the DCE survey. In particular:

- On the basis of the characteristics: 'typically travel by bus' and 'health rated fair or worse', the propensity to choose the *local hospital* decreases across SEGs from E to A and from low to high income groups;

- On the basis of the characteristics: 'internet access', 'no formal qualifications', the propensity to choose an *alternative hospital* increases across SEGs from E to A and from low to high income groups.

Although 'no formal qualifications' is associated with disloyalty (to the local hospital), this effect is small (equivalent to 4 extra weeks wait at the local hospital) and overall we would expect lower SEGs to be relatively less sensitive to quality. The relatively high prevalence of factors likely to make them loyal to their local provider is compounded by the fact that those with no formal qualifications place no value on improvements in clinical quality above 'average' and SEG E respondents are nearly seven times more likely to have no formal qualifications than those in SEG A.

Forecasting market shares based on patient choices

The foregoing has focussed on particular factors within the DCE model. However, one of the purposes of constructing the model is to capture a complete analysis of the way various factors - hospital performance, patient characteristics etc. - come together and interact to explain the pattern of choices made by respondents. As such, the model can be used as a forecasting/modelling tool to predict, for example, the likely marginal changes in market shares resulting from changes in, for example, the performance of hospitals.

By constructing a base or starting position (see Box 2) and using our sample of respondents, the levels in one or more hospital/patient etc characteristics can be changed and the DCE model run to calculate changes in market share between, for example, the local hospital vs. all alternative hospitals (plus non-NHS providers and 'decline referral').

Box 2: Assumptions used in illustrative model forecasts

- All hospitals rated as 3 out of 5 on all domains
- All hospitals have same waiting time (12 weeks)
- Alternative hospitals are 30 mins further away than the local hospital
- Alternative hospitals travel costs increase pro-rata

We have estimated market share changes - for illustrative purpose - for two situations. The first is a move from a base case where GPs provide no advice about the hospitals on offer to one where they recommend the local hospital. The changes in market share as a result are shown in Figure 30.

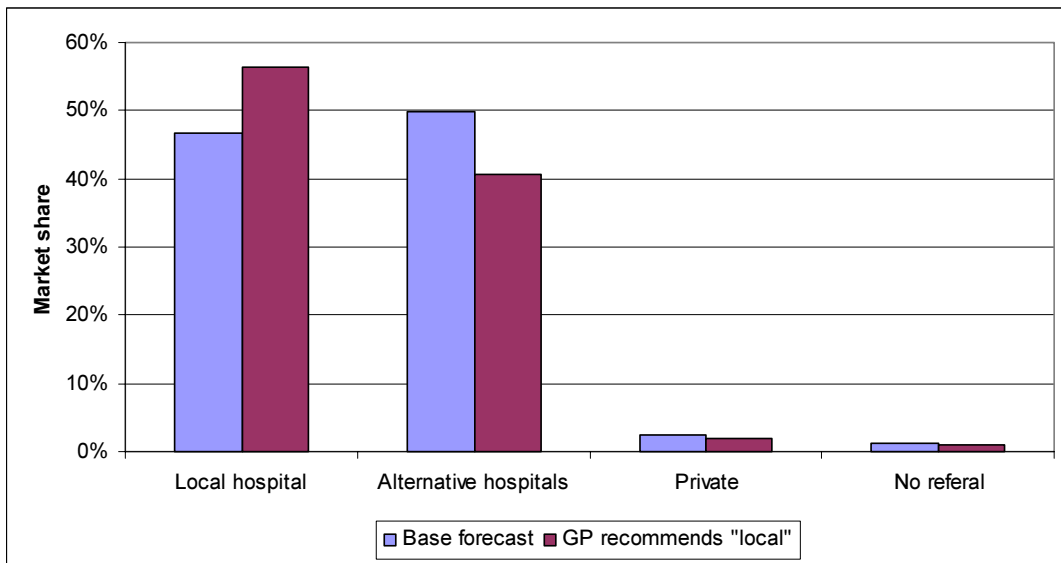


Figure 30: Changes in market share contingent on a change in GP advice to patients.

Figure 30 shows that, not surprisingly, the market share of the local hospital increases at the expense of alternatives, and the non-NHS provider share falls by 20% (from 2.4% to 1.9%) as does the proportion of ‘no referrals’ (from 1.2% to 1%).

The second situation estimates the change in market share of a fall in waiting times at the local hospital from 12 weeks to 8 weeks. The results are shown in Figure 31.

Again, unsurprisingly, the market share of the local hospital increases at the expense of others, with the private share falling again by around 0.4 percentage points and a fall in ‘no referrals’ of around 0.2 percentage points.

Of interest in both these examples is the capacity of the DCE model to not only suggest the general movement in shares (up or down) but the scale of the change. Clearly, application of this sort of forecasting in the real world for, for example, individual trusts or whole health economies, would require considerable work - not least in populating the model with real data (some of which does not currently exist).

It should be noted that these forecasts are provided as an illustration of how the model can be applied, and the resulting market shares are subject to a number of caveats. We would strongly recommend the weighting of the sample to reflect a more representative population, along with the careful consideration and determination of the appropriate starting values (as specified in Box 2).

It is also important to note that these illustrative forecasts are produced from a model that is derived solely from stated preference data. The model would be more robust, and one would have greater confidence in the sensitivity of switching if the model also incorporated data from real world choices situations once this becomes available.

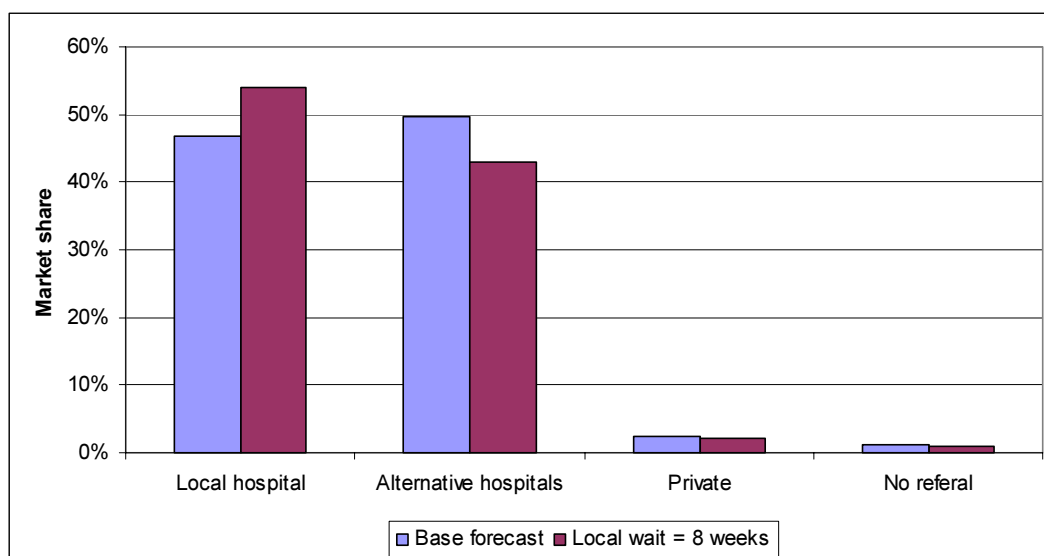


Figure 31: Changes in market share contingent on a reduction in waiting time at the local hospital from 12 to 8 weeks.

6.2 Objective 2

The Department of Health asked us “to gauge the likely response of patients’ decisions to opt for NHS acute care (as opposed to self-care - that is, to decline a referral - or to seek non-NHS care) to a decline in waiting times and the advent of choice with associated quality information”. In particular, the Department wanted “to investigate the sensitivity of demand for NHS services for any particular procedure with respect to: (a) those who would pay for private care from their own pocket but might opt for NHS care if waiting times and quality improved sufficiently (b) those who would be covered by insurance but might cease to pay for insurance cover if NHS care improved sufficiently (c) those who would not bother to seek care but might do so if waiting/quality improved sufficiently.”

6.2.1 What is the policy issue?

As waiting times fall in the NHS and/or other aspects of quality rise, there is a possibility that demand may increase as those currently choosing privately-funded treatment or self-care opt back into the NHS, increasing both demands on the system and costs. These ‘feedback’ effects make it difficult to meet waiting times targets, since demand is in itself a function of waiting times.

6.2.2 What are the implications of our results?

With respect to the effects of reduced waiting times and increased quality in the NHS upon demand for NHS care, it is evident from our DCE results that whether or not an individual has private insurance has a significant impact on their choices at the point of referral. Specifically, this characteristic affects their likelihood of opting for non-NHS care as opposed to any NHS provider (whether local or an alternative hospital), as might intuitively be expected. In order to gauge in more depth the effect of falling NHS waiting times on the demand for NHS treatment of those with private insurance, we examined in more detail the choices made by the 20% of our sample who indicated that they had

private insurance cover. Our hypothesis was that those with private health insurance would have a higher marginal value for short waiting times and other performance indicators than those without private health insurance i.e. that, for this sub-group, the marginal value on shorter waits may not diminish at the same rate as for the overall sample. Results from our initial investigation of this group do not, however, provide support for that hypothesis: statistically, there seems to be very little distinction between the responses to the hospital characteristics and choices made by those who are insured and those who are not insured.

We would emphasise, however, that while the DCE described the five NHS hospitals in terms of these domains, the option of 'seeking an alternative not paid for by the NHS' did *not* describe the private hospital option in those same terms – it was simply an 'opt out' (see the sample choice, Figure 3). Therefore, these results should be regarded as tentative; definitive evidence on the extent to which those with private insurance (or who choose not to be referred at all) might opt for NHS care at sufficiently low NHS waits/high NHS quality would require a separate experiment which described both the private and the NHS options in terms of the relevant characteristics.

6.3 Objective 3

The Department of Health asked us to generate findings which would enable it "to understand the impact that General Practitioners' views about providers are likely to have on patients' choices of hospital".

6.3.1 What is the policy issue?

Given the importance of patient choice to NHS policy, there is a question about whether it is the patients themselves who choose, acting as well-informed, rational consumers, or whether (or to what extent) GPs influence their decision making. In the health economics literature, this is referred to as an imperfect agency problem – consumers (principals) may delegate their decision making to their doctors (in this case, their GPs) as their agents, in response to asymmetric information. If that were the case, the policy emphasis on *patient* choice would, to some extent, be illusory. Further, distortions may arise if GPs make different decisions (due to imperfect information about patients' preferences, or due to financial incentives) to those the patients may have made with the benefit of full information.

Even if imperfect agency was not at issue, there is a pragmatic question about what GPs tell patients about the alternatives they are given, and how patients use their GP's opinions, in conjunction with other sorts of information, in making their choices. Given that choice is being made at the point of referral, and may in some (if not all) cases be made during the GP consultation, understanding the role of the GP is potentially very important in gaining insight into the choices patients make.

6.3.2 What are the implications of our results?

The simple 'ratings' of the importance of information yielded somewhat contradictory results regarding the stated importance of the GP's opinion (see section 4.3.8). In the ratings exercise which preceded our DCE, 60% said GP opinion was extremely important.

However, when asked to indicate which of the various factors was the most important to them, just 2% of our sample indicated that their GP's opinion was the *most* important factor to be considered in making their choice.

While these 'ratings' exercises can be useful, the DCE yields results that are more informative – it allows us to examine the value attributed to specific factors, such as the GP's opinion, by observing how it is traded off against other factors (in this case, 'objective' information on travel time, waiting times, and various other aspects of quality).

A concern we had in undertaking this research was that the GP's opinion might completely determine patients' choices – that regardless of what other information they were presented with, patients would, for the most part, choose the option the GP recommended. The results of the focus groups, pilot, the ratings referred to above and the DCE consistently suggest that this concern was misplaced – patients make their choices considering all types of information, including, but by no means dominated by the GP's opinion. Further, we tested for interactions between the GP advice and participants' response to other attributes and domains; our results suggest no evidence that GP advice influenced the way other (objective) information on hospitals were considered in patients' decision-making. Overall, these results suggest both that, on average⁷, patients are entirely capable of making choices; that GP advice is considered as one, but not the only, relevant source of information on alternatives, and that imperfect agency is not likely to be a fundamental issue.

The DCE results do, however, suggest an important asymmetry in the effect of GP opinion on patients' choices. A GP advising *against* a particular provider carried considerably more weight (i.e. had more influence on choice) than advice in favour of a provider. This was a consistent finding both from the qualitative analysis undertaken from the focus groups, and from the DCE results. The result persists regardless of how the role of the GP is captured in the experiment: whether as the GP providing a rating on *all* the alternatives, or offering a single recommendation in favour of one hospital, or advising against one hospital. In either case, a GP's rating a hospital as 'bad' has a bigger effect than a rating as 'good', and a recommendation against any given hospital has a much bigger effect on the likelihood of that option being chosen than a corresponding recommendation in favour of a given hospital.

Figure 32 shows, when converted into equivalent waiting times (above 10 weeks), the relative impact of GPs' advice/rating and also the asymmetry between recommending for/against and rating 'good'/'bad'. The figure shows, for example, that a recommendation in favour of a hospital is equivalent to that hospital having a waiting time of 15 weeks less than an equivalent hospital similar in all other respects; however, advice against going to a particular hospital is equivalent to a waiting time of around 22 weeks longer than an equivalent hospital.

⁷ This caveat is important; clearly, there will exist patients, GPs and consultations which will not fit this 'average' result.

