The relative importance attached to access, equity and cost-effectiveness by people and organisations providing health services

Report for the National Co-ordinating Centre for NHS Service Delivery and Organisation R & D (NCCSDO)

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prepared by

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Executive Summary

Introduction

The NHS seeks to promote access to services, reduce inequalities in health, and use its resources in the most cost-effective ways. Against the background of an ever-increasing demand on resources, there may be occasions when these objectives come into conflict with one another. Health service providers would therefore like to know something about the relative importance that is given access, equity and cost-effectiveness.

However, currently no real guidance is given on how to balance the competing objectives. This study aimed to fill some of the gaps in our knowledge in this regard. In line with the SDO call, the focus of the study was on the prevention and treatment of coronary events.

Aims of the project

This project had four main aims:

1. Provide clear working definitions of cost-effectiveness, equity and access.
2. Show how decision-makers think cost-effectiveness, equity and access should be traded off against one another.
3. Identify the implicit trade-offs between these concepts from real-world decisions.
4. Provide a framework for the NHS to make explicit trade-offs when there is conflict between the objectives of cost-effectiveness, equity and access.

To provide definitions of the concepts, a review was undertaken of the ways in which cost-effectiveness, equity and access have been used in the academic literature and in key policy documents. In addition, 14 decision-makers at the macro (national), meso (regional) and micro (individual patient) levels were interviewed in order to find out what they understood by the terms.

The results from the literature and from qualitative analysis of the interview transcripts show that:
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1. Cost-effectiveness has a reasonably clear meaning but it is sometimes difficult to incorporate into practice for both operational and political reasons.

2. Equity and access are not easily captured in simple terms, and there is often overlap between how the terms are used. Given that one of the main ways in which the NHS tries to achieve a more equitable distribution of health outcomes is through the promotion of greater access to services, it is not surprising that these concepts become confused.

It was possible, however, to construct working definitions of the concepts from the qualitative interviews for use in later stages of the project:

- Cost-effectiveness was defined as the maximisation of health benefits
- Equity was defined in terms of reducing inequities in health.
- Access was defined in two ways: a) in terms of the distance that people have to travel to utilise services (geographical access); and b) how long they have to wait to use those services (temporal access).

Data collection

To show how decision-makers think cost-effectiveness, equity and access should be traded off against one another, a number of primary data collection studies were carried out:

1. A replication study, which asked hospital specialists (excluding vascular, cardiac or respiratory medicine) to answer the same questions as had previously been put to members of the UK general population. Respondents choose between programmes that maximised benefits (expressed in terms of life years gained) or targeted benefits on those with lower life expectancies (the lowest social class and men). They were additionally asked to choose how a committee charged with making resource allocations should be comprised.

2. A discrete choice experiment (DCE) in which specialists in vascular, cardiac or respiratory medicine were asked to make a series of choices between two scenarios, each of which different according to different levels of cost-effectiveness, equity, geographical access and temporal access.

3. Follow-up interviews designed to help explain responses to the DCE study.
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4. A pairwise comparison (PC) study in which respondents to the DCE study compared scenarios that contained only two concepts at a time; in other words, this was a ‘stripped down’ version of the DCE. The questionnaires were posted out to respondents and the interviews were conducted on the telephone. Some of the variants of these questionnaires also contained questions about respondents’ attitudes towards the NHS and how it sets priorities.

Results

The results were as follows:

**The replication study**

Six hundred and seventy five completed questionnaires (38% response rate). NHS staff are less willing to target resources to those with lower life expectancy at birth (the lowest social class and men) than a UK general population sample. The majority (53%) chose not to target, which compares to a minority (42%) of the general public. The NHS staff sample and the general public sample agree on having a GP and a hospital doctor, but the NHS staff are less enthusiastic about the inclusion of a patient representative.

**The DCE study**

Three hundred and eighty completed questionnaires (26% response rate). Two-fifths of respondents gave responses that suggested that they favoured one attribute to the exclusion of all others i.e. they did not trade-off across concepts. Most of these were in relation to health benefit (cost-effectiveness). Fewer respondents who completed the attitudinal questions employed such a strategy although this difference does not reach statistical significance. The results for the whole sample suggest trade-offs between the concepts. In order to have the same effect as reducing inequalities in health, a programme increasing total health benefit would have to provide 2.41 on top of an original benefit of 30 QALYs. In order to have the same effect as a one month reduction in wait, the total health benefit of the programme would have to increase by 1.47 QALYs. A one QALY improvement in total health benefits has the same effect as a reduction of 5.84 miles in the average distance to a hospital (across a population of around 60,000 people).

**The follow-up interviews**

The results from 14 respondents suggest that some of the findings in the DCE may be explained by extraneous factors (e.g. temporal access was beyond their control, understanding
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of QALYs was not straightforward) but that, on the whole, respondents were engaged in the task. The results were generally consistent with the quantitative results of the DCE survey.

The PC study

171 completed questionnaires from a sample of respondents to the DCE study (49% response rate). Those who exhibited dominant preferences first time around were more likely to exhibit dominant preferences second time around too but there were important differences between the preferences expressed in the two studies (despite attitudes remaining stable). The results suggested a greater weight on equity versus cost-effectiveness than suggested in the DCE data, and waiting time and distance travelled ceased to be significant.

To identify the implicit trade-offs between these concepts from real-world decisions, three case studies were conducted:

• The centralisation of vascular services, involving a trade-off between cost-effectiveness and geographical access.
• Waiting list initiatives for varicose veins surgery, involving a trade-off between cost-effectiveness and temporal access.
• The provision of smoking cessation programmes, involving a trade-off between cost-effectiveness and the distribution of benefits.

Assuming a cost-per-QALY threshold of £20,000 in each case, the following results are generated:

• For the centralisation of vascular services, travel is valued at less than £229 per mile
• For varicose veins surgery, waiting must have an implicit weight of at least £499 per month to justify the waiting list initiative.
• For smoking cessation, the implied minimum value of treating a person in the lower instead of the higher social class is £1445.

In general, the case studies provide some insight into the implied trade-offs between cost-effectiveness and each of geographical access, temporal access and equity; they also highlight the value in attempting to quantify trade-offs rather than assuming that they will be of the size or direction that initial consideration might suggest. Of course there are shortcomings, and primarily these are the result of serious difficulties in finding appropriate data with which to model outcomes.

In order to provide a framework for the NHS to make explicit trade-offs when there is conflict between the objectives of cost-effectiveness, equity and access, a PowerPoint presentation has been developed, which can be presented as a core presentation of about an hour or extended using more group work to use in service training days. Initial piloting of the presentation has proved encouraging and further development of appropriate educational materials is needed. We hope
Discussion

Decision-makers at all levels in the NHS seem interested in exploring the potential trade-offs between cost-effectiveness, equity and access but they have insufficient information or data to make explicit, transparent decisions. It is clear from our work that trade-offs could be communicated more clearly if they were illustrated using the decision makers own experiences as worked examples.

There is currently much talk about evaluating health care according to economic criteria, such as cost-per-QALY but the data available for such assessment are still very scarce. Equity is another important policy goal yet the effect that policies have on the distribution of QALYs across different population subgroups is in even shorter supply. And while access – both in terms of distance travelled and time spent waiting – are also both important policy objectives, the effect that decisions will have on these objectives is rarely quantified. This project has served to highlight how lacking, and yet how important, such data is.

This project has provided some ways in which trade-offs between concepts from actual decisions can be inferred. With the availability of better quality data in the future, it might be possible to provide more robust estimates across more contexts, and thus show how consistent decision-making is in the NHS. Appropriate incentives can then be put in place to ensure that decisions are more consistent with stated policy objectives.

Even with good data, policy-makers must be aware of the fact that the preferences of decision-makers in the NHS are heterogeneous. The heterogeneity reported in this project suggests that any change in policy and service configuration that have implications for cost-effectiveness, equity and access may always be unpopular with some decision-makers, who themselves may have different preferences to the general public.

The implied trade-offs in the case studies suggest that many NHS staff will not favour national policies for shorter waiting times and local services because the sacrifice in health gain is too great. More work is required to determine whether shorter waiting times and shorter journeys really are worth the high price in terms of health gain that may result.

Preferences and knowledge are clearly different throughout the different levels of health care delivery, and evidence from both the qualitative and quantitative work suggests that some of the concepts are not filtering down from the macro to the micro level. As a result,
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policies may not be passed down effectively to decision-makers at the meso and micro levels, with obvious implications for implementation.

There are a number of ways in which future research efforts into the trade-offs between cost-effectiveness, equity and access might be directed in order to improve policy implementation. Policy documents could be continually reviewed to determine whether the concepts are being used in a clear and consistent way and there is a need for further research around whether there is real understanding of the concepts, since lack of clarity may influence choices made in the real world.
Introduction

Access to health care was a founding principle of the NHS. However, it quickly became clear that access to health services was far from equal, and it is now recognised that a range of individual, community and health care system factors determine if, and how, people enter the health care system and how they are treated if they do enter it (Payne and Saul, 1997; Gulliford et al, 2001; Rosen et al, 2001). Access is still one of the highest priorities in the NHS but it is not all that matters. The NHS is also concerned about using its resources in the most cost-effective ways, so as to avoid waste (Department of Health, 1998), and it also has a commitment to equity, primarily defined in terms of reducing avoidable inequalities in health (Department of Health, 2000).

Priority-setting at all levels in the NHS needs to take due account of these objectives simultaneously and, particularly against the background of an ever-increasing demand on resources, there may well be occasions when the objectives conflict with one another. Health service providers would therefore like to know something about the relative importance that is given to cost-effectiveness, equity and access. However, currently no real guidance is given on how to balance the competing objectives.

The original brief from the SDO was explicit in its requirements for primary research to examine how those working in the health care system make trade-offs between cost-effectiveness, equity and access. In line with the SDO call, the focus of the study was on the prevention and treatment of coronary events. The call specified issues of cost-effectiveness across population groups for example social class. We were able to address this across the study as a whole and in particular using the example of smoking cessation.

Against this background, the current project had four main aims and eleven objectives associated with them:

Aim 1

Provide clear working definitions of cost-effectiveness, equity and access.

Objectives:

• Identify key literature that provides definitions of cost-effectiveness, equity and absolute access.

Review the ways in which the concepts are used in official NHS documents.

• Investigate what decision-makers at the macro, meso and micro levels mean by these concepts.
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**Aim 2**

Show how decision-makers think cost-effectiveness, equity and access should be (and are) traded off against one another.

Objectives:

- Develop new instruments to show how decision makers think the trade-offs between cost-effectiveness, equity and absolute access should be (and are) made.
- Estimate how decision-makers think general trade-offs between cost-effectiveness and equity should be (and are) made, using instruments that have been administered on population samples.
- Compare the preferences of decision-makers with those of the general public, and investigate what decision-makers see as the reasons that lie behind any differences.

**Aim 3**

Identify the implicit trade-offs between these concepts from real-world decisions.

Objectives

- Assemble and analyse information on NHS service provision that allows the trade-offs between the concepts to be implied from recent decisions.
- Use these results to estimate the implied weight given to each of the concepts by current decisions about how to provide health services.

**Aim 4**

Provide a framework for the NHS to make explicit trade-offs when there is conflict between the objectives of cost-effectiveness, equity and access.

Objectives

- Produce an ethical framework for further debate within the NHS about cost-effectiveness, equity and absolute access.
- Develop methodologies, generic tools and decision aids for the NHS to use in other policy and planning areas in order to determine the ‘right’ balance between concepts.
- To disseminate the results as widely as possible so as to promote transparent and consistent decision-making.

The remainder of this report is divided into five sections, one for each of the aims plus a final section, which ties things up. Section 1 is concerned with providing clear and operational definitions of cost-effectiveness, equity and access. Sections 1.1 and 1.2 provide a
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review of the academic literature and key policy documents (objectives 1 and 2). Section 1.3 discusses the qualitative interviews with decision-makers at various levels in the NHS (objective 3). The results from all these subsections highlight that the concepts, particularly equity and access, have different meanings and are sometimes confused with one another. Despite this, in section 1.4, it was possible to provide some working definitions that also allow for quantifiable trade-offs between concepts. Cost-effectiveness is defined as the maximisation of health and equity in terms of reducing inequities in health. Access is measured in two ways: 1) the distance that people have to travel to utilise services (geographical access); and 2) how long they have to wait to use those services (temporal access).