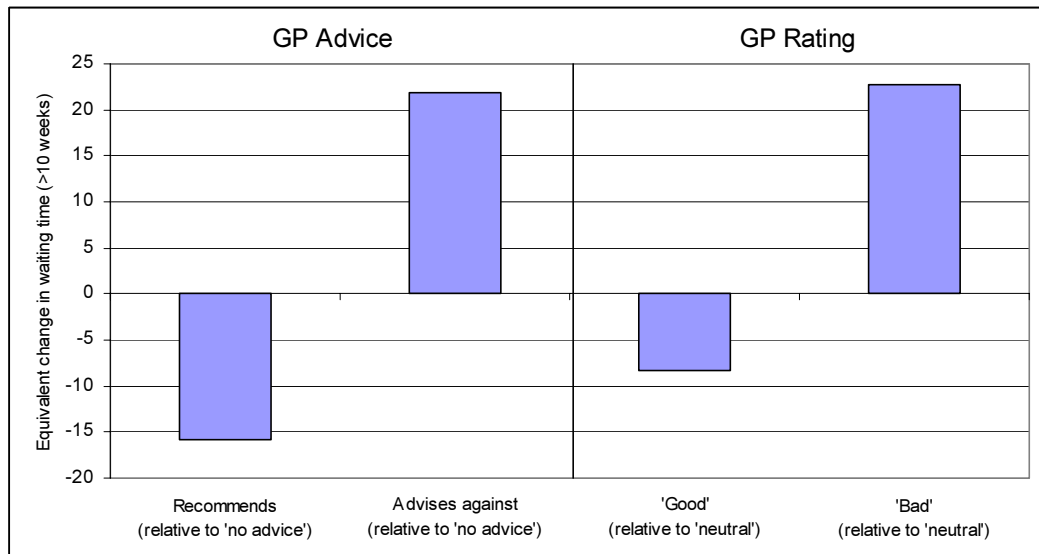


Figure 32: Equivalent waiting times above 10 weeks for GP advice/ratings for hospitals

A related issue which arose in the focus groups was the problem of whether the GPs would have sufficient time within the consultation to talk through the alternatives with the patient, and how this aspect of the consultation might effect the doctor-patient interaction. The Department of Health has commissioned further research on the role of GPs' views on patient choice at the point of referral, which will shed further light on these issues.

6.4 Objective 4

The Department of Health asked us to undertake research so it could "...understand the impact of different ways of presenting information to patients upon their choices whether through use of "star rating" indicators, or more explicitly meaningful information (e.g. mortality rates, etc), and to the source of the information (whether from friends, from newspapers, from the Department, or from GPs)"

6.4.1 What is the policy issue?

This objective relates more to operational than to policy issues. Given that patients are being offered a choice, there is an important set of practical issues about what information they require to make an informed choice, how it should be presented, and how the manner of presentation of that information might affect the choices that are actually made.

6.4.2 What are the implications of our results?

Our results have implications for two aspects of the informational requirements: *what* to present, and *how* to present it.

Some of these conclusions can be drawn from the process of developing the research instrument, particularly the focus group discussions and participant ratings of various hospital characteristics; others come from the DCE modelling, which was designed to test the effect of specific aspects of the presentation and format of information.

The characteristics of hospitals presented in the DCE was influenced partly by the type of information on performance which is in practice available on hospitals, and by our discussions with those involved in the 'Choose and Book' system about what information they hope to make available to patients and how they will present it. Given that the purpose of this research was to model how patients will react to this choice initiative, it was important that our research design reflected, as much as possible, the sort of information that patients will in practice be presented with. The research team had extensive discussions with the Department of Health about the appropriate level of aggregation of the various hospital attributes; given there are limits to how many attributes or domains, and how many levels within each, can be managed within a DCE. The final design of the DCE reflects both consideration of those feasibility issues, and valuable input from the focus groups, which was in turn immediately fed back to those designing the Choose and Book information set.

The ratings reported in section 4.3 indicate that, underlying the aggregate measures of hospital performance represented by the domains in the DCE, there may be different importance (and preferences) placed on the different aspects of each. An implication of this, and a caveat to our findings, is that if participants could 'drill down' into each domain presented in the DCE, their choices may be different. For example, whereas participants in the DCE were making choices on the basis of a 5-level indicator of "access and convenience" any given score on the aggregate domain might comprise different sub-levels of performance on the hospital 'keeping appointments for surgery' (which 65% of respondents rated as extremely important) as opposed to 'ability to provide information in multiple languages' (which just 15% thought to be extremely important). Similarly, within "hospital facilities, standards and food", 85% rated 'cleanliness' as extremely important, but less than 15% rated as extremely important the availability of phones and TVs. Overall aggregate scores on each domain could be constructed from sub-domain scores *weighted* to reflect the relative importance placed on them *on average*; the problem remains that the 5-level indicator on any domain aggregates sub-domains in a manner that does not necessarily reflect *individual* preferences.

Notwithstanding that caveat, our research yields the following insights into how patients use domain information in their decision making.

The focus group revealed two quite different decision processes followed by participants. There were two main methods evident in how participants interacted with the information they were presented with. Around three-quarters of participants focussed on a single factor of most importance to them (most commonly, 'impact on future health' or 'waiting times', and then traded off less important factors against it (a hierarchical approach). Around 20% made their choice by looking at 'all round performance' of each hospital – averaging performance on the levels on each domain. Still others chose their local hospital regardless of its characteristics. Nearly all participants had a 'low quality threshold' they used to rule out some of the options, before proceeding to choose between the others. Results from the DCE modelling, and our experimentation with a variety of nested logit tree structures, suggests that decisions are best modelled as a choice between the local hospital, any of the four alternative hospitals, and non-NHS care i.e. any two alternative hospitals are likely to be viewed as more alike than an alternative hospital compared with the local hospital.

The DCE modelling yielded results on aspects of information presentation and formatting. We tested the effect of presenting information on 'the impact on your health' at the level of the hospital overall, compared with information on the specific clinical team to which the patient would be referred. Information from the ratings suggested, as we expected, that the vast majority preferred information on the clinical team (although, interestingly, nearly a fifth said they preferred information to relate to the whole hospital – a not implausible response, given the possibility of unrelated treatment and transfer between wards being required). Within that domain, nearly all sub-domains (readmission rates, mortality rates, infections and so on) were rated as extremely important by over 70% of participants regardless of whether this information pertained to the hospital or the clinical team.

Results from the DCE modelling gave a somewhat different picture of the effect of the 'level' at which information on clinical quality was provided. Initial modelling tests showed that responses to this domain interacted with the education level of participants (defined as whether or not the participant had GCSEs or higher qualifications). Various means of incorporating these variables were therefore investigated – for example, splitting the responses by whether the information presented by the clinical team and by hospital; and within that, by education level; and combining the responses for clinical team and hospital level clinical performance, and splitting these by education level, etc. Our results suggest that, despite what participants told us about the importance of information on the clinical team, there was no statistically significant difference in the value placed on clinical quality when information is specific to the clinical team, and that when information was instead presented for the hospital overall. However, while those with formal education tended to have linearly increasing value on increases in clinical quality; those without formal education had markedly diminishing valuations of increases in this domain about level 3.

It should, however, be noted that each respondent was only given one definition of clinical quality in the DCE and as such this was their best signal of the performance of the team. It is suggested that further insight could be obtained in future work by presenting both hospital and team scores (at different levels) to each respondent to examine whether they place any incremental value on the hospital score, conditional on having the team score. This is, we would suggest, likely to show that health impact information at the level of the clinical team is the preferred level rather than at the level of the whole hospital.

The DCE was also designed to enable us to detect the influence of the way information on each domain was presented. For example, we varied the order/position of the local hospital and alternative hospital options, so we could determine whether its placement at the far left-hand side affected the probability of it being chosen. There was a small but statistically insignificant effect of option placement; this was controlled for in our modelling.

Finally, an important overall conclusion that might be drawn from this project was that participants could readily handle being presented with quite complex information on a range of quality and other attributes for five hospitals in the DCE, and were able to use this information to make decisions that were internally consistent and reflective of their preferences. For example, 97% of respondents said they understood the characteristics presented in the DCE; 92% indicated that they 'looked at all the characteristics' before

making their choices; and 92% said the options in the questionnaire were like real life. The implication is that patients in real-life referral situations are likely to be able to make informed choices when presented with similar information at the point of referral.

6.5 Objective 5

In undertaking our research, the Department of Health asked us "...To differentiate in this work between different elective surgery procedures as appropriate. It also stated that we were "To investigate the stability of patient preferences across different procedures, taking account of the characteristics of surgical procedures including the following: inpatient vs. daycase; expected length of stay; mortality risk; uncertainty of diagnosis"

6.5.1 What is the policy issue?

Being able to predict demand and patient flows overall requires detailed knowledge of how these might differ between condition or surgery types. Health care is not homogeneous, and there is a possibility that choices may be made in quite different ways for different sorts of conditions and treatments.

6.5.2 What are the implications of our results?

The DCE asked people to make choices about referral, without stating anything about the particular procedure they were to imagine they were being referred for. However, our sample was chosen specifically on the grounds that they had had prior experience with being referred into secondary care, and we sought information, when recruiting participants, about the procedure or condition area that referral was for. We also asked participants to tell us about various aspects of their condition at the time of referral, including the severity of their condition; whether they anticipated needing an operation; whether they expected an overnight stay. We also asked whether that referral did subsequently result in treatment and, if so, whether that treatment was provided as an inpatient, daypatient or outpatient; and, if as an inpatient, how many days stay in hospital were involved.

Using that information, we were able to analyse how these variables influence the choices which were made in the DCE. The assumption is that these prior experiences conditioned the response to choice in this experiment, as it would in real life.

We examined in detail whether the type of condition of operation our sample had experience of influenced their choices – and found no evidence to suggest systematic differences. Of the variables described above, the only variable that was significant in the DCE model was whether the participant had anticipated needing an operation at the time of their referral; this was associated with a lower probability of opting for the local hospital.

It is interesting to consider the implication of that result for understanding patients' choices. Choice at point of referral is a choice of a provider to do two quite different things: to diagnose; and to treat if required. Many patients have to make that choice under uncertainty, not knowing whether they will in fact require treatment or not. The provider they choose to make a diagnosis might be different from the hospital they would choose if they knew with certainty they would require treatment – indeed, that is exactly what the result above suggests. This begs the question of whether the choice patients make at the

point of referral needs to be binding – and whether there is an option of choosing again, if hospital treatment is required (either as an out or inpatient).

This research project has provided considerable insights into the individual choice behaviour that may result from increased patient choice, with particularly important conclusions about the current Choose and Book agenda. However, through the course of this research a number of additional areas have been identified that would benefit from further research, and potential extensions to the current model that could provide additional insights for the Department of Health.

7.1 **Development of a forecasting application**

The demand model that has been developed illustrates the value that people place on different types of information, and how different groups of patients may behave under increased choice at the point of referral. As demonstrated in section 6.1.2, it is possible to apply this model to produce forecasts of the underlying demand for different hospitals under a range of assumptions.

The model could be implemented within an Excel environment to provide the Department of Health, or local trusts, with a user-friendly forecasting tool. Such a tool could be set up to allow the user to define the base situation assumptions and forecasting scenarios which they wished to test, outputting graphs and tables of the predicted demand under each scenario. Such interfaces have previously proved to be useful as they allow a policy maker to obtain illustrative forecasts to compare a range of policy interventions. As well as aggregate level forecasts, it would be possible to present breakdowns to illustrate the likely behaviour of different demographic groups.

It is important to note that the current model is based entirely on stated preference data. Should the department wish to use this model for producing robust forecasts we would strongly recommend collecting revealed preference data now that Choose and Book is being rolled out (see following point).

7.2 **Collection and integration of revealed preference data**

At the time of the data collection and model estimation, relatively few patients had experienced Choose and Book. As a result the modelling effort has had to rely on hypothetical data collected through discrete choice experiments. Whilst this is a valid approach, and is informative, it would be beneficial to collect real-world revealed

preference data on choice behaviour as Choose and Book is rolled out nationally. Such data would complement the stated preference data used within the existing model and would provide further insights into how patients made their choices when faced with real choices between providers.

We would therefore strongly recommend that the opportunity is taken to collect data on the decisions made by patients under Choose and Book, with the recording of information both on the alternatives offered and the choices made. Such data could then be integrated into the same discrete choice framework as the stated preference data and used to estimate an improved choice model. This is particularly important if the model is to be used for forecasting as at present the sensitivity of switching between the local and alternative providers is based solely on hypothetical choice data, and the model would certainly benefit from the incorporation of observations of the choices that patients exercise in real choice scenarios.

7.3 Further examination of social gradient of choice

The analysis undertaken on this data set to date, and reported here, has identified a number of variables that appear to be correlated with both socio-economic group and income. This raises the natural question: what are the compound effects when all these differences are put together? There are two approaches that could be used to further investigate this issue.

The first approach would be to take the existing model and apply it in a forecasting mode, whilst identifying each individual within the sample enumeration procedure by socio-economic group. This approach utilises the fact that there is correlation between the variables of interest within the sample. The outputs from these forecasts could be used to illustrate how the various factors within the model (e.g. access to internet, level of education, rating of health, mode of travel to local hospital) add up to influence the overall likelihood of individuals in different social groups choosing to stay at the local hospital or move to an alternative provider under a range of scenarios.

The second approach would be to revisit the model estimation. Here it would be possible to create composite terms that identify particular groups of respondents of interest within the sample by applying several different characteristics simultaneously. The fit of the model for these groups could then be re-examined, and if appropriate, additional terms could be added to explain particular differences in valuation or choice behaviour observed.

Either of these approaches would provide additional insight into the existence of a social gradient, and could be used to provide a first estimate (from stated preference data) of the likely magnitude of any effect.

7.4 In-depth examination of ratings on impact on health

This project has concentrated primarily on analysing the data collected through the discrete choice experiments. However, as detailed in section 4.3, the survey also collected data on how respondents rated different aspects of each domain. Although it was beyond

the scope of this project, this data may be amenable to further analysis and could provide some interesting insights into the ratings provided by different sub-groups of respondents.

7.5 **Additional analysis of role of GP**

This project has provided an analysis of how the advice given by the GP may influence the decisions that a patient may make, however, there is also a parallel research project that is looking in more depth at the role and attitudes of GPs with regard to patient choice at the point of referral. It may be that the findings emerging from both pieces of research will identify areas of particular interest that would benefit from additional work.

This could range from issues emerging from the King's Fund GP study that could be further explored in the existing discrete choice data, to suggestions of other areas that may be important but would require additional data collection.

7.6 **Modelling of distributed parameters**

The modelling undertaken for this project has focused on estimating the average coefficient values across groups of respondents. These have been estimated with multinomial logit and nested logit models, but this data set also offers the opportunity to use more complex model formulations. Of particular interest may be mixed logit, which could be used to reproduce the substitution patterns within the nested logit model, but can then be extended in two useful ways (Train, 2003).

Firstly the model can be extended to allow the estimation of random coefficients, where the analyst can estimate distributions of model coefficients, illustrating how coefficient value varies across the sample. This could be used to extend the variations in preference beyond those that are currently included in the model, through the inclusion of explanatory variables such as income or level of education, giving insight into the distribution of coefficients within sub-groups.

Secondly, it is possible to take account of the correlation that exists between the choices made by each individual, as it provides an approach to deal with panel data where the decisions made in one situation are dependent upon those from another. This additional parameterisation negates the need to use the jack-knife for correcting the errors in the naïve t-ratios, although it does not address other issues of model mis-specification that can be addressed through the use of a jack-knife or bootstrapping procedure.