Section 2 is concerned with the primary data collection studies that were designed to elicit the preferences of NHS staff in relation to the trade-off between different concepts. Section 2.1 reports on the results from a replication study (objectives 5 and 6). The results suggest that NHS staff are less willing to target resources to those with lower life expectancy at birth (the lowest social class and men in the questions) than a UK general population sample. They also have a less favourable view about patient representatives being involved in making resource allocation decisions. Sections 2.2-2.4 report on the results of a discrete choice experiment (DCE), a set of follow-up interviews and a pairwise comparison study (PC), all of which were designed to show how decision makers think the trade-offs between cost-effectiveness, equity and access should be made (objective 4). The results show that many respondents are willing to make trade-offs between concepts but that a significant minority have a dominant preference for health gain (or cost-effectiveness). The discussion in Section 2.5 generally favours the results from the DCE rather than the PC study and suggests that the number of people with dominant preferences may be reduced by the inclusion of general attitudinal questions.

Section 3 reports on secondary analysis designed to estimate the trade-offs between cost-effectiveness, equity and access, as inferred from real decisions (objectives 7 and 8). Sections 3.3-3.4 report on three case studies in the areas of the centralisation of vascular services, waiting list initiatives for varicose veins surgery and the provision of smoking cessation programmes. In estimating the trade-off between cost-effectiveness and each of geographical access, temporal access and the distribution of benefits, respectively, some important trade-offs that are usually buried within a largely political decision were being made explicit. Section 3.4 discusses the results in general, where the availability of reliable data presents a real problem. Section 3.5 compares the results from the implied trade-offs with those from the DCE study, and shows how, in very general terms, the results are broadly consistent with one another.

Section 4 provides a framework for the NHS to make explicit trade-offs when there is conflict between the objectives of cost-effectiveness, equity and access (objectives 9-11). A PowerPoint presentation has
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been developed, which can be presented as a core presentation of about an hour or extended using more group work to use in service training days. This is included as Appendix C.

Section 5 summarises the results from the study and provides some suggestions for future research. The most pressing research need is identified to be the collection and analysis of better quality data about the consequences of different policies and interventions for cost-effectiveness, equity and access.
Section 1 Providing clear working definitions

1.1 Introduction

In order to ensure that policies are implemented as intended, it is important that concepts are defined clearly and consistently at all stages and levels of the decision-making process. In empirical work involving surveys and questionnaires, it is essential that researchers have a clear idea about how respondents are interpreting their concepts.

Cost-effectiveness requires that outputs for given inputs are maximised (or minimise inputs for given outputs). But how are outputs to be defined and measured and over what population groups is cost-effectiveness information to be aggregated? In principle, equity is easy to define – following Aristotle, it requires that equals are treated equally and unequals treated unequally in proportion to their relevant differences. But how do we decide whether two individuals are equal, and, if they are judged to be unequal, how does this convert into a just distribution of health care? Access has been the subject of academic and policy debate for decades now. In general terms, access requires that people are able to use health care services that have some beneficial effects on their health (Gulliford et al., 2001). This requires that effective services are available and that there are no barriers that limit utilisation (Rosen et al., 2001).

In order to provide clear working definitions of the concepts, and in line with the objectives under this aim, the ways in which these concepts have been used in the academic literature and in key policy documents over time were reviewed. Decision-makers at the macro (national), meso (regional) and micro (individual patient) levels were also interviewed about how they have used these terms. The following three subsections report on the findings from each of these sources. Section 1.4 provides a summary and a comparison of the results from the literature review and the interviews.

1.2 The academic literature review

This section reports on a brief overview of the academic literature in health economics and public health regarding the use of the three main concepts of “access”, “equity” and “cost-effectiveness”. The review is not intended to be comprehensive but rather to highlight how the terms are used – sometimes differently – in health economics and public health. A definition of “need” is given first because each of the main concepts is often discussed in relation to it.
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1.2.1 Need

Ethics has often used the term “need” to indicate ill health, so that the more ill somebody is, the more they are said to be in need. For example, Doyal (1995) sees health as a “basic human need”, and Singer (1993) argues for the 'principle of equal consideration of interests', where one’s health needs are given equal consideration to someone with a similar health problem. However, what if a seriously ill person could gain very little, or even no benefit from health care while a less seriously ill person could benefit greatly from health care? Which of them needs health care most?

Health economists have addressed this issue, and typically think of need in ways that take account of what can be done with the ill health (and the public health literature is largely in agreement with this). One such approach defines need as the 'capacity to benefit from treatment'. In other words, one is said to need health care to the extent that one has the potential to benefit from health care, so that one does not need ineffective health care (Williams, 1974). An alternative is to define need in terms of resources (as opposed to outputs), and claims that need is the 'expenditure required to exhaust capacity to benefit' (Culyer and Wagstaff, 1993). To illustrate the difference between these concepts, suppose there was a technology advance that made it possible to provide a given health care service at half the resource cost, all other things the same, the health care needs of patients will be unchanged under the first definition, and reduced by half under the second definition.

1.2.2 Access

Ethics offers no clear definition or operationalisation of the term or concept “access”. However, some have argued the individuals have “a right of access to health care” so that they can maximise their human potential and their ability to help others (so that, in turn, those individuals can achieve their human potential) (Doyal, 1995). Nevertheless, given scarcity of resources, the right to health care that individuals have must be understood as a “qualified right”.