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APPENDICES

Appendix A: Recruitment questionnaire

Introduction

Good morning/afternoon/evening. My name is and I am calling from Accent. As you may know, the NHS is giving patients more choice over the hospital they go to and the date and time of their outpatient appointment. We are carrying out a major research study for the Department of Health to investigate the public's attitudes towards this new development, and are surveying people who have been referred to a hospital by their GP within the last 5 years.

Q1. Is there anyone within your household aged 21 or older who has been referred to a consultant at a hospital **by their GP** within the last 5 years?

- 1 Yes, self
- 2 Yes, other family member
- 3 No
- 4 Call back

**CONTINUE
ASK FOR RELEVANT
PERSON AND CONTINUE
THANK & CLOSE
RECORD TIME FOR CALL
BACK**

**IF "CALL BACK" PLEASE RECORD DATE AND TIME OF NEW APPOINTMENT
BELOW, THANK AND CLOSE**

SCREENING APPOINTMENT 1	DATE		TIME	
SCREENING APPOINTMENT 2	DATE		TIME	
SCREENING APPOINTMENT 3	DATE		TIME	

WHEN SPEAKING TO APPROPRIATE CONTACT CONTINUE WITH SCREENING

Screening

Good morning/afternoon/evening. My name is and I am calling from Accent. We are an independent market research company carrying out research with RAND Europe for the Department of Health. The research is looking at the choices you were given at the point when your GP referred you to a consultant at a hospital, to understand what your preferences were and what aspects you would have taken into account if you had been given a choice as to which hospital to be referred to.

This is a genuine research exercise. It is being conducted under the Market Research Society Code of Conduct which means that any answers you give will be treated in confidence. Can you spare five minutes to run through a few questions to check that you are eligible to take part in this research?

Q2. When did your GP last refer you to a consultant at a hospital?

Month _____ Year _____

IF MORE THAN 5 YEARS AGO THANK & CLOSE

Q3. What is the name of your local NHS hospital?

Record:

Q4. Approximately how long would it take you to travel to your local hospital by car?

Record: _____ minutes (If 1 hour or more record in minutes, e.g. 1 hour 10 minutes = 70 minutes)

IMPORTANT TO HAVE A RESPONSE TO THIS QUESTION – IF NOT KNOWN GET BEST GUESS

Q5. Approximately how much would it cost you to travel to your local hospital by car? Please include any parking costs you think you may incur.

Record: £ _____ . _____ pence

IMPORTANT TO HAVE A RESPONSE TO THIS QUESTION – IF NOT KNOWN GET BEST GUESS

Q6. Would it be possible for you to travel to your local hospital by public transport?

- 1 Yes (IN Q7 & Q8 ASK ABOUT PUBLIC TRANSPORT)
- 2 No (IN Q7 & Q8 ASK ABOUT TAXI INSTEAD OF PUBLIC TRANSPORT)

Q7. Approximately how long would it take you to travel to your local hospital by public transport (or taxi)?

Record: _____ minutes (If 1 hour or more record in minutes, e.g. 1 hour 10 minutes = 70 minutes)

IMPORTANT TO HAVE A RESPONSE TO THIS QUESTION – IF NOT KNOWN GET BEST GUESS

Q8. Approximately how much would it cost you to travel to your local hospital by public transport (or taxi)?

Record: £ ____ . _____ pence

IMPORTANT TO HAVE A RESPONSE TO THIS QUESTION – IF NOT KNOWN GET BEST GUESS

Q9. Are you currently entitled to:

- 1. Have you transport to hospital arranged and paid for by the NHS
- 2. Have your transport costs reimbursed
- 3. Neither

Q10. What is the job title of the chief wage earner of your household or, if you are the chief wage earner, your own job title? **IF RETIRED, PROBE WHETHER STATE OR PRIVATE PENSION. IF STATE ONLY CODE AS 'E'. IF PRIVATE ASK WHAT THEIR OCCUPATION WAS PRIOR TO RETIREMENT? PROBE**

What are/were his/her/your qualifications/responsibilities? **PROBE**

WRITE IN AND CODE SEG

- 1. A
- 2. B
- 3. C1
- 4. C2
- 5. DE
- 6. Not stated **THANK &**

CLOSE

Q11. Which of the following age groups do you fall into?

- 1 16-24
- 2 25-29
- 3 30-44
- 4 44-59
- 5 60-64
- 6 65-79
- 7 80 or older
- 8 Refused

Q12. We would like to make sure that we take account of the views of people of all incomes. Could you tell me which of the following income bands your household falls into? Please take account of the income of all those in the household (before tax and national insurance) and include any pensions, benefits or extra earnings.

- | | | | |
|---|-------------------|---|-------------------|
| 1 | Less than £10,000 | 5 | £40,000 - £49,999 |
| 2 | £10,000 - £19,999 | 6 | £50,000 or more |
| 3 | £20,000 - £29,999 | 7 | Don't know |
| 4 | £30,000 - £39,999 | 8 | Decline to answer |

Q13. Interviewer: please record gender.

- 1 Male
- 2 Female

Recruitment

We would like to send you some information about hospital choice and contact you again for an interview about the how you would make choices between which hospital to go to once referred by a GP. The follow-up interview will last approximately 30 minutes and can be conducted at a time most convenient to you.

PERSUADE AND REASSURE. FOR ALL RESPONDENTS, RECORD FULL ADDRESS DETAILS AND SEND SHOW MATERIAL

Q14. Please record how hard it was to recruit the respondent

1. Easy, did not require persuasion to participate
2. Moderate, required slight encouragement
3. Difficult, required considerable encouragement
4. Refused to participate

Thank you for your help in this research

This research was conducted under the terms of the MRS code of conduct and is completely confidential. If you would like to confirm my credentials or those of Accent Marketing & Research please call the MRS free on 0500 396999.

Thank you

I confirm that this interview was conducted under the terms of the MRS code of conduct and is completely confidential

Interviewer's signature:.....

Appendix B: London and Norwich patient choice workshops

During the first part of the workshop (see Figure 33) participants were asked about their own personal experiences of referral to a consultant, highlighting issues that arose for them around the referral process. Participants were then asked to discuss what sort of changes they would like to see made to a referral system, paying particular attention to the information they felt they would require to make an informed choice of where they should be referred.

During the second section of the workshop, participants were asked to work through an example discrete choice experiment, as a way to identify omissions, areas that lacked clarity and presentational problems with the survey form and text introducing the choices. After working on these surveys for around 15 minutes, the group was brought back together and a discussion had about any problems with the surveys and peoples individual methods of decision making within the scenarios presented. The workshops were recorded to ensure that no major issues were missed. Workshop participants were given a financial ‘thank-you’ of £50 per participant at the end of the group meeting.

The way in which the workshops were organised lends itself to a reporting technique that uses tables of findings within specific subsections of the patient choice agenda; these tables of issues raised are presented at the end of this Appendix. In this section, the main findings of the workshop are summarised.

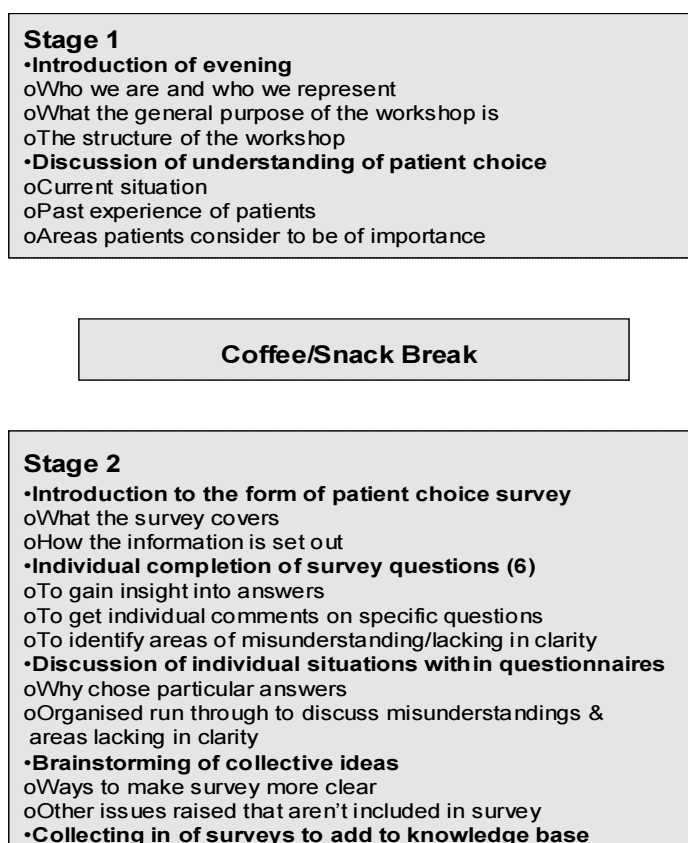


Figure 33: Outline of workshops

Possibly the most interesting result to arise from the workshops was the diversity of views held and the differences in decision making both across and within groups (see below). There were several areas that were consistent throughout, however, both in patients' experiences of the system and also their wishes for the future system. In nearly all cases, participants felt that during the process of their own referral they were not supplied with enough information by their GP. This view included **lack of information** on the timeline of the referral process, which direction their treatment may take, the consultant they were going to see and the hospital in which they would be seen. In discussing what patients would like to know in order to make choices within the new system, several areas arose at all four meetings. Firstly, the **reputation** of the hospital was consistently an important factor; however, so was the reputation of the individual consultant to whom they would be referred⁸. Secondly the **cleanliness and hygiene** levels of the hospital were raised, with a particular emphasis placed on the levels of hospital acquired infections including MRSA. Another issue raised at all the groups was the presence, reliability and availability of diagnostic and rehabilitative **technology** (for example radiology, scanners and physiotherapy equipment), as several participants had experienced problems with this issue. Finally, all the workshops showed that the **transport** to and from a hospital is a

⁸ This result was also found in the USA, when patient choice was investigated by Wind and Spitz. Wind, Y. and Spitz, L.K. (1976) *Analytical Approach to Marketing Decisions in Health-Care Organizations*, Operations Research, **24(5)**, 973-990

major issue. The reasons behind this varied between the London and Norwich participants, with London patients worrying about the costs and reliability of transport, whilst Norwich patients worried more about the distances to travel (in terms of both time and money) and the infrastructure in place for getting to another hospital (such as public transport links).

Urban versus rural differences between the London and Norwich groups were also apparent through the workshops. One example of this was that in Norwich, the notion of “choice” was deemed of secondary importance to an **improvement in standards** of the local hospital. If the local hospital was “good enough” then there was no need to choose another. In London however, choice over hospital was more important than having an acceptable standard for a local hospital, presumably due to the proximity of alternative hospitals. Also, the Norwich groups were much more interested in patient **waiting times** than the London groups. Another difference was that participants in Norwich were interested to know the number of **follow-up appointments** or the nature of follow-up care that would be required, as travelling to further appointments would take longer at an alternative hospital from Norwich than it would do in London (the subject was not brought up specifically in London).

The majority of issues raised within the workshops were not only specific to the workshops, but also specific to individuals within the workshops. In the context of group discussion, there was some level of agreement on several issues within workshops. The **past experience** of using a hospital or consultant would affect people's choice in the future, with good experiences meaning that people would be more likely to re-use a hospital, even for different conditions. For those individuals who were most likely to use their local hospital, the main considerations were **ability of relatives to visit**, the **continuity of treatment** through using the same hospital and the **seriousness of the problem** (with trivial issues being seen at local hospital). Older participants were more likely to choose their local hospital, through loyalty and the desire not to travel.

For people who did not always use the local hospital, a variety of areas would convince them to use a particular alternative hospital. As mentioned above, several of these were consistent across all participants, but others were specific to people. Some people wanted to know the availability of **alternative treatments** (including alternative medicine and non-invasive techniques) at other hospitals, some wanted to know the **private sector influence** on a hospital (how many private beds, percentage of consultant time spent on private cases): The private sector influence was seen as positive by some people (higher quality) and negative by others (a sign of “*money orientated hospitals*”). Another factor that people wanted to use in decision-making was the **facilities** of a given hospital. This included car parking (size, accessibility and cost), public transport links, quality of food, price of additional facilities (such as TV and phones), single-sex wards and private room options, number of nurses per patient, and facilities for parents to stay with children. One factor over which there was disagreement at all the workshops was to do with the **seriousness of a condition**. Some people thought that a particularly serious condition meant that they would go to any lengths to see the best consultant, whereas others suggested that they would be loathe to travel if they were in severe discomfort.

GP opinion was a factor that produced diverse opinions, with people who had particularly strong relationships with their GPs being much more likely to listen to their GPs opinion over referral. Regardless of the relationship with the GP, all participants would listen to advice if the GP told them not to go to a particular hospital, thus patients appear to take more notice of a bad opinion of a hospital by their GP, than a good opinion.⁹ Another factor that most participants agreed upon was the need for more time with the GP if they were to be able to make informed choices; this could also be done with a nurse practitioner. Several people flagged up the relationship with the GP as an area that needed to be worked upon in order to maintain the new system successfully.

Timing during the referral process was discussed by the groups, with many people wanting to see accountability for the process. This could include a timeline for the process whereby you could know where your referral was in the system, a way to move to another consultant if an appointment became available and an easier way to reschedule appointments. It may also include a reliability estimate of the appointment or procedure, to show the level of cancellations by a consultant.

Several **other issues** were brought up by participants during the workshops. These include the **sourcing of data** in order to have maximum transparency and an indication of reliability of the data, and the worry that choice would exacerbate inequalities in access to care. Also people wished to know how choice would work for people with **special needs**, people who are **institutionalised** and people who do not have access to the **internet** to get hold of information.

When people made choices using the survey material, they often ignored their own beliefs (particularly in relation to the GP advice, with people often ignoring it or taking it on board when they considered their GP to be untrustworthy). People used two main methods to make choices:

- A **hierarchy model**, which used a single factor as the most important and then traded off less important factors below it. Often at the top of the hierarchy was “impact on future health”, with “inpatient treatment and care”, “waiting time” and “transport cost” also being important for some.
- An **aggregate model**, where people looked at the all round performance of a hospital (by counting the point scores) and chose the best all-rounder (provided that the most important factors to them – for example “impact on future health” - crossed a quality threshold of 3 points).

Some people did stay loyal to their local hospital throughout, and these people tended to be older participants (this attitude was slightly more prevalent in the Norwich groups).

The **introduction sheet** to the discrete choice examples was another area discussed during the workshops. Within the first two workshops people's understanding of the instructions was poor (problems with specific text, the visual impact of the front-page and with the continuity of details through to the choices). As a result, changes were made to the sheets to try and improve their content and presentation, using the groups to iterate the design.

⁹ This result was also seen during the London Patient Choice Project.

By the third workshop most problems with the front page had been corrected, with the result that the members of the 3rd and 4th groups were very clear in their understanding of what was required of them within the discrete choice examples.

Issues for patients

	Workshop 1 (07.06.05) (London)	Workshop 2 (08.06.05) (London)	Workshop 3 (09.06.05) (Norwich)	Workshop 4 (13.06.05) (Norwich)
Reasons to travel	<ul style="list-style-type: none"> • Reputation of hospital • Specialisation (including throughput of patient type) • GP advice (unlikely to trust other sources of information without knowledge of where data comes from) • Cleanliness of hospital • Decreased waiting time 	<ul style="list-style-type: none"> • Reputation of consultant and/or of hospital • Hospital track record (incl. Patient complaints and infection levels) • GP advice • Waiting time in case of serious illness 	<ul style="list-style-type: none"> • Specialisation of a hospital • If there were money for travel/relatives staying available • Success rates on operations • Cleanliness of hospital (MRSA rates) • GP and friends advice • Research program at hospital • Waiting times 	<ul style="list-style-type: none"> • Good consultant • Serious condition needing specialist help • Reputation of hospital (teaching hospital, research levels) • Large dept for own condition • Hygiene levels of hospital (MRSA rates) • Short waiting time
Reasons to stay at local hospital	<ul style="list-style-type: none"> • No wish to travel if ill • Closeness to family • Past experience of hospital (including comfort of continuity of care) • Problems with travel including accessibility and cost (possibility of shuttle bus service) 	<ul style="list-style-type: none"> • Transport availability is poor • Not a serious problem that requires dealing with • Distance from home 	<ul style="list-style-type: none"> • Travelling is an issue for friends and relatives • Local hospital provides a good service • Knowledge of hospital and patient history • Need to make multiple trips for treatment 	<ul style="list-style-type: none"> • Ease of travel for both patient and relatives • Desire to stay with Local situation • Travel cost too high • If need lots of follow up care
Quality of treatment	<ul style="list-style-type: none"> • Need to address both acute and chronic illness (possibility of alternative medicine as a choice in NHS?) • Drs do not have a broad enough knowledge of different types of medicine • Choice of non-interventionary treatments (for religious or other reasons) 	<ul style="list-style-type: none"> • "Technophobia" (some people would not want very new techniques and technology involved in procedures) • Punctuality and reliability (both of appointment and equipment – i.e. waiting time at hospital) 	<ul style="list-style-type: none"> • GP knows best treatment for a particular person • Knowledge of alternative treatments • Knowledge of departments in hospital (e.g. radiology department) 	<ul style="list-style-type: none"> • Need to know what procedures you might need before consultation • Ability to move across consultants to get seen quicker • No. nurses per patient • Know the timeline of operation, if it will be done when told (% reliability)

	Workshop 1 (07.06.05) (London)	Workshop 2 (08.06.05) (London)	Workshop 3 (09.06.05) (Norwich)	Workshop 4 (13.06.05) (Norwich)
Facilities	<ul style="list-style-type: none"> Refreshments and food quality important (nutritionally) Equipment availability and quality 	<ul style="list-style-type: none"> Separate wards for male/female patients Equipment availability and quality Quality of food Quality of other services (e.g. entertainment, décor, etc...) 	<ul style="list-style-type: none"> Availability of equipment Prices for additional aspects of hospital (e.g. TV, private rooms, etc...) 	<ul style="list-style-type: none"> No. spare beds for emergencies (if need to stay in due to complications) Reliability of equipment Availability of equipment Parking prices, facilities Public transport links
Other	<ul style="list-style-type: none"> Need place to collate info on hospitals that sources its data Identifying ways to present info for choices to different age ranges /cultures/ religions 	<ul style="list-style-type: none"> What is likely to happen to prisoners? 	<ul style="list-style-type: none"> Person who used to live in London used to have more choice but also worried more about each hospital. 	<ul style="list-style-type: none"> Special needs care (e.g. for deaf, blind, etc...) Ability to disseminate information to both patients and relatives

Experience of referral

	Workshop 1 (07.06.05) (London)	Workshop 2 (08.06.05) (London)	Workshop 3 (09.06.05) (Norwich)	Workshop 4 (13.06.05) (Norwich)
Past Experiences	<ul style="list-style-type: none"> Been given wrong information Not given cleanliness info Not enough choice Inappropriate referrals for condition (e.g. only "mainstream" options) Had to wait due to ineffective or unavailable equipment Going with prior knowledge of condition can facilitate dialogue with GP No knowledge of vested interests of GPs (e.g. Drug company kick-backs) 	<ul style="list-style-type: none"> Multiple referrals, not sure who is the correct person to see Waiting time to see a consultant is unknown System is very slow in referring Systems and training in place are not good – possibility of online booking? Lack of communication between GP and consultant over progress of appointment Had to get a 2nd opinion letter in order to be referred Budget constraints may affect referral Some people had very good referral experience (e.g. GP referred them at the time of appointment; GP was helpful and informative) 	<ul style="list-style-type: none"> Very little information about consultant given Process was very organised and timing was quicker than expected Given choice of 2 hospitals and given info about MRSA levels when asked for it Got appropriate referral after discussion with GP over best option Service was good, but no choice Appointment made by phone so had potential to change it (very accommodating about date changes) Asked about alternative treatments and was given information Change of circumstances allowed change of referral speed Was able to liaise directly with hospital over date and location of consultation Little or no input into treatment type Had operation cancelled but when insisted got it rescheduled 	<ul style="list-style-type: none"> Only one person given a choice of where to go (but with no information) Only information given was waiting times Generally most sent to local hospital Had long wait for appointment Were not consulted over time of appointment Time slots for appointments were bad, and when cancelled had long wait again If condition is not serious appointments get moved back Consultations not with the same person on the letter (juniors) Appointments came way after they were meant to from letter Problem with getting GP to spend enough time to refer Going private slashed waiting time Often choice less important than speed

	Workshop 1 (07.06.05) (London)	Workshop 2 (08.06.05) (London)	Workshop 3 (09.06.05) (Norwich)	Workshop 4 (13.06.05) (Norwich)
Future wishes	<ul style="list-style-type: none"> Increasing knowledge and openness of GPs to different treatment methods Dialogue between patient and GP Improved ambience of hospital Patient input into the own therapy (choice in therapy option as well as choice of location) Access to all information about treatment alternatives (incl. Alternative therapies, non-invasive techniques etc...) Tailoring of information for choices to age & culture 	<ul style="list-style-type: none"> "Back of house" set-up in hospitals works with patients to ease bureaucracy burden Markers for progress of referral application Multiple media for getting information about consultants and hospitals (not just the internet) Joint information held on both health service and social services statistics 	<ul style="list-style-type: none"> Way to know how long referral will take Available information on consultants, teams and hospitals Find a way to get peoples personal experiences of hospitals Availability of other GPs or practice nurses for second opinion on hospitals and for longer choice consultations GPs well informed on all hospitals not just local one Improved relationship between GP and patient Way to check hospitals before choosing (either by going or web cams?) Sometimes don't want choice (e.g. if confused, troubled) 	<ul style="list-style-type: none"> Knowledge of consultant reputation (inc personality, skills and quality) Potential plan of future treatment (timeline) Know who you are going to see (if it will be consultant or junior) Which consultant you will see Knowledge of hospital cleanliness Knowledge of number or % of private beds in NHS hospital (as see those with high % as "money grabbing")

Issues with Survey

	Workshop 1 (07.06.05) (London)	Workshop 2 (08.06.05) (London)	Workshop 3 (09.06.05) (Norwich)	Workshop 4 (13.06.05) (Norwich)
Lacking clarity	<ul style="list-style-type: none"> Too many elements contained within each heading (aggregation) Not easy to see the point system (black or white dots important?) Make trade-off clearer in introduction Not enough specific information contained Understand it is about your own situation How the different aspects aggregate to form a rating (weighting) What is "risk management"? 	<ul style="list-style-type: none"> Bullet formatting is misleading (same dots as in survey) Large amount of text on front page. Survey seen as not 'user-friendly' Problems with aggregation of data – too much in each category & weighting of data within each aggregate unclear Relevance of information (e.g. operation success levels may not reflect the procedure you will have) Explanation of rating system on each page Wording: 'referred to a consultant' could be replaced by 'referred for a consultation' 	<ul style="list-style-type: none"> Aggregation data made sense Size of font on front page Use of colour or graphics? Thought "impact on future health" was a strange expression, but no real alternatives offered Possible removal of empty dots to reduce confusion Presence of "recommended" by GP on form confusing – are the blanks don't know or bad? 	<ul style="list-style-type: none"> Introduction good and clear Specific problems with spelling, grammar (QA) Weighting within categories Bracketed items under impact on future health draw the eye and potentially imply more important facts Difference between travel times not large enough to make a difference for rural areas Difference between waiting times is unrealistically short

	Workshop 1 (07.06.05) (London)	Workshop 2 (08.06.05) (London)	Workshop 3 (09.06.05) (Norwich)	Workshop 4 (13.06.05) (Norwich)
Missing items	<ul style="list-style-type: none"> Worked example? How up to date is information Sourcing of data (to show age/reliability) Definite need for consultation during decision making 	<ul style="list-style-type: none"> Level or % of private work performed by consultant (as a measure of quality) Possibility of using a story based worked example that is obviously fabricated to help people understand how to fill out the survey without guiding choices 	<ul style="list-style-type: none"> MRSA as a separate section Breakdown by department for each hospital % of agency nurses in a unit (or staff turnover rates) How close to railway stations 	<ul style="list-style-type: none"> Car park prices included in car travel costs? Facilities for parents to stay with children
Reasons for decision making	<ul style="list-style-type: none"> (Tended to work in pairs) Number of times you need to return for treatment Inpatient/outpatient treatment Hierarchy of decision making (e.g. cleanliness most important followed by quality of surgeon) Some people used aggregate of dots to make decision (use of all-rounder approach) 	<ul style="list-style-type: none"> GP's opinion: if opinion is bad, people will take it more into account; if it is good, it does not influence decision very much. GP's advice: if a hospital is recommended, some people will accept the advice without questioning it, others may have a second look at the NHS info. Elderly people give importance to distance and accessibility: they are less mobile and often do not drive. Younger people with cars may be more willing to travel towards a better hospital You do learn the system as you go – quicker to complete 	<ul style="list-style-type: none"> Costs of getting to another hospital GP opinion (particularly weighted if opinion is negative) Loyalty to local hospital Waiting time Some used hierarchy of factors (with impact on future health generally first, followed by waiting time) Others used aggregation of dots (i.e. good overall hospital) Would often override GPs opinion if particularly high score in impact on future health Impact on relatives for visiting 	<ul style="list-style-type: none"> Some used hierarchy method, with "impact on future health" the 1st issue One person always went to local hospital through loyalty (she was older) Personal relationship with GP affected how much weight was placed on opinion Some used "inpatient treatment and care" as main issue Some took time off work/ away from kids into account Transport is a big issue in rural area as transport links are poor Negative opinion of GP is more important than positive opinion Press influences choices Threshold of 3 dots for allowable quality Some use total no. dots as measure of quality

Appendix C: Final questionnaire

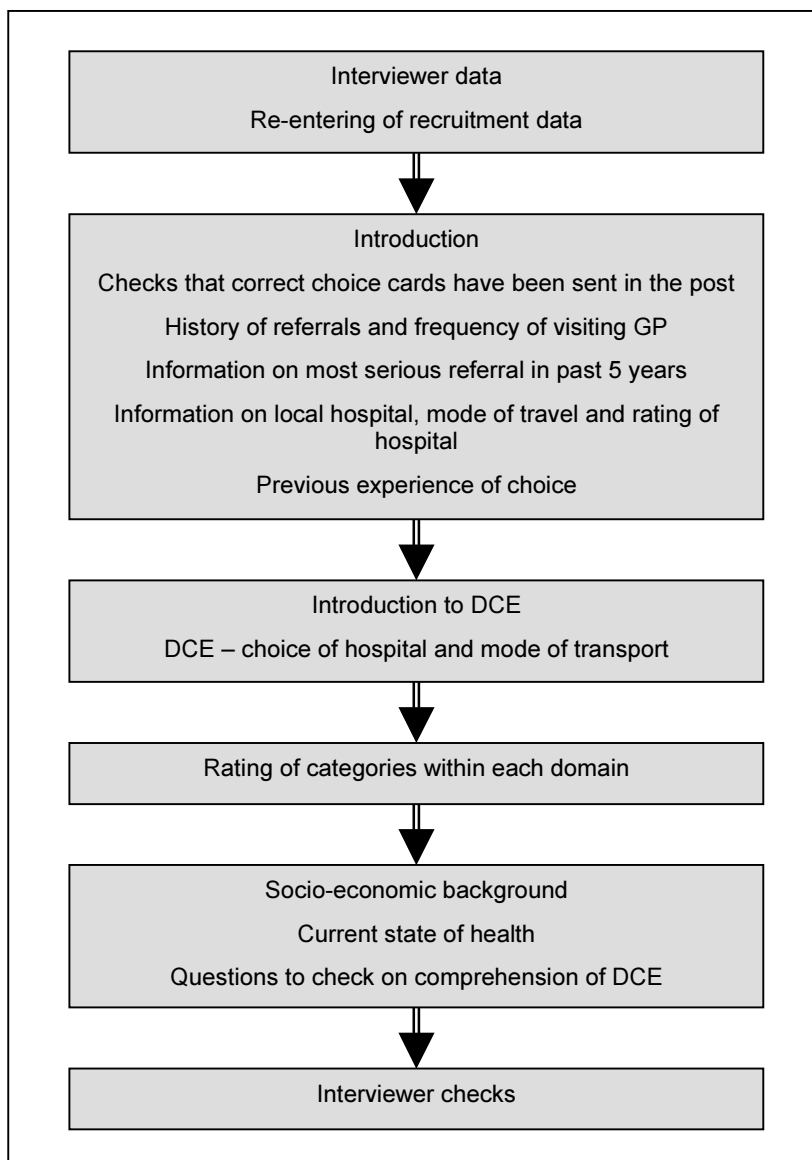


Figure 34: Structure of the questionnaire

Question wording and response codes

STATUS

INTERVIEWER: Is this a real or practice interview?