Health economics offers two ways to think about access. One holds that access can be measured in terms of the money and time costs that individuals face when consuming health care (Le Grand, 1982). In other words, it is when the amount of other goods that people have to give up in order to consume a unit of health care, or the relative price of health care, is the same across everybody, that they are said to have identical access to health care. However, while relative prices will be the same across individuals, the size of the overall budget and thus the total amount of consumption may not coincide, so that the potential to consume health care may be very different across individuals. Thus, the second operationalisation of access uses the concept of maximum attainable consumption, which represents the level of health care consumption achieved had the individual devoted
all her income to the consumption of health care (Olsen and Rogers, 1991). If individuals have different levels of income, then clearly, equal relative prices will result in unequal levels of maximum attainable consumption of health care and other things. This implies that relative prices have to reflect variation in income levels in order to achieve equal access across individuals with different levels of income.

Note that under both ways of thinking about access, equal access to health care does not necessarily lead to equal utilisation of health care. More specifically, suppose two individuals had equal access to health care (and equal needs), but different attitudes towards their own health, then the two individuals may well have rather different utilisation levels. For this reason, health economists are in general dismissive of using measures of utilisation as proxies of access. Further, health economists can be divided into those who recognise an intrinsic value to equality of access (e.g. Mooney 1994) and those who treat equality of access as instrumental (because it contributes to better and/or equal health: e.g. Culyer and Wagstaff 1993). There are also those who argue for instrumental value in the sense that the knowledge of equality of access to health care within a given community might contribute towards social solidarity or generate 'participation utility' (Margolis 1982).

In the public health literature, key to the understanding of the concept of “access” is a mismatch between the provision of health care and the need for it. The “inverse care law” (Tudor Hart, 1970) points out how those most in need of health care are usually those for whom it was least available. In this context, equal access plays an instrumental role towards reducing health inequalities between the advantaged and the disadvantaged in society. There are three main ways in which access has been operationalised for measurement. First, by using indicators on service provision e.g. the number of doctors or hospitals for a defined population. Second, by using utilisation indicators, controlling for need e.g. lower revascularisation rates for people from lower socio-economic groups with coronary heart disease (Payne and Saul, 1997). Qualitative studies have also explored some of the reasons for observed lower rates of service use by more deprived populations (Tod, et al, 2001). And third, by using consumer costs e.g. travel time/distance/cost and waiting times. Each approach provides an imperfect proxy for access. The first two approaches rely on supply side factors and relationship between use of services and clinical need is known to be complex (Goddard and Smith, 1998). The third approach, while looking at the demand side, fails to account for any differences in patient preferences.

### 1.2.3 Equity

The principle of justice and equity in the ethics literature, which is usually attributed to Aristotle, states that “equals should be treated equally (horizontal equity) and unequals should be treated unequally
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(vertical equity), and in proportion to the relevant inequalities”, and thus indicates that not all equality is equitable, or that not all inequality is inequitable. However, if equity is to be realised or measured, then agreement is required on what are the ‘relevant’ distribuenda (Sen, 1980).

Financing public health care through proportional taxation would be a policy example of vertical equity, because those with different incomes are taxed different amounts in proportion to the difference in income. Or, regarding horizontal equity, three ways of looking at this have been proposed: 1) equal expenditure for equal need; 2) equal utilisation for equal need; 3) equal access for equal need. As can be seen, each will depend heavily on the definition of need (and access). Culyer and Wagstaff (1993) have demonstrated that, not only are these principles inconsistent with each other at the conceptual level, but resource allocations prescribed by these will not coincide with each other except by accident. Thus, the policy implication is that no intervention can achieve some general notion of equity without first clarifying what is meant by this concept. This will be a recurring theme in this report.

There is a debate amongst health economists about whether or not equality of health at the individual level is tenable as an equity principle. While some have argued that, since health is the basis for individuals to flourish, equal health is an essential component of the principle of equal opportunities (Culyer and Wagstaff, 1993), others have argued that imposing equal health to all by violating scope for individual choice (to be less healthy in order to pursue other goods) is elitist and/or paternalistic (Mooney, 1994). Note that both positions assume that health has instrumental value, as opposed to inherent value, which makes the debate parallel to the one concerning the distinction between utilisation and access. As seen above, the typical criticism from health economics against the use of utilisation data to approximate access was that it implies disregard for variation in individual preferences.

The public health literature has approached the issue of equity in terms of inequality of health at the subpopulation level. This is based on the observation that certain portions of society, most often the socio-economically deprived, have worse mortality and morbidity experiences than those more affluent. Thus, interventions that reduce health inequality between such groups are seen to promote equity. These range from population-based (more progressive and redistributive taxation) to individual-based (advice about benefits entitlement). This view assumes that the evaluation of measures to promote equity should be based on their impact on health. The outcome of a fairer society is a society with a more equal distribution of health, in particular better health outcomes for the worse off.
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1.2.4 Cost-effectiveness

Cost-effectiveness is the most straightforward of the concepts, and the issue here seems to be not so much what the concept means but whether or not it should be pursued as an objective. A cost-effective intervention is one that brings about the most benefit, given costs (or, equivalently, produces a given benefit at least cost). Value for money and efficiency are also often used as near equivalent terms. Cost-effectiveness is a relative concept, and cannot prescribe on its own whether or not a specific intervention should be undertaken. It is only when a specific threshold (e.g. set by bodies such as NICE) is brought into the picture, and combined with the results of cost effectiveness that this judgement can be passed.

Cost-effectiveness is irrelevant if it is not acknowledged that more of the target outcome is good. In the ethics literature, there has been a debate regarding whether indeed saving more lives is better than saving fewer lives. Glover (1977) distinguishes between a number of positions ranging from one extreme where it is wrong to save one person's life in preference to another so that if both cannot be saved then neither should be, to another where it becomes acceptable to kill a smaller number of people in order to save a larger number of people. An intermediate position is the one adopted by much of health economics and public health, and this holds that a larger number of people being saved is a good thing provided that the other lives that are lost as a consequence of the decision result from “omission” (i.e. not getting the care) rather than an “act” (i.e. euthanasia to free a bed). However, there are philosophical arguments that deny the distinction between omission and acts (Harris, 1980).

There is much debate, then, within the academic literature about what the concepts of cost-effectiveness, equity and access mean, what their relevance is for public policy, and about how they should be measured for practical purposes. Do policy documents reflect this lack of clarity or are consistent definitions and measurements of the concepts adopted throughout?

1.3 The policy documents review

This section reports on the review of key policy documents regarding the use of the terms “access”, “equity” and “cost effectiveness”. Note that whereas the above review of the academic literature has concentrated on the concepts, the review here on the policy documents looks at the ways in which the terms have been used. The review is largely indicative and aims to show whether there has been a change in the use of the three core terms over time, and whether there are differences between different initiatives, between central and local NHS bodies, and between generic and specialities. The documents reviewed for each of the questions are listed below.
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Has there been change over time?

The Beveridge Report (Bannatyne et al., 1942)
The Health Divide (Townsend et al., 1988; also known as The Whitehead Report)
Working for Patients (Department of Health, 1989)
Patients Charter (Department of Health, 1993)
The New NHS: Modern, Dependable (Department of Health, 1997)
The NHS Plan (Department of Health, 2000)
Your Guide to the NHS (Department of Health, 2001; revised Patients Charter)
Social Services Performance Assessment Framework Indicators 2001/2 (Department of Health, 2002)

Is there a difference between different initiatives?

Access to Health Care, Report of the Scoping Exercise (Guillford et al., 2001)
Tackling Health Inequalities: Programme for Action (Department of Health, 2001)
Is there a difference between central and local NHS bodies?
Sheffield South East PCT Annual Report 2001/2 (Sheffield South East PCT, 2003)

Is there a difference between generic and specialities?

NSF Coronary Heart Disease (Department of Health, 2000)
NSF Cancer Plan (Department of Health, 2000)
NSF for Older People (Department of Health, 2001)
NSF for Diabetes: Standards (Department of Health, 2001)

The review has been carried out by searching in various documents for instances where these three terms are used. The ways in which these terms are used are examined, with special attention paid to references
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to possible trade-offs across the three concepts. The use of two related terms ("equality of health" and "efficiency") has also been noted.

1.3.1 Has there been a change in the use of the three core terms over time?

Access

In The Black Report (1980), while a distinction between access and utilisation is made at the conceptual level, utilisation data are presented to discuss equality of access across social classes. The role of access in The Black Report is not unambiguous: at one level, it can be interpreted that equality of access (and utilisation) is treated as a means to an end, since it is presented as one of the explanations of inequalities in health status. However, at another level, it explicitly acknowledges that equal access is a fundamental principle of the NHS. A similar indifference between access and utilisation can be seen in The Health Divide (1988), where the discussion of equity (see below) uses the terms “access to available care” and “utilisation” interchangeably.

The Patients’ Charter (1993) grants the public the right to access health care on the basis of clinical need, regardless of ability to pay or lifestyle. The phrase “fair access” appears in The New NHS: Modern, Dependable (1997), The Acheson Report (1998), and The NHS Plan (2000), and in all cases, the term is used in relation to people’s needs. The Acheson Report and The NHS Plan also use the term “equitable access”. In The NHS Plan, “fair access” is explained as equal access to health care for equal need, regardless of location and ability to pay. The level of access is measured in terms of waiting time. The NHS Plan also mentions access to information. Your Guide to the NHS (2001) operationalises access as a guarantee to a general medical professional within 24 hours for all patients (presumably regardless of need). In Social Services Performance Assessment Framework Indicators (2002), “fair access” is defined as: “The fairness of provision in relation to need”, but there is no definition for “fairness”. Rarely is there a definition of “need” given in any of these documents.

Equity

The objective of Sharing Resources for Health in England: Report of RAWP (1976) was the equitable allocation of resources across geographical regions, reflecting the variation in relative needs. Need meant ill health, and was represented by demographic information (age, sex, mortality rates). The Health Divide Report offers a discussion on what is equity, by introducing a distinction between equity in health and equity in health care. Equity in health requires that “everyone should have a fair opportunity to attain their full health potential” (emphasis in original), but this is an ideal so that in practice there will be health potentials that remain unexploited due to
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unavoidable circumstances, which are not necessarily inequitable. On the other hand, equity in health care implies “equal access to available care for equal need, equal utilization for equal need and equal quality of care for all”. Thus, while not all inequalities in health are unjust, inequalities in utilisation amongst those in equal need are unacceptable. The report suggests that ill heath is the indicator of need, but this is not addressed explicitly.

The Acheson Report defines the “principle of equity” in terms of: equality of quality of care and access to care across disadvantaged and non-disadvantaged populations; need-based allocation of resources; and targeting resources to those in worse health. As is mentioned above, The NHS Plan refers to “equitable access”, and also discusses charges and subsidies for private insurance/care in the context of equity. The term “equality” is used for variation in health: for instance The Black Report and The Health Divide Report are mostly devoted to inequalities in health across the social classes.
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Cost-effectiveness

Working for Patients (1989) had a strong emphasis on value for money, which was in effect equivalent to cost-effectiveness. The New NHS: Modern, Dependable (1997) uses the term “efficiency” to indicate the way in which the NHS will use resources to achieve value for money. The NHS Plan uses the term “clinically cost-effective”, but it is not clear what it means (for “clinically and cost-effective”, see item 3.4.3 below). The Social Services Performance Assessment Framework Indicators (2002) refers to cost-effective provision of services, but the actual indicators used are for costs and effectiveness separately, and there is no indicator on cost-effectiveness.

To summarise whether or not there is a trend in the use of these terms across time, a possible fluctuation in the usage of the term access may be observed, first as a neutral term interchangeable with utilisation, but becoming more value laden as in the phrase “fair access”. On the other hand, the term “equity” has been used in several contexts, and there seems to be no clear pattern across time. And finally, given the small number of documents that refer to the term cost effectiveness, it is difficult to see any trend though time.

1.3.2 Is there a difference between different initiatives?

Access

Access to Health Care (2001) defines three levels of access: to “have access to health care” (adequate supply of services are available); to “gain access to health care” (absence of financial, organisational, social, cultural barriers to utilisation); to “gain access to satisfactory health outcomes” (relevant and effective service for population). Further, in terms of assessing access, the above availability and barriers have to be evaluated with reference to diversities of groups. Tackling Health Inequalities: Programme for Action (2001) associates “fair access” to the reversal of the “inverse care law”. In it, improved access to services is a means to reduce health inequalities, i.e. their own main objective. NICE Guide to the Technology Appraisal Process (2001) does not mention the term access.