1. real interview
2. practice interview

VIEWERNO

INTERVIEWER: Please enter your interviewer number

URN

INTERVIEWER: Please enter the URN from the sample

Please note that it is important to enter this correctly for the respondent being interviewed

RESPID

INTERVIEWER: Please enter the respondent SP Card ID number

Please note that it is important to enter this correctly for the respondent being interviewed

RQHOSP

INTERVIEWER: From the RQ sheet please enter the name of the respondent's local hospital

RQCARTIME

INTERVIEWER: From the RQ sheet please enter the time to travel by car to the local hospital (in minutes)

RQCARCOST

INTERVIEWER: From the RQ sheet please enter the cost to travel by car to the local hospital, including parking

RQPTAVAIL

INTERVIEWER: From the RQ sheet please enter whether it was possible for the respondent to reach their local hospital by public transport

1. Yes
2. No

RQPTTIME

INTERVIEWER: From the RQ sheet please enter the time to travel by public transport (or taxi) to the local hospital (in minutes)

RQPTCOST

INTERVIEWER: From the RQ sheet please enter the cost to travel by public transport (or taxi) to the local hospital

RQHOWHARD

INTERVIEWER: From the RQ sheet please enter how hard it was to recruit the respondent

1. Easy, did not require persuasion to participate
2. Moderate, required slight encouragement
3. Difficult, required considerable encouragement
4. Refused to participate

INTRO

Thank you for agreeing to participate in this survey for the Department of Health.

I'd like to remind you that this is a genuine research exercise, which is being conducted under the Market Research Society Code of Conduct. The questionnaire will take approximately 30 minutes. You do not have to answer questions you do not wish to and you can terminate the interview at any point.

INTROAB

Could you look at the material we sent you in the post and find the page which is titled "Which hospital would you choose".

Please can you tell me the letter that is the top right corner, this should be a letter between A and L

1. A
2. B
3. C
4. D
5. E
6. F
7. G
8. H
9. I
10. J
11. K
12. L

CARDSNUM

Could you now look at the pages with the choices between the five hospitals.

Please can you tell me the number that is in the top right corner

CARDSAB

On the same piece of paper, please can you tell me the letter that is below that number in the top right corner, this should be a letter between A and L

1. A
2. B
3. C
4. D
5. E
6. F
7. G
8. H
9. I
10. J
11. K
12. L

TIMESREF

Thank you

You are taking part in this survey because you have been referred to a hospital by your GP at least once in the last five years.

We would like to start by asking you how many times have you been referred to a hospital by your GP in the past 5 years? Please don't count any occasions when you were sent to accident and emergency.

1. 1
2. 2
3. 3
4. 4
5. 5
6. More than 5, please specify:

HOWOFTEN

In general, how often do you visit your GP?

1. Once a month or more
2. Between once a month and once every three months
3. Between once every three months and once every six months
4. Between once every six months and once a year
5. Less than once a year

SAMEGP

Do you tend to see the same GP when you visit the surgery, or does the person you see vary?

1. I see the same GP every time
2. My GP changes from time to time
3. I never see the same GP

WHENREF

From now on, we would like you to think about the referral which you consider to have been your most serious in the past 5 years.

Could we first ask you, when did this referral take place?

1. Within the last month
2. Within the last six months
3. Within the last year
4. Within the last 3 years
5. Within the last 5 years

MOBILITY

How would you rate your mobility at the time of this referral?

1. I had no problems in walking about
2. I had some problems in walking about
3. I was confined to bed

SLFCARE

How would you rate your ability to take care of yourself at the time of this referral?

1. I had no problems taking care of myself
2. I had some problems washing or dressing myself
3. I was unable to wash or dress myself

USUALACT

Were you experiencing problems performing your usual activities (e.g. work, study, housework, family or leisure activities)?

1. I had no problems with performing my usual activities
2. I had some problems with performing my usual activities
3. I was unable to perform my usual activities

PAIN

How would you rate your level of pain/discomfort at the time of the referral?

1. I had no pain or discomfort
2. I had moderate pain or discomfort
3. I had extreme pain or discomfort

ANXIETY

How would you rate your level of anxiety/depression at the time of referral?

1. I was not anxious or depressed
2. I was moderately anxious or depressed
3. I was extremely anxious or depressed

HEALTH

Overall, how would you rate your health at the time of your visit to your GP?

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor
6. Very poor

DRIVE

At the time of this referral, were you able to drive?

1. Yes
2. No

TRAVEL

At the time of referral, were you able to travel long distances?

1. Yes
2. No

PERCEIVE

At the time of referral, did you perceive your illness to be:

1. Not very serious
2. Serious
3. Very serious
4. Potentially life threatening

NEEDOP

When your GP referred you to a specialist at the hospital, did you anticipate that this may have led to an operation?

1. Anticipated major operation
2. Anticipated minor operation
3. Did not anticipate operation
4. Did not know

OVNIGHT

Did you expect that this operation would have required you to stay overnight at the hospital?

1. Yes
2. No

NUMNIGHT

How many nights did you think you may have had to stay in?

1. 1
2. 2-3
3. 4-5
4. 6-7
5. More than a week

MVISITS

Did you expect to have to make more than one visit to the hospital once you had been referred?

1. Yes
2. No

REASON

What was the specific reason for your GP to refer to a specialist?

1. Back or neck problems
2. Allergies
3. Arthritis or rheumatism
4. Difficulty walking
5. Frequent headaches
6. Lung problems
7. Digestive problems
8. Gynaecological problems
9. Anxiety attacks
10. Heart problems or chest pain
11. Other, please specify:

REFPREV

Had you been to your GP for the same problem before?

1. Yes
2. No

TIMES

How many times have you been to your GP for the same problem before?

1. Once
2. 2-5 times
3. 6-10 times
4. More, please specify

LOCLHOSP

When we last spoke to you, you said that #RQHOSP# was your local hospital
We would now like to ask you some questions about this hospital

WASLOCL

Was this hospital the one which you were referred to for your initial consultation?

1. Yes
2. No

LOCTIMES

How often had you been to your local hospital (#RQHOSP#) prior to your last referral?

Please only consider the times you went for reasons of your own personal health.

1. Never
2. Once
3. 2-5 times
4. 6-10 times
5. More than 10 times

LOCOTEN

How often have you been to your local hospital (#RQHOSP#) since?

Again, please only consider the times you went for reasons of your own personal health.

1. Never
2. Once
3. 2-5 times
4. 6-10 times
5. More than 10 times

LOCDIST

How far is your local hospital (#RQHOSP#) from your house?

Less than one mile

1. 1-2 miles
2. 3-5 miles
3. 6-10 miles
4. 11-15 miles
5. 16-20 miles
6. More than 20 miles

LOCTRVL

How would you typically travel to this hospital?

1. Car, drive self
2. Car, lift with other
3. Bus
4. Train
5. Taxi
6. Walk
7. Cycle
8. Patient transport service
9. Other, please specify:

LOCTIME

How long does it take you to travel to this hospital?

Less than 10 minutes

1. 10-14 minutes
2. 15-19 minutes
3. 20-24 minutes
4. 25-29 minutes
5. 30-44 minutes
6. 45-59 minutes
7. 1 hour or more, please specify:

FREEPTS

Are you entitled to free transport under the Patient Transport Scheme (PTS)?

You will only be entitled to this only if your GP has certified that you are medically unfit to travel or otherwise unable to get to the hospital.

1. Yes
2. No

FREEHTCS

Are you entitled to have your travel costs refunded under the Hospital Travel Cost Scheme?

You are entitled to these reimbursement of costs if you receive:

- Income Support
 - Income-based Jobseeker's Allowance
 - Pension Credit, Guarantee Credit
 - Working Tax Credit
 - Disabled Person's Tax Credit
 - Child Tax Credit
 - Or if you have a current entitlement certificate for some other reason
1. Yes
 2. No

LOCCOST

How much does it cost you to get to this hospital?

1. Less than £1.00
2. £1.00-£1.99
3. £2.00-£2.99
4. £3.00-£4.99
5. £5.00-£9.99
6. £10.00-£19.99
7. £20.00-£29.99
8. £30.00-£49.99
9. £50 or more, specify
10. Don't know

LOCOWN

When you have an appointment at the hospital, do you usually go to the hospital on your own?

1. Yes
2. No

LOCWHOM

Whom do you go with?

1. Spouse
2. Relative
3. Friend
4. Other, please specify:

LOCRATE

In general, how would you rate your local hospital?

1. Very good
2. Good
3. Bad
4. Very bad
5. Don't know

OFFCHOIC

Now we would like to ask you some questions about your choice of hospital for first outpatient appointment

Please remember that this is the referral which you consider to have been your most serious in the past 5 years

When your GP referred you for the initial consultation, did you discuss which NHS hospital to go to with your GP?

1. Yes
2. No

HMOFFERD

How many NHS hospitals were you offered to choose between?

1. One
2. Two
3. Three
4. Four
5. Five
6. More, please specify

ADVICE

Did your GP offer you advice on which hospital to choose without you having to ask?

1. Yes
2. No

ASKADVCE

Did you ask your GP for their advice on which hospital to choose?

1. Yes
2. No

GPADVICE

Did your GP provide you with any advice once you had asked?

1. Yes
2. No

CONFADVC

How confident were you with your GP's advice?

1. I trusted their advice
2. Neutral
3. I did not trust their advice

INFLUENCE

Did your GP's advice influence your decision?

1. Yes
2. No

FOLLOW

Did you follow your GP's advice and choose the hospital suggested by them?

1. Yes
2. No

WHICHHOS

Did you choose to be referred to your local hospital, or one of the alternatives offered

1. Local hospital
2. Alternative hospital

NAMEALT

What is the name of the alternative hospital that you chose?

INSURANCE

Do you have health insurance?

1. Yes, personal
2. Yes, corporate
3. No

PRIVCONS

Did you consider seeking private treatment at the time you were referred?

1. Yes
2. No

PRIVGO

Did you decide to go private or stay with the NHS?

1. Go private
2. Stay with NHS

ESTIMATE

When you were referred, did your GP or the hospital provide an estimate of how long you would have to wait for your initial consultation?

1. Yes
2. No

HWLONG

How long was the estimated waiting time?

1. Less than one week
2. 1 week to one month
3. 1-3 months
4. 3-6 months
5. 6 months to one year
6. More than one year, please specify:

STILWAIT

Are you still waiting for your initial consultation?

1. Yes
2. No

HWLONG1

For how long have you been waiting for your initial consultation?

1. Less than one week
2. 1 week to one month
3. 1-3 months
4. 3-6 months
5. 6 months to one year
6. More than one year, please specify:

HWLONG2

How long did you actually have to wait for your initial consultation?

1. Less than one week
2. 1 week to one month
3. 1-3 months
4. 3-6 months
5. 6 months to one year
6. More than one year, please specify:

OPERAT

Did this initial consultation lead to you being admitted to hospital for an operation?

1. Yes
2. No

TREATMNT

Did your initial consultation lead to any other treatment, further diagnosis or therapy?

1. No
2. Yes, scans
3. Yes, Radiotherapy/chemotherapy
4. Yes, Physiotherapy
5. Yes, Laser treatment
6. Yes, other, please specify:

OPTYPE

For what type of operation?

1. Cataract (or other eye operation)
2. Hernia repair
3. Gall bladder (cholecystectomy)
4. Varicose veins
5. Haemorrhoids (piles)
6. Hip replacement
7. Knee operation
8. Nasal surgery (nose)
9. Tonsillectomy
10. Gynaecological operation (e.g. hysterectomy, D & C, sterilisation)
11. Urology operation (e.g. prostatectomy, cystoscopy, vasectomy)
12. Plastic surgery
13. Heart operations (eg. CABG, PTCA)
14. Mastectomy
15. Other, please specify

ESTOP

Did your GP or the hospital provide an estimate of how long you would have to wait for the operation?

1. Yes
2. No

ESTOP1

How long was the estimated waiting time?

1. Less than one week
2. 1 week to one month
3. 1-3 months
4. 3-6 months
5. 6 months to one year
6. More than one year, please specify:

STLWAIT1

Are you still waiting for your operation?

1. Yes
2. No

HWLONG3

For how long have you been waiting for your operation?

1. Less than one week
2. 1 week to one month
3. 1-3 months
4. 3-6 months
5. 6 months to one year
6. More than one year, please specify:

HWLONG4

How long did you actually have to wait for your operation?

1. Less than one week
2. 1 week to one month
3. 1-3 months
4. 3-6 months
5. 6 months to one year
6. More than one year, please specify:

EXPS

We would now like you to look at the material we posted to you. The sheet titled "Which hospital would you choose?" provides an introduction to the choice exercise we would now like you to complete.

We would like you to put yourself in the position of the most serious referral you faced in the last five years, and imagine that at this time you had been offered a choice of which hospital to be referred to. The hospital you choose for your initial referral will also be the one you have any subsequent treatment at.

We will ask you to consider the impact of the location of each hospital, i.e. the travel time and cost to get there.

The travel costs will always be refunded for those who are currently entitled to free transport (under the Hospital Transport Costs Scheme - HTCS), but in some of the scenarios one or more of the hospitals may extend the refund of transport costs to all patients.

You will also have some information that the NHS will provide on each hospital, split down into:

- Convenience and efficiency
- Hospital facilities, standards and food
- Personal experience of care
- Impact on health
- Waiting time from referral to treatment (if required)

You may also be provided with some advice from your GP

EXPS2

In each situation we would like you to tell us which hospital you would chose and how you would travel there.

There may also be cases where you would decide to seek alternative treatment outside of the NHS (i.e. go private) or decline to be referred at that point in time.

These scenarios are imaginary, but we would like you to think about how you would have acted if you had been offered these choices. There are no right or wrong answers to these choices; we are only interested in your views.

CARDSA

Please remember that the rating for the impact on future health is based on the performance across all procedures and all clinical teams within the hospital

CARDSB

Please remember that the rating for the impact on future health is based on the performance for the procedure that you were referred for and the clinical team which would treat you within the hospital

DCECOSTS (only if entitled to free transport)

In all of the choices offered you would still be entitled to free transport to any of the hospitals offered as you would be able to claim a refund under the HTCS scheme

INTREMIND

INTERVIEWER: Please note that the "Local Hospital" is not always the first option.