Equity

Access to Health Care defines equity as mobilising resources to meet the needs of the different groups of the population, and thus sees equity as a key indicator of access. Tackling Health Inequalities: Programme for Action argues that a “one size fits all NHS has not produced equitable health outcomes”, but does not give any indication of what distribution of health outcomes would be equitable. A related document (on equity audits as part of the Tackling Health Inequalities: Programme for Action initiative) gives formal definitions of health
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inequity and health inequality: “health inequity describes differences in opportunity for different population groups which result in unequal life chances, access to services, nutritious food, adequate housing and so on. These can lead to health inequalities”; "health inequality describes differences in health experience and health outcomes between different population groups." NICE Guide to the Technology Appraisal Process does not use the term equity, but does mention “reductions in health inequalities” as something their decisions may take into account.

Cost-effectiveness

There are two occasions in Access to Health Care (Guilliford et al., 2001) where the relationship between cost-effectiveness and equity/access is mentioned. They read: “achieving greater equity will often result in utilisation of services by those with lower capacity to benefit”; “there is a need to consider how cost-effectiveness fits with considerations for equity and access.” Tackling Health Inequalities: Programme for Action has no references to cost-effectiveness or efficiency. NICE Guide to the Technology Appraisal Process refers to the terms costs and benefits, but rarely uses the terms cost-effectiveness, efficient or efficiency, which may be unexpected.

To summarise, the core terms access and equity seem to be used in different ways across different policy initiatives. It is interesting how access is a means to equity under the Tackling Health Inequalities documents, whereas equity is an indicator for the Access to Health Care initiative. Access to Health Care considered the possible conflicts between cost-effectiveness and their primary objective (access), but the other two documents did not address possible conflicts.

1.3.3 Is there a difference between central and local NHS bodies?

Access

Both Sheffield West PCT Annual Report (2003) and Sheffield South East PCT Annual Report (2003) refer to faster access to services. Sheffield West PCT Annual Report also refers to access to information, while Sheffield South East PCT Annual Report mentions widening the range of services.

Equity

Neither Sheffield West PCT Annual Report nor Sheffield South East PCT Annual Report uses the term equity. However, Sheffield West PCT Annual Report uses the terms race equality and inequalities in health, while Sheffield South East PCT Annual Report uses the terms health inequalities and wider inequalities (in background socio-economic factors).
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Cost-effectiveness

Neither Sheffield West PCT Annual Report nor Sheffield South East PCT Annual Report uses the term cost-effectiveness or efficiency.

To summarise, from the limited documents reviewed, there is no evidence of equity and cost-effectiveness having central roles at the meso level, in contrast to the macro level. Also, the local documents do not use the phrase “fair access”. This suggests that the concept of cost-effectiveness is not filtering down to the micro level.

1.3.4 Is there a difference between generic and specialities?

Access

None of the National Service Framework (NFS) documents reviewed give formal definitions of access. All the NSF documents reviewed except for NSF for Diabetes: Standards (2001) mention “fair access”, and NSF Coronary Heart Disease (2000) operationalises it as whether or not all those eligible for treatment have received care. Eligibility for treatment is not defined, but there are references to geographic, socio-economic and demographic variables. All documents use the term “access” interchangeably with “utilisation”, as in “the way people access services”. But the term is also used to mean provision of service (independently of whether or not people use it), as “extend access to services”. NSF for Older People (2001) is about a specific population, as opposed to a specific disease area, and there is much concern over both “unfair discrimination in older people’s access to care” (which is clearly a supply side issue, although it can change expectations on the demand side) and the “low relative rates of access” to specialist care in this population (which can be both a supply side and a demand side issue).

Equity

NSF Coronary Heart Disease discusses equity in terms of variation of services and resources. Equity is about targeting resources to those in greatest need and those with the greatest potential to benefit. NSF for Diabetes: Standards defines equitable services as those that are planned to meet the needs of all groups within the population. The other documents do not give explicit definitions. There is reference to “the most cost-effective and equitable means” (NSF for Older People) and “adequate and equitable supply” (NHS Cancer Plan, 2000), with no reference to potential trade-offs between equity and other objectives. All documents refer to variation in health as “health inequalities”.

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Cost-effectiveness

None of the NSF documents reviewed offers a formal definition of cost-effectiveness. All documents make use of the phrase “clinically and cost-effective”, suggesting compatibility between these two terms. NHS Cancer Plan and NSF for Older People also use the phrase “appropriate and cost-effective”. NSF Coronary Heart Disease uses cost-effectiveness and efficiency interchangeably to represent “good value for money”.

To summarise, although these documents belong to the macro level of the NHS hierarchy, in some sense these documents concerning specialities may be closer to the micro level, because they address issues of barriers to utilisation, for example, from the perspective of what happens to individual patients. Whereas the use of the term access seems similar to macro level documents, the use of the term equity is restricted to variation in inputs as opposed to health outcomes.

Overall, the policy documents tend to use important terms without giving clear definitions, or accounts of how they are to be measured. This may lead to confusion on the ground, since the documents fail to give clear and unambiguous instructions on what should be done in a specific context when different initiatives, or interpretations, come to conflict with each other. However, the lack of clarity may also be an indication that there is a hidden assumption held by the authors of these policy documents that most NHS staff will know what access, equity and cost-effectiveness mean, and that they are important concerns for the NHS. The next section reports on a survey that explored the ways in which NHS staff actually interpreted these terms.

1.4 The interview study

The main aim of the qualitative in-depth interviews was to gain detailed insight into what decision-makers at the macro, meso and levels of the NHS understand about the concepts of equity, access and cost-effectiveness, with a view to providing information that could feed into the quantitative surveys described in section 2.2.

1.4.1 Methods

Drawing on our own knowledge of health service delivery and organisation, 30 individuals were purposively selected as potential interview respondents. The invitees were a range of decision-makers working at macro, meso and micro levels of the NHS in a range of urban and rural settings, and in areas with varying levels of social deprivation and minority ethnic populations. A letter of invitation with a general description of the project and details of the interviews was sent out by post. Assurances of confidentiality and anonymity, and an acknowledgement of the complex and politically sensitive nature of the
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research topic were given, as well as information that the interview would need to be tape-recorded for a full and accurate recording of the discussion and subsequent analysis. Seventeen respondents agreed to be interviewed. In addition, a 'pilot interview' was arranged with a local public health specialist.

Some of those who had agreed to participate in an interview had difficulties keeping their original and alternative appointments, such that, finally, 14 interviews were conducted. Twelve took place as face-to-face meetings, and two were carried out over the telephone. Four of the interview respondents work at the macro-policy level, five at the meso-commissioning level, and five at the micro-clinical management level. The 14 interviews took place between April and June 2003. The sessions varied in length, lasting between 30 - 90 minutes, with most taking about an hour.

Although an interview schedule was used, sufficient time and encouragement were provided for the respondents to raise and discuss issues and topics they deemed relevant, of concern and/or interesting. This flexible approach means that ‘insider’ perspectives and priorities could be identified and analysed as well as those identified by the project team. Each interview began with a brief description of the study, its main stages and their various aims and objectives, and the specific role of the aim one interviews. An opportunity was given for the respondents to ask questions before the interview began. Before beginning the interview questions, respondents were asked to provide a brief résumé of their educational background and their current and past employment, to place the individual’s responses within their particular context and facilitate some comparative analysis.

The interview schedule was as follows:

• The interviewee’s understanding of the concepts of access, equity, and cost-effectiveness.

• If, why and how the interviewee thinks the concepts have emerged, developed and changed in emphasis and definition in policy and practice over time.

• If, as a decision-maker, s/he thinks in terms of access, equity and cost-effectiveness when planning, changing or providing health care services.

• Whether s/he feels the concepts are useful.

• How the interviewee feels their understanding of access, equity and cost-effectiveness corresponds to, or varies with, those of colleagues/other decision-makers/academic perspectives.

• What ways s/he knows for measuring access, equity and cost-effectiveness.

• How the interviewee would set up and monitor/evaluate a service/intervention, in terms of taking the concepts into account.
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- What issues/dilemmas s/he identifies in decision-making; whether they are seen to involve trade-offs between competing concepts, and if so, how they are dealt with/resolved (or not). [not to use the specific term unless/until respondent does so.].

- How the interviewee thinks her/his own approach to decision-making compares to those working in different positions/at different levels of the NHS/government, now and in previous decades?

To conclude, interviewees were asked for any further comments they saw as relevant/important to access, equity and cost-effectiveness in NHS decision-making. Interviewees were also asked to identify what they considered their main message or priority concern in decision-making.

Each interview was transcribed verbatim and the 14 transcripts entered into the qualitative data analysis software programme 'ATLAS.ti' (Sage, 1997). The interview transcripts were first examined individually, then as a dataset. At three different stages of the analysis process, members of the project team carried out 'credibility checks' of the researcher’s methods. This was to confirm the meaning, application and organisation of the primary (initial) codes, the identification and naming of emergent themes and categories, and subsequent focus on key topics and issues. This collaborative approach establishes the 'trustworthiness' of the findings (as recommended by Erlandson et al, 1993, Marshall and Rossman, 1989).

In addition, the rigour of the data coding and text searching process has been enhanced by the use of computer technology. The analysis of the data was undertaken using the framework approach developed by Ritchie and Spencer (1994). This approach was developed specifically for use in applied policy research, which is often constrained by time and the need to answer specific policy issues. In addition “the data collection tends to be more structured than would be the norm for much other qualitative research and the analytical process tends to be more explicit and more strongly informed by a priori reasoning.” (Pope et al, 2000)

Appendix A provides details of the coding process and code list. Many of the issues discussed recur across the sample, and many are associated with one another. Some of the issues are very similar, and relate to a general point or subject area, consequently these have been brought together within one code label. Data codes therefore have a range of properties and importantly, these include a spectrum of views or dimensions. For example, data coded 'Resources' includes comments about the importance, or otherwise, of the budget size to the way decisions are made, and comments about the availability of staff time for measuring who uses their services.
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1.4.2 Results

All three concepts are widely identified as complex and multi-dimensional, with several respondents appearing to have difficulties describing or explaining them. Sometimes, the respondents recognise explicitly the difficulties, whereas sometimes they are evident in the way the respondents speak, for example, by how much they contradict themselves or falter. How the respondents speak about the concepts not only indicates how difficult they find them intellectually, but also how important they think they are, or feel they should be, in decisions about NHS provision. Some respondents give quite simple descriptions of the concepts, especially at the beginning of their interviews, but nearly all acknowledge the complexity of the notions in practice later in the session. A small selection of interview extracts is provided to illustrate some of the findings. The number at the end of each extract indicates the respondent identity and quotation number.

Basic understanding of concepts

The 15 codes used to describe the topics, issues and terms most commonly and widely identified in the first question about understandings of 'Access' were:

- Accessibility - timeliness of use: waiting times/lists...
- Accessibility - physical/distance/travel/location...
- Quality - acceptable/sensitive 'appropriate' care
- Availability/provision/level of service; volume/numbers
- "Need"
- Accessibility - getting through system/stages; referrals
- Complex/difficult/different types/levels of concept...
- Ethnicity/culture/language/minority groups
- Use in relation to need
- Central agenda/macro government priorities........
- "Socio-economic"/"deprivation"/"inequalities"... influencing health
- Different/shared perspectives on concepts
- Health in/inequalities; variations
- Feelings or thoughts about concepts/decision role
- Disadvantaged communities/areas/groups

In this list and elsewhere, the codes generated 'in vivo', i.e. those taken from actual words and phrases used in context by the respondent, are indicated by the use of double quotation marks to distinguish them from the 'a priori' codes, i.e. the codes that were set beforehand by the analyst.