The position of the "Local Hospital" varies for each respondent, please carefully fill in the responses using the codes provided

(note order of hospitals are randomised)

CHOICE11

Please now turn to the sheet labelled Choice 1. Which hospital would you choose?

1. Local Hospital
2. Hospital 2
3. Hospital 3
4. Hospital 4
5. Hospital 5
6. Treatment outside of NHS
7. Decline referral

TRANSPORT11

and how would you travel to #HOSPTEXT#?

1. Car
2. #PTORTAXI#
3. Other, please specify

CHOICE12

Please now turn to the sheet labelled Choice 2. Which hospital would you choose?

1. Local Hospital
2. Hospital 2
3. Hospital 3
4. Hospital 4
5. Hospital 5
6. Treatment outside of NHS
7. Decline referral

TRANSPORT12

and how would you travel to #HOSPTEXT#?

1. Car
2. #PTORTAXI#
3. Other, please specify

CHOICE13

Please now turn to the sheet labelled Choice 3. Which hospital would you choose?

1. Local Hospital
2. Hospital 2
3. Hospital 3
4. Hospital 4
5. Hospital 5
6. Treatment outside of NHS
7. Decline referral

TRANSPORT13

and how would you travel to #HOSPTEXT#?

1. Car
2. #PTORTAXI#
3. Other, please specify

CHOICE14

Please now turn to the sheet labelled Choice 4. Which hospital would you choose?

1. Local Hospital
2. Hospital 2
3. Hospital 3
4. Hospital 4
5. Hospital 5
6. Treatment outside of NHS
7. Decline referral

TRANSPORT14

and how would you travel to #HOSPTEXT#?

1. Car
2. #PTORTAXI#
3. Other, please specify

CHOICE15

Please now turn to the sheet labelled Choice 5. Which hospital would you choose?

1. Local Hospital
2. Hospital 2
3. Hospital 3
4. Hospital 4
5. Hospital 5
6. Treatment outside of NHS
7. Decline referral

TRANSPORT15

and how would you travel to #HOSPTEXT#?

1. Car
2. #PTORTAXI#
3. Other, please specify

CHOICE16

Please now turn to the sheet labelled Choice 6. Which hospital would you choose?

1. Local Hospital
2. Hospital 2
3. Hospital 3
4. Hospital 4
5. Hospital 5
6. Treatment outside of NHS
7. Decline referral

TRANSPORT16

and how would you travel to #HOSPTEXT#?

1. Car
2. #PTORTAXI#
3. Other, please specify

CHOICE17

Please now turn to the sheet labelled Choice 7. Which hospital would you choose?

1. Local Hospital
2. Hospital 2
3. Hospital 3
4. Hospital 4
5. Hospital 5
6. Treatment outside of NHS
7. Decline referral

TRANSPORT17

and how would you travel to #HOSPTEXT#?

1. Car
2. #PTORTAXI#
3. Other, please specify

CHOICE18

Please now turn to the sheet labelled Choice 8. Which hospital would you choose?

1. Local Hospital
2. Hospital 2
3. Hospital 3
4. Hospital 4
5. Hospital 5
6. Treatment outside of NHS
7. Decline referral

TRANSPORT18

and how would you travel to #HOSPTEXT#?

1. Car
2. #PTORTAXI#
3. Other, please specify

Q 0 RATEINTRO

We would now like you to think in more detail about which aspects would be most important to you if you were asked to choose between hospitals.

Please look at the sheet which we sent you titled "Your Ratings of Factors Influencing Your Choice of Hospital"

We would like to work through each of the items and tell us how you would rate the importance of each of these to you on a scale from 1 to 5, where:

1 is extremely important

and

5 is not particularly important

RTIMECAR

1. How would you rate the time it would take to travel by car

1 is extremely important

and

5 is not particularly important

1. 1
2. 2
3. 3
4. 4
5. 5

RCOSTCAR

2. The amount it would cost to travel by car

1 is extremely important

and

5 is not particularly important

1. 1
2. 2
3. 3
4. 4
5. 5

RTIMEPT

3. The time it would take to travel by public transport

1 is extremely important

and

5 is not particularly important

1. 1
2. 2
3. 3
4. 4
5. 5

RCOSTPT

4. The amount it would cost to travel by public transport

1 is extremely important

and

5 is not particularly important

1. 1
2. 2
3. 3
4. 4
5. 5

RREFUND

5. Whether your transport costs would be refunded
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RCLOSE

6. How close the hospital is to other facilities (bus stops, local shops)
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RTRANSPT

7. How good the hospital is at providing transport for those needing help
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RVISIT

8. How flexible the hospital is about visiting hours and number of visitors
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RLANG

9. Whether the information on transport is provided in multiple languages
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

ROUTPAT

10. How good the hospital is at keeping outpatient appointments
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RSURGE

- 1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RDELAYS

12. Whether patients tend to experience only short delays when at the hospital
- 1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

REXPPLAIN

13. How good the hospital is at explaining how any after-care will be arranged
- 1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RCOMPLAIN

14. How efficiently the hospital deals with any complaints it receives
- 1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RROOMS

15. The standard of rooms provided
- 1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RPRIVACY

16. The amount of privacy you will have
- 1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RCLEAN

17. The general cleanliness of the hospital
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RFOOD

18. The quality of the food provided
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RTVPHONE

19. The provision and cost of using telephones and TVs at beds
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RCHAPEL

20. The availability of chapel or prayer room facilities
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RDISABLD

21. The level of disabled facilities provided
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RINFO

22. The level of information you are provided before admission
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RLANG1

23. The ability to deal with a range of languages
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

ROPATS

24. How well other patients feel their treatment was explained
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RALTERNA

25. Whether patients are offered a range of treatment alternatives
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RINVOLVE

26. Whether the medical staff involve the patients
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RSYSTEM

27. How well the hospital liaises with other parts of the health system
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RRESPONS

28. How responsive the staff are
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RDEPCOOR

29. How coordinated the various departments are
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RREADMIN

30. The likelihood of the operation being successful (readmission rates)
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RDEATH

31. The likelihood of the operation being successful (mortality rates)
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RMRSA

32. Hospital-acquired infection rates (including MRSA)
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RRECOVERY

33. Speed of recovery and rates of side-effects
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

REXPERIC

34. Level of experience of the clinical team
1 is extremely important
and
5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RBPRACTC

35. Whether the staff follow best-practice guidelines
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RNOSTAFF

36. Whether adequate levels of staff are available
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RWAITREF

37. The waiting time from referral to treatment (if required)
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

RGPADVC

38. The advice that your GP may provide
 1 is extremely important
 and
 5 is not particularly important
1. 1
 2. 2
 3. 3
 4. 4
 5. 5

INFOALT

How would you try to find information on the alternative hospital?
 [MULTIPUNCH]

1. Ask GP
2. Look on Internet
3. Directly from hospital
4. Ask Family
5. Ask Friends
6. Ask Colleagues
7. Don't know
8. Other, please specify

IMPACT

Concerning information on the "impact on your health", i.e. the hospital success rates, would you prefer to receive information on the performance across all procedures and all clinical teams within the hospital, or information for the procedure you were referred for and the clinical team which would treat you

1. All procedures and all teams
2. Your procedure and the team that would treat you
3. Don't mind
4. Don't know

GENDER

We would now like to ask you some questions about yourself.

I'd like to remind you that this is a genuine research exercise, which is being conducted under the Market Research Society Code of Conduct, and any information you provide will be treated in confidence.

INTERVIEWER: PLEASE SELECT GENDER

1. Male
2. Female

AGE

Can you tell me your age at your last birthday?

1. 16-24 years
2. 25-29 years
3. 30-44 years
4. 45-59 years
5. 60-64 years
6. 65-79 years
7. 80 years or older
8. Refused

MARRIED

What is your marital status?

1. Married
2. Living together
3. Single
4. Widowed
5. Divorced
6. Separated
7. Refused/Don't know
8. Other, please specify

CHILDREN

How many children under the age of 16 live at your household?

0. Zero
1. 1
2. 2
3. 3
4. 4
5. 5 or more

ADULTS

How many people aged 16 and over live in your household (including yourself)?

1. 1
2. 2
3. 3
4. 4
5. 5 or more

EDUCATION

What is your education level?

1. No formal qualifications
2. GCSE / O level
3. 'A' levels or equivalent
4. Professional qualification below degree level
5. Degree level qualification or equivalent
6. Higher degree
7. Other, please specify:

INCOME

We would like to make sure that we take account of the views of people of all incomes. Could you tell me which of the following income bands your household falls into?

Please take account of the income of all those in the household (before tax and national insurance) and include any pensions, benefits or extra earnings.

1. Less than £10,000
2. £10,000 to £19,999
3. £20,000 to £29,999
4. £30,000 to £39,999
5. £40,000 to £49,999
6. £50,000 or more
7. Don't know

WORK

Are you working, not working or studying at the moment?

1. Working full time (30+ hours a week)
2. Working part time (less than 30 hours a week)
3. Full-time student
4. Part-time student
5. Not working - looking for work
6. Not working - not looking for work
7. Not working - unable for medical reasons
8. Retired
9. Looking after home
10. Other, please specify

OCCUPATN

What is the occupation of the head of household or chief wage earner in your household?

QUALIFIC

What are his/her qualifications or responsibilities?

SEG

INTERVIEWER: CODE RESPONDENTS SEG BASED ON OCCUPATION AND QUALIFICATIONS OR RESPONSIBILITIES OF HEAD OF HOUSEHOLD (PREVIOUS TWO QUESTIONS).

1. A
2. B
3. C1
4. C2
5. D
6. E

DRIVENOW

Are you currently able to drive?

1. Yes
2. No

TRAVLNOW

Are you currently able to travel long distances?

1. Yes
2. No

NUMCARS

How many cars or vans do you or any members of your household normally have available for use? (Include any company car or van if available for private use.)

0. None
1. 1
2. 2
3. 3+
4. Refused/don't know

CARAVAIL

Would you be able to travel to a hospital by car?

1. Yes, drive self
2. Yes, lift with family
3. Yes, lift with friend
4. No
5. Other, please specify:

PTAVAIL

Would there be a viable public transport option for you to travel to a hospital?

1. Yes
2. No
3. Other, please specify:

ETHNIC

To which of these ethnic groups would you say you belong (tick only one)?

White

1. White British
2. White Irish
3. Any other White background, please specify:

Mixed

4. White and Black Caribbean
5. White and Black African
6. White and Asian
7. Any other mixed background, please specify:

Asian or Asian Black

8. Indian
9. Pakistani
10. Bangladeshi
11. Any other Asian background, please specify:

Black or Black British

12. Caribbean
13. African
14. Any other black background, please specify:

Chinese or other ethnic group

15. Chinese
16. Any other ethnic group, please specify:

INTERNET

Do you have access to the Internet?

[MULTIPUNCH]

1. No
2. Yes, via a PC at home
3. Yes, via a PC at work
4. Yes, via interactive TV
5. Yes, via WAP phone
6. Yes, through friends, cyber cafes, etc.
7. Yes, in other ways, please specify

URBRUR

Which of the following describes where you live?

1. A London Borough
2. In another city/large town
3. Suburbs of a city/large town
4. In a rural area, village or small town

POSTCODE

Please could you tell us your postcode?

NOWMOBIL

We would now like to ask you some questions about your health at the moment

How would you rate your mobility at the moment?

1. I have no problems in walking about
2. I have some problems in walking about
3. I am confined to bed

NOWCARE

How would you rate your ability to take care of yourself at the moment?

1. I have no problems taking care of myself
2. I have some problems washing or dressing myself
3. I am unable to wash or dress myself

NOWACT

Are you experiencing problems performing your usual activities (e.g. work, study, housework, family or leisure activities)?

1. I have no problems with performing my usual activities
2. I have some problems with performing my usual activities
3. I am unable to perform my usual activities

NOWPAIN

How would you rate your level of pain/discomfort at the moment?

1. I have no pain or discomfort
2. I have moderate pain or discomfort
3. I have extreme pain or discomfort

NOWANXI

How would you rate your level of anxiety/depression at the moment?

1. I am not anxious or depressed
2. I am moderately anxious or depressed
3. I am extremely anxious or depressed

NOWCHRON

Do you currently suffer from some form of chronic illness?

[MULTIPUNCH]

1. None
2. Back or neck problems
3. Allergies
4. Arthritis or rheumatism
5. Difficulty walking
6. Frequent headaches
7. Lung problems
8. Digestive problems
9. Gynaecological problems
10. Anxiety attacks
11. Heart problems/chest pain
12. Other, please specify:

SMOKE

Do you smoke cigarettes, cigars, or a pipe, at all nowadays?

1. Yes
2. No

NOWHEALT

Overall, how would you rate your health at this time?

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor
6. Very poor

CONCLUSION

That was your final question for the main survey.

We would now like to ask you a couple of questions about this questionnaire.

CHK1A

In the choice scenarios were the hospital alternatives offered realistic to you?

1. Yes
2. No

CHK1B

Which aspects did you consider unrealistic?

[MULTIPUNCH]

INTERVIEWER: IF "OTHER" RESPONSE, PLEASE OBTAIN DETAILS ON NOTEPAD.

1. Travel times too long
2. Travel times too short
3. Travel costs too expensive
4. Travel costs too cheap
5. Waiting times too long
6. Waiting times too short
7. Other (specify in notepad)

CHK2

In these choices, did you understand each of the characteristics describing the hospitals?

1. Yes
2. No

CHK3

What characteristics weren't clear to you?

[MULTIPUNCH]

INTERVIEWER: IF "OTHER" RESPONSE, PLEASE OBTAIN DETAILS ON NOTEPAD.

1. Travel time by car
2. Travel cost by car
3. Travel time by PT
4. Travel cost by PT
5. Refund of travel costs
6. Access and convenience
7. The hospital facilities
8. Patient treatment && care
9. Impact on future health
10. Waiting time
11. GP advice
12. Other (specify in notepad)

CHK4

Did you look at all the characteristics for the hospitals in the choices?

INTERVIEWER: IF "NO" RESPONSE, PLEASE OBTAIN DETAILS ON NOTEPAD.

1. Yes
2. No

CHK5

Which characteristic was the MOST important for you?

1. Travel time by car
2. Travel cost by car
3. Travel time by PT
4. Travel cost by PT
5. Refund of travel costs
6. Access and convenience
7. The hospital facilities
8. Patient treatment && care
9. Impact on future health
10. Waiting time
11. GP advice
12. None

CHK6

Which characteristic was the SECOND MOST important for you?

1. Travel time by car
2. Travel cost by car
3. Travel time by PT
4. Travel cost by PT
5. Refund of travel costs
6. Access and convenience
7. The hospital facilities
8. Patient treatment && care
9. Impact on future health
10. Waiting time
11. GP advice
12. None

CHK7

Did these choices reflect how you might make your decisions if you had to choose between hospitals in real life?

INTERVIEWER: IF NO, PLEASE OBTAIN DETAILS ON NOTEPAD.

1. Yes
2. No

Q 0 BYE

That was the last question.

Thank you very much for your help in this research.

This research was conducted under the terms of the MRS code of conduct and is completely confidential. If you would like to confirm my credentials or those of Accent please call the MRS free on 0500 396999.

STATUS2

INTERVIEWER: Please re-enter whether real or practice interview

1. Real interview
2. Practice interview

MRSCODE

INTERVIEWER: Do you confirm that this interview was conducted under the terms of the Market Research Society Code of Conduct and is completely confidential?

1. Yes
2. No

Appendix D: Conclusions from the pilots of the survey

Conclusions from the first pilot of the survey

The analysis of this pilot concluded that on the whole the surveys worked well and the instrument developed appeared to be collecting the information required to develop discrete choice models to explain the choices that patients may make at the point of referral. The phone-post-phone survey approach also appeared to be working as intended and the reports from the market research agency were positive.

Whilst we had little data available at the pilot stage, the models that were developed were particularly encouraging and many of the variables showed a level of significance beyond that which we would have hoped to achieve.

There were, however, a couple of issues which were identified for further examination.

Around 10% of the respondents in the sample indicated that they felt the travel times for the alternative hospitals were too large. In the piloted design the car travel time could reach a maximum of 4 hours, and in one in five of these cases the public transport time could reach 8 hours. It was decided to keep the maximum travel time by car (i.e. 4 hours). However, the maximum time travel by public transport was reduced to 6 hours.

In real life there are circumstances in which patients may be eligible for free travel to the hospital. During discussions within the project team it became evident that the background questions may not have been identifying all those that were currently entitled to free transport. As a result, two additional questions were added to the questionnaire to identify those that currently are entitled to free arranged travel under the Patient Transport Scheme, and those eligible for having their costs refunded under the Hospital Travel Cost Scheme.

There was also discussion with the team at the Department of Health around how to incorporate the payment and/or arrangement of travel within the discrete choice experiment, as there was a feeling that this was a potential way that hospitals may consider using to provide an incentive to patients to use their services. This was explored and a judgement was made that it was possible to include a variable that specified whether costs were to be reimbursed, but the issue of arrangement of transport would be too complicated to load on to the existing instrument. The addition of a new variable to the discrete choice experiment also had the potential to add unintended complications, and was judged to

require an additional pilot to investigate the impact prior to the main phase of fieldwork (with 1000 respondents).

In the recruitment it also became apparent that some respondents did not have a viable public transport alternative to access their local hospital. For these respondents the interviewer recorded their travel times and costs by taxi as the public transport option. It was decided to formalise this for the main survey and to include taxi as a specific alternative transport mode, and to present this instead of the more generic public transport if during the recruitment questionnaire, the respondent says that he has no access to public transport.

Discussions with the team at the Department of Health also suggested that the headings that were being used for Domain C and Domain D might not have been describing their content accurately enough. In particular, they may not have been conveying clearly the differences between their contents. As a result the domain titles were reworded slightly in consultation with the project team at the DH.

In the pilot we found that about one third of respondents refused to provide information on their income. Since this is a desirable variable for the modelling process, it was decided to reword the question in the survey. The questionnaire was modified so that at the start of the questions on socio-economic background the interviewers would reiterate that any information provided would be treated in confidence. The income question was also reworded to start with the statement that "We would like to make sure that we take account of the views of people of all incomes" and then asks the respondent which income band their household falls into, rather than ask for the income which was then coded into the bands by the interviewer. The number of bands were also reduced and made broader by aggregating some of the previous bands. It was hoped that the cumulative effect of these three changes would increase the response rate to this question.

Modelling of the DCE data from the first pilot of the survey

We found that in our analysis, once all other factors had been accounted for, there was a general preference for the local hospital; this was to be expected. However, we also saw that there was a general tendency when choosing an alternative hospital to choose the leftmost alternative hospital. This suggested that there might have been a confounding issue of respondents preferring the options offered on the left over those offered on the right.

In order to better isolate the impact of the position of the hospital in the choice from the "local" characteristics, it was decided to vary the position of the local hospital in the choices, so that it did not always appear on the left. This change allowed the estimation of constants relating to hospital position as well as the "local" branding. However, such a change required some careful consideration as it would introduce an extra level of complication to the choices offered and had the potential to lead to some respondent confusion. This was minimised by always placing the local hospital in the same position for each individual respondent, but changing this position between respondents.

The suggestion of a vertical ordering effect in the hospital alternative led to a question as to whether there may also be a horizontal ordering effect in the presentation of the variables (i.e. is there greater emphasis on the travel times and costs that currently appear as the first

variables on the choice cards). The LPCP study explored such an issue and discovered that there was no statistically significant difference in the value placed on hospital waiting times between the cases where this was presented as the first or last variable. It was, however, decided that this was an issue that merited further investigation in this current study.

It was therefore decided to move the position of the three blocks of variables on the choice cards. However, in order to avoid confusing the respondents, the variables were kept in the same position for all the cards shown to each respondent. The effect of the variation in the position of the local hospital and the variation in the position of the variables was to generate 30 different layouts of the choice cards. Once further account has been taken of the two different definitions used for Domain D we had a total of 60 different configurations to be tested across the sample of respondents.

Within the pilot model we found a statistically significant coefficient for the situations where the GP “recommended” the hospital, however, we do not have a statistically significant coefficient for the situations where the GP “recommended against” the hospital. This may have been attributable to the limited sample size and insufficient coverage of the factorial design in the pilot, but equally could have been a real effect. It was suggested that the wording might be confusing with “recommend” and “against” working in opposite directions, so it was decided to change “recommend against” to “advise against” as it was felt that this would remove any potential for ambiguity.

Requirements for a second pilot

It was agreed that in addition to the minor amendments that we would expect after a pilot, there were two significant changes that were made to the discrete choice experiments:

1. Addition of new variable on refunding of travel costs
2. Re-ordering of variables (and local hospital) which generate 30 different layouts

Concern was expressed by the research team that these changes should be piloted before committing to undertake 1000 interviews, as there existed the potential for these changes to have unanticipated impacts. Following discussions with the team at the Department of Health it was agreed that a second pilot of 100 respondents should be undertaken to ensure that the changes made do not have unintended impacts.

Conclusions from the second pilot of the survey

In general, the second pilot also worked very well. The models being produced were still strong and we did not have any evidence that the changes had led to any ambiguity in the interpretation of the choice exercise.

We examined the sample obtained for this second pilot, comparing it to both the initial recruitment sample and the DCE sample obtained in the first pilot. Both of these comparisons returned promising results. We observed that there is no evidence of any response bias being introduced between the recruitment stage and the participation in the DCE survey. We have also obtained a sample for this second pilot that was broadly similar to the first pilot.

The minor changes made to some of the background questions appeared to have produced the desired effect. It is particularly worth noting that we achieved less non-response for the

income question. The other changes made did not introduce new problems, and as a result we had a number of additional useful variables that could be used in the later analysis.

In general, the changes made to the discrete choice experiment seemed to have addressed some of the areas of concern from the first pilot, and were producing results that were more in line with expectations. The changes to the wording of the domain titles resulted in the impact on the respondent's health being valued higher than their personal experience of care.

We have also introduced a new variable that covers the refunding of travel costs, but at this stage it did not appear not to be a significant influence on the choice of hospital.

With regard to the concern over the potential for positioning effects, we tested a wide range of different card configurations. These changes did not appear to have introduced any unanticipated consequences and we had no evidence to suggest that the cards were less clear to respondents as a result of the changes.

With respect to the positioning of the hospitals, at this pilot stage we had a model in which the related constants were not statistically different from zero, indicating that the position of the alternative did not appear to have an influence on the likelihood of it being chosen. Moreover, the actual values of the constants did not suggest any tendency for a preference towards the hospitals located to the left.

With respect to the positioning of the variable groups, at this stage we had no evidence to suggest that the position of the variable in the information tool had a systematic impact on the valuation of the attributes. However, because of the small sample size, no definitive conclusions could be made on the basis of the pilot data alone.

The feedback from respondents suggested that overall, respondents tend to understand the questionnaire and seemed to have no particular issues with the characteristics used to describe the hospitals. We observed that almost 30% of respondents stated that they felt that the scenarios presented were not realistic, but judging from the responses this may be because they did not believe there was scope for them to be offered alternative hospitals at the distances that the travel times suggest (either because the alternatives were too close or too far away). However, all the respondents seemed to be able to respond to the choices.

To conclude, the changes that were introduced appeared to have been successful. We were still able to estimate a strong model and the pilot produced no evidence that these changes impacted on the respondents' ability to undertake the exercises. There was no evidence to suggest that there were any positioning effects, but this was an issue for further testing following the main survey once more data became available to support the analysis.

Appendix E: Experimental design

The discrete choice experiment required a design which included a large number of variables, many of which were specified with five levels.

Alternative	Variable	Number of levels
Common to all	Advice type	4
	Advise for which (if applicable)	4
	Advise against which (if applicable)	4
Local Hospital	Car time	1 (fixed)
	Car cost	1 (fixed)
	PT/Taxi time	1 (fixed)
	PT/Taxi cost	1 (fixed)
	Domain A	5
	Domain B	5
	Domain C	5
	Domain D	5
	Domain E	5
	Advice (if rated)	4
	Travel refunds	4
Alternative 1	Car time	5
	Car cost	5
	PT/Taxi time	5
	PT/Taxi cost	5
	Domain A	5
	Domain B	5
	Domain C	5
	Domain D	5
	Domain E	5
	Advice (if rated)	4
	Travel refunds	4
Alternative 2	Car time	5
	Car cost	5
	PT/Taxi time	5
	PT/Taxi cost	5
	Domain A	5
	Domain B	5
	Domain C	5
	Domain D	5
	Domain E	5
	Advice (if rated)	4
	Travel refunds	4
Alternative 3	Car time	5
	Car cost	5
	PT/Taxi time	5

	PT/Taxi cost	5
	Domain A	5
	Domain B	5
	Domain C	5
	Domain D	5
	Domain E	5
	Advice (if rated)	4
	Travel refunds	4
Alternative 4	Car time	5
	Car cost	5
	PT/Taxi time	5
	PT/Taxi cost	5
	Domain A	5
	Domain B	5
	Domain C	5
	Domain D	5
	Domain E	5
	Advice (if rated)	4
	Travel refunds	4

Table 19: Summary of variables in experimental design

In order to generate such a large design a “mix and match” strategy (Louviere, 1998; Chrzan and Orme, 2000) was employed, which is set out below.

The design was developed from a large fractional factorial plan that allowed the examination of the main effects of up to twenty-nine variables with eight levels each. This design comprises of 512 separate treatments. From this design, fourteen columns were selected to cover the requirements for an individual hospital alternative and the common variables, and the variables within the plan were collapsed from eight levels to either five of four levels as appropriate.

Alternative	Variable	Number of levels
Common to all	Advice type	4
	Advice for which (if applicable)	4
	Advice against which (if applicable)	4
Individual Hospital	Car time	5
	Car cost	5
	PT/Taxi time	5
	PT/Taxi cost	5
	Domain A	5
	Domain B	5
	Domain C	5
	Domain D	5
	Domain E	5
	Advice (if rated)	4
	Travel refunds	4

Table 20: Variables in base fractional factorial plan

The base plan with these fourteen variables was then used to generate the plans for the five hospitals by creating a series of “foldovers”, in which the variable levels were rotated to increase the resolution and balance across the design. This use of foldovers in defining the plans for the different alternatives in the choice set also allows the estimation of interaction effects.

Variable	Base	Foldover 1	Foldover 2	Foldover 3	Foldover 4
Advice type	Common	n/a	n/a	n/a	n/a
Advise for which (if applicable)	Common	n/a	n/a	n/a	n/a
Advise against which (if applicable)	Common	n/a	n/a	n/a	n/a
Car time	n/a	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
Car cost	n/a	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
PT/Taxi time	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
PT/Taxi cost	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
Domain A	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
Domain B	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
Domain C	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
Domain D	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
Domain E	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
Advice (if rated)	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4
Travel refunds	Local Hosp	Alt Hosp 1	Alt Hosp 2	Alt Hosp 3	Alt Hosp 4

Table 21: Use of foldovers to create reference plans for all alternatives

The five plans (base and four foldovers) for the alternatives (local and four alternative hospitals) each contained 512 treatments. The treatments from the plans were assigned to choice sets by randomly drawing five sequences of random numbers between 1 and 512 without replacement. These sequences were then used to determine which treatment to use for each alternative in 512 separate choice situations.

The 512 choice situations were then blocked into 64 choice sets of 8 choice situations. Each recruited respondent was incrementally assigned one of the 64 choice sets for their discrete choice exercise.

In addition, thirty card layout configurations were tested. These did not alter the information presented within the choice situations, but rather varied the order in which the information was presented. The horizontal ordering (i.e. position of the local hospital) had five different permutations, and the vertical ordering (i.e. the position of the three variable blocks) had six different permutations.

Finally, the meaning of Domain D “Impact on Health”, was varied, so for half the respondents the description was “based on the performance across all procedures and all clinical teams within the hospital” and for the other half was “based on the performance for the procedure that you were referred for and the clinical team which would treat you within the hospital”.

Clearly with a sample of 1,000 respondents it is not possible to obtain complete coverage of all {choice set, layout configuration, domain D description} permutations. In fact, in designing the study, the initial intention was to obtain appropriate coverage of the choice sets and domain descriptions. As such, we did not set out to cover all possible permutations with the choice layout, but rather considered this an additional extra that could be explored and used as a mechanism to isolate potential biases.

Appendix F: Example choice card introduction

Which hospital would you choose?

A

INTRODUCTION

We would like you to think about when your GP referred you to a consultant at the hospital. Please imagine that at this time you had been offered a choice between five different hospitals to go to for your appointment. We will present you with a series of possible scenarios. These scenarios are imaginary, but we would like you to think about how you would have acted if you had been offered these choices. There are no right or wrong answers to these choices; we are only interested in your views.

INFORMATION PROVIDED

Each of the hospitals will be described in a number of ways:

Location

You will be shown the travel time and cost to get to the hospital by both car and public transport. If you are currently entitled to have your transport costs for hospital visits refunded (under the HTCS) then this will continue to be provided free of charge. In some of the scenarios, one or more of the hospitals may extend the refund of transport costs to all patients.

Information provided by the NHS

This is the information that the NHS will provide rating the service provided by each of the hospitals. The ratings are based on a scale of 1 to 5, where:

- ○ ○ ○ ○ is well below average
- ○ ○ ○ ○ is below average
- ● ○ ○ ○ is average
- ● ● ○ ○ is above average
- ● ● ● ○ is well above average

This information is split into five different categories:

A. Convenience and efficiency – this rating covers:

- how close the hospital is to other facilities (bus stops, local shops)
- how good the hospital is at providing transport for those needing help
- how flexible the hospital is about visiting hours and number of visitors
- whether the information on transport is provided in multiple languages
- how good the hospital is at keeping outpatient appointments
- how good the hospital is at keeping appointments for surgery
- whether patients tend to experience only short delays when at the hospital
- how good the hospital is at explaining how any after-care will be arranged
- how efficiently the hospital deals with any complaints received

B. Hospital facilities, standards and food – this rating covers:

- the standard of rooms provided
- the amount of privacy you will have
- the general cleanliness of the hospital
- the quality of the food provided
- the provision and cost of using telephones and TVs at beds
- the availability of chapel or prayer room facilities (continues in next box)

- the level of disabled facilities provided

C. Personal experience of care – this rating covers:

- the level of information you are provided before admission
- the ability to deal with a range of languages
- how well other patients feel their treatment was explained
- whether patients are offered a range of treatment alternatives
- whether the medical staff involve the patients
- how well the hospital liaises with other parts of the health system
- how responsive the staff are
- how coordinated the various departments are

D. Impact on health

Based on the performance across all procedures and all clinical teams within the hospital

- this rating covers:
 - the likelihood of the operation being successful (readmission rates)
 - the likelihood of the operation being successful (mortality rates)
 - hospital-acquired infection rates (including MRSA)
 - speed of recovery and rates of side-effects
 - level of experience of the clinical team
 - whether the staff follow best-practice guidelines
 - whether adequate levels of staff are available

E. The waiting time from referral to treatment (if required)

- presented as a number of weeks

GP opinion of hospital

You will be told whether your GP provides any advice, and if so what they think of the options available to you.

INSTRUCTIONS

In all these choices please think about the referral which you consider to have been your most serious in the past 5 years. In each case please indicate which option you would have chosen if these options had been available to you when your GP last referred you. We are aware that the options may be different to those you would like to be offered, and you may have to trade some things off against others, but we would like to know what you would have chosen if these had been your options. In some situations your local hospital may have improved some aspects of the service it offers, but in others this may have deteriorated.

Please select which of the hospitals you would have chosen and how you would have travelled to that hospital in the situations presented. If you would not have chosen any of the hospitals offered, you may either say you would have chosen to seek alternative treatment outside of the NHS, or decided to decline referral at that point in time. **You should only tick ONE of the twelve boxes offered in each scenario.**

Appendix G: Detailed feedback on the discrete choice exercise

Table 22 shows the responses to the question “In the choice scenarios were the hospital alternatives offered realistic to you?” Eighty percent of respondents said that the offered alternatives were realistic.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	798	79.6	79.8	79.8
	No	202	20.2	20.2	100.0
	Total	1000	99.8	100.0	
Missing	-1.00	2	.2		
Total		1002	100.0		

Table 22: Responses to the question: “In the choice scenarios were the hospital alternatives offered realistic to you? (CHK1)”

As in the analysis of the two pilots, the predominant reason stated for the alternatives offered being unrealistic was that the travel times were unrealistic, although this was balanced between those who felt that the alternative hospitals would typically be closer and those who felt that the alternative hospitals could not be so close as they lived in remote areas. Some respondents said that the waiting times were unrealistically long. Two individuals indicated the lack of information about parking. One respondent said that the differences between the GP’s opinion and the information provided by the NHS were too different. Another respondent said that the travel costs were too high.

Table 23 shows the responses to the question “In these choices, did you understand each of the characteristics describing the hospitals?” Ninety seven percent of respondents said that they understood all the characteristics describing the alternatives.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	971	96.9	97.1	97.1
	No	29	2.9	2.9	100.0
	Total	1000	99.8	100.0	
Missing	-1.00	2	.2		
Total		1002	100.0		

Table 23: Responses to the question "In these choices, did you understand each of the characteristics describing the hospitals? (CHK2)"

Those respondents who answered "no" to the previous question were asked which characteristics were not clear to them.

- One respondent said the GP advice was not clear, going on to state that the "GP knows best"
- One respondent found domain 2 (The hospital facilities) unclear
- One respondent stated that the dot system of rating hospitals was not clear to them
- One respondent said both the car and public transport times and costs were unclear
- One respondent said that they did not understand the question

These results show that there is not one variable that is consistently misunderstood by respondents, and on the whole the majority of the respondents could understand the exercise. It is particularly encouraging to note that none of the respondents stated that they encountered a problem with the new variable that presents the refunds for travel costs.

Table 24 shows the answers to the question "Did you look at all the characteristics for the hospitals in the choices?" 95.4% of respondents answered "yes".

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	956	95.4	95.6	95.6
	No	44	4.4	4.4	100.0
	Total	1000	99.8	100.0	
Missing	-1.00	2	.2		
Total		1002	100.0		

Table 24: Responses to the question "Did you look at all the characteristics for the hospitals in the choices? (CHK4)"

Table 25 shows which was the most important hospital characteristic for the respondents. 32.7% of all respondents said that the impact on their future health was the most important characteristic. For 22.3% the most important was patient treatment and care.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Travel time by car	94	9.4	9.4	9.4
	Travel cost by car	8	.8	.8	10.2
	Travel time by PT	11	1.1	1.1	11.3
	Refund of travel costs	1	.1	.1	11.4
	Access and convenience	86	8.6	8.6	20.0
	The hospital facilities	95	9.5	9.5	29.5
	Patient treatment && care	223	22.3	22.3	51.8
	Impact on future health	328	32.7	32.8	84.6
	Waiting time	122	12.2	12.2	96.8
	GP advice	20	2.0	2.0	98.8
	None	12	1.2	1.2	100.0
	Total	1000	99.8	100.0	
Missing	-1.00	2	.2		
Total		1002	100.0		

Table 25: Responses to the question “Which characteristic was the MOST important for you? (CHK5)”

Table 26 shows which was the second most important characteristic. 20.8% of respondents said patient treatment and care, while 19.2% said the hospital facilities.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Travel time by car	63	6.3	6.4	6.4
	Travel cost by car	21	2.1	2.1	8.6
	Travel time by PT	10	1.0	1.0	9.6
	Travel cost by PT	9	.9	.9	10.5
	Refund of travel costs	2	.2	.2	10.7
	Access and convenience	86	8.6	8.8	19.5
	The hospital facilities	192	19.2	19.6	39.1
	Patient treatment && care	208	20.8	21.2	60.3
	Impact on future health	166	16.6	16.9	77.2
	Waiting time	158	15.8	16.1	93.4
	GP advice	33	3.3	3.4	96.7
	None	32	3.2	3.3	100.0
	Total	980	97.8	100.0	
Missing	-1.00	22	2.2		
Total		1002	100.0		

Table 26: Responses to the question: “Which characteristic was the SECOND MOST important for you? (CHK6)”

It is notable that only 0.2% of the respondents felt that the refunding of travel costs was either the most important characteristic or the second most important characteristic. This is in agreement with the model, where the coefficient for this variable is insignificant.

Table 27 shows the responses to the question: "Did these choices reflect how you might make your decisions if you had to choose between hospitals in real life?" 92.1% of respondents answered "yes".

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	923	92.1	92.3	92.3
	No	77	7.7	7.7	100.0
	Total	1000	99.8	100.0	
Missing	-1.00	2	.2		
Total		1002	100.0		

Table 27: Responses to the question: "Did these choices reflect how you might make your decisions if you had to choose between hospitals in real life? (CHK7)"

In conclusion, the respondents tended to understand the questionnaire and seem to have no particular issues with the characteristics used to describe the hospitals. Around 20% of respondents stated that they felt that the scenarios presented were not realistic. Judging from the responses, this may be because they did not believe there was scope for them to be offered alternative hospitals at the distances that the travel times suggest (either because the alternatives were too close or too far away), however, nearly all the respondents seemed to be able to respond to the choices.

Appendix H: Modelling checks on ordering effects

Checks on impact of horizontal position of local hospital

Within the discrete choice model a series of constants were defined to reflect the position of the alternative within the choice set. Table 28 shows the five different horizontal orderings of the hospitals that were tested and how the constants were applied to reflect the horizontal position of the alternative. It should be noted that an additional constant was applied to the utility of the local hospital, wherever it was positioned, to reflect the additional value placed on it being identified as the “local” alternative. As a result the constants *Column1*, *Column2*, *Column3* and *Column4* were estimated relative to *Column5* to investigate whether the four leftmost positions were more or less likely to be chosen than the hospital located on the far left of the choice set.

Horizontal Position	1	2	3	4	5
Order 1	Local	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Order 2	Alternative 1	Local	Alternative 2	Alternative 3	Alternative 4
Order 3	Alternative 1	Alternative 2	Local	Alternative 3	Alternative 4
Order 4	Alternative 1	Alternative 2	Alternative 3	Local	Alternative 4
Order 5	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Local
Constant Applied	<i>Column1</i>	<i>Column2</i>	<i>Column3</i>	<i>Column4</i>	<i>Column5=0</i>

Table 28: Constants used to test impact of horizontal position of hospital

The estimated coefficients show that the position of the hospital actually has relatively little impact on the likelihood of the hospital being chosen. The results suggest the the coefficient on *Column1* is not significantly different from zero, i.e. the hospital on the far left is just as likely to be chosen as the one on the far right. The other three coefficients are not statistically different from each other, and only verge on being statistically different from zero. Therefore, the model has been developed with the coefficients on *Column1* and *Column5* constrained to zero, and the coefficients on *Column2*, *Column3* and *Column4* constrained to take the same values. The results suggest that the middle three hospitals may be slightly less likely to be chosen than those in the far left and far right positions.

Checks on impact of vertical position of variables

A further model was tested to examine the impact of the position of the groups of variables. Table 29 shows the six different orders that were tested for the three blocks of variables.

Vertical Position	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
1 (<i>high</i>)	Travel costs & times	Travel costs & times	Ratings and waiting times	Ratings and waiting times	GP advice	GP advice
2 (<i>mid</i>)	Ratings and waiting times	GP advice	Travel costs & times	GP advice	Travel costs & times	Ratings and waiting times
3 (<i>low</i>)	GP advice	Ratings and waiting times	GP advice	Travel costs & times	Ratings and waiting times	Travel costs & times

Table 29: Vertical positioning of groups of variables

In order to test the impact of the position a model was estimated where each variable was represented by three different terms, one for when it was in the “*high*” position, one for when it was in the “*mid*” position and one for when it was in the “*low*” position.

The coefficients for travel time (either by car, PT or taxi) showed signs of becoming more negative as they move down the page. On the other hand, the coefficients on travel costs and their refund showed no particular patterns.

The four information domains showed no patterns. The value placed on waiting time became both more negative and significant as it moved down the page.

As far as the GP's opinion is concerned, it generally showed no pattern. However, the coefficient relating to the situation when the GP gave a “bad” rating of a given hospital showed signs of becoming more negative and significant as it moved down.

In conclusion, although there are some cases where the position of the variable appeared to have an impact, once the confidence intervals of the estimates were taken into account we saw no statistically significant effects confirming increasing (or decreasing) valuation.

In the cases where there is a suggestion of an ordering effect, respondents give more importance to the information appearing at the bottom of the page. In particular, travel time, waiting time and a negative opinion of the hospital on the part of the GP tend to be more important when they are located at the bottom of the page.

The strength of the design used in this study is that because we have data relating to all possible positions of both variables and alternatives we can both detect any differences and control for them. In fact, by combining the data from all of these permutations we can estimate a model that provides the mean value irrespective of where the variable is positioned, i.e. the estimate of no one variable is systematically biased as a result of its position in the choice card.

Appendix I: The jack-knife procedure

The jack-knife is a parametric approach to estimate the “true” standard errors of estimates in cases where the theory does not provide an exact estimate of the error. It is possible to explicitly model this correlation between observations using panel analysis techniques, and in the case of logit choice models a mixed logit formulation; however, this would necessitate the transfer of the model to a different modelling package where we may find disadvantages in other aspects of the modelling, e.g. dealing with the large number of alternatives, etc. For the purposes of this project, we have therefore employed the jack-knife technique to provide an improved estimate of the standard errors over those provided by the naive estimation that assumes independence between observations.

The jack-knife works by dividing the sample into R non-overlapping random sub-samples of roughly the same size, where R should be at least 10, and in the case of these runs a value of 20 has been used. The procedure is set up such that all observations from a given individual fall in the same sub-sample. One model is then estimated on the full sample and then R additional models are estimated each excluding one of the sub-samples in turn. Each estimation is therefore performed on approximately $(R-1)/R$ of the observations.

For a given variable, suppose that we get estimate β_0 from the full sample, and an estimate β_r for each of the sub-samples $r = 1$ to R .

The jack-knife estimate of β is then:

$$\hat{\beta} = R * \beta_0 - (R-1)/R * \sum_{r=1,R} \beta_r$$

The variance of that estimate is:

$$\sigma^2(\hat{\beta}) = (R-1)/R * \{ (\sum_{r=1,R} \beta_r^2) - (\sum_{r=1,R} \beta_r)^2 / R \}$$

In general, the application of the jack-knife procedure to SP data has confirmed that the coefficient estimates themselves are not greatly affected by the specification error of assuming independent observations. However, the significance of the coefficient estimates is often substantially overstated by the naïve estimation. Thus, when there is an important issue about the significance of a specific variable, it is necessary to test that variable in a jack-knife procedure rather than in a naïve estimation. Generally it is found that when variables are significant at very high levels in a naïve estimation, they remain significant in the jack-knife estimation; but when the significance of a variable in the naïve estimation is marginal, a jack-knife estimation may show that it is not truly significant.