Access is identified widely as a multi-dimensional concept, with different aspects highlighted by different respondents, and with timeliness seen frequently as the top government priority for the NHS.
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Access

For most participants, access is a difficult and complex concept to describe and define. It is seen by all participants to involve numerous components, with some differences in understanding levels relating to the individuals' roles and responsibilities, and with some components seen as more important and relevant by/to some individuals/groups than others. Several participants highlight the contrasting amounts of attention afforded the different components in NHS policies and practice, and how priorities change over time. Differences are also seen to vary in relation to the contrasting perspectives and roles of service users, clinicians, managers, politicians and academics.

Well as a word it does depend a little bit on what context you’re talking about it, so it’s a little bit difficult...For example, the latest concept...the National Priority is expressed in terms of Improvement, Expansion and Targets. Access to the Secretary of State means waiting times, and there’s an element within of health inequalities, where it starts to talk about access of disadvantaged communities of certain services, so it might mean some of that. For people here locally it means physical access to services. "Can I actually get to a service? Is it near to where I live? And they’re not unrelated...for most services the closer you are physically, the more use you’ll make of it, and the more articulate and powerful you are in the community, the more use of services as well 2:50

'Access' in terms of improving health, and discussions about health inequalities, are often differentiated by participants from their discussions about access in relation to having or getting health care provision. Most talk mainly, at least initially, about their understandings of access in relation to health care, with some assuming that health care automatically results in health improvement and no acknowledgement of the different levels or rates of improvement for different people or population groups.

The relative levels of importance afforded the three concepts, and the changing levels of priority of the concepts in NHS policies over time, are highlighted most often and quickly in relation to discussions about access. Improving access is widely seen as the number one priority of the current (Labour) government and central management of the NHS, with an emphasis on reducing waiting times/lists and reaching various activity targets as the main foci of access initiatives. A few participants highlight that targets are not set for all types of service.

Well in today’s NHS it tends to mean access in relation to time. It’s largely weighted by waiting lists and at how quickly you can get access...along quite a defined set of time-limits...It’s not everything...it’s not particularly worried about access to mental health services, or MRI scanners or whatever, it’s basically a rigid set of...
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Definitions about first out-patient appointments, in-patient treatments and differences in times... Time between diagnosis and treatment in cancer and those kinds of things. And the other element has been about access to primary care and whether you can see a GP within 48 hours. So access has become synonymous with the NHS Plan and a whole range of targets.

Several participants also mention how long waiting lists have been identified by the government as the primary concern of the public and main criticism of the NHS, and seen by some, therefore, to justify, or at least explain, the government's focus on this dimension of access. But supporters of the focus on timeliness are keen to emphasise it not the only concern or target being worked towards.

You know, when you actually talk to people on the streets, the people of England, they'll say the issue with the NHS is timeliness. "What do you want from the NHS? I want a timely service", and I think that unless we really, really focus on timeliness it isn't going to happen. So in a sense we have to have this kind of focus on timeliness because it's the biggest thing.

Int. Do you feel it's the biggest thing because people really want that, or because it's the easiest thing to work on...you've sort of alluded to that?

It is easier...and we've invested a lot of time and energy on to how to do it over the last period as well. And it's what people in the street generally want, and when we look...in the popular press it's nearly always timeliness issues...[But] other issues are coming up and I think it's up to us as leaders to say this is what we have to do...And when you look at the government priorities, [there's] 13 other main sets of targets...two of them are access, but there's the inequalities agenda, the cancer agenda, the older people's agenda, the heart disease agenda, patient-public involvement agenda, the workforce agenda...we've got to hit all those things.

Several participants identify several other aspects to access, albeit they are recognised as lower government priorities for attention than waiting times and targets, and/or mentioned later in most interviews. For example, the most widely discussed access issue is accessibility which includes various factors that influence whether a service can be used easily by a person, when they need it. Factors highlighted often include service location and the influence of time and distance to travel on service use, and a range of public-private transport issues are mentioned. Also, many refer to the complex processes involved in getting through the system and the varying influences on getting
referrals for tests and treatments, and the importance of having convenient appointment times that fit in with other aspects of life.

Well I think of access to health services being about people's ability to use the service should they see themselves as needing it. But actually it's a complicated concept isn't it? I suppose if I break down the idea of access I think about it in terms of things about the patient or user that would maybe prevent or help them access the service, use a service. And so there might be things about them, things about the service, or things about the context that they live in or geography that might complicate things...You're talking about whether people can use the service that they may benefit from.

Various ways are described to measure or monitor access, with the amount of detail and views about their adequacy varying according to the particular component being discussed and the role and priorities of the individual participant. Several participants suggest that the prioritisation of quantitative components of access also relates to the relative ease of achieving objective change that can be recorded using simple techniques of measurement. Examples of access initiatives and the measures used are highlighted often. For example, the monitoring of the numbers/percentages using services; the measurement of various waiting times, such as the time spent waiting in Accident and Emergency clinics, and intervals between first contact with a service, getting a referral and receiving treatment are described by several participants. In this context, many discuss how 'use' is a common proxy measure for access, with some recognising various problems or limitations with it.

Actually it's often not information it's just straightforward data, and thereafter that dictates what they're measuring...They know about length of stay, they know about waiting times, even though they've still not addressed the issue about referral to operations... For very good pragmatic and political reasons, they measure what is measurable. And what I think we ought to be doing is saying "So what is this that it is achieving?"

Substantial cynicism about the focus on quantitative measures is indicated by a few participants, who highlight that reductions in waiting times or higher ‘percentage seen’ figures are not necessarily indicative of good quality health care or improvements in access. For example, a higher proportion of people getting seen and at greater speed can be achieved if less are referred to a service in the first instance, and waiting lists can be managed so as to treat easy or fast turn-over conditions rather than slow and/or complex cases. Both
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resource and political implications of success or failure to reach targets, for service providers and the government, are highlighted often. With the resource penalties tied into several targets, manipulation of the system is identified as a worrying concern by a few participants.

At the moment...what the Secretary of State is clearly only bothered about is waiting times, the rest is lip service. As an illustration, the planning guidance on coronary re-vascularisation sets targets only for waiting times...The thing that will get the chief exec. sacked is not meeting waiting time targets. Not meeting an activity goal...is not a hanging offence...For example, we know we have low re-vascularisation, we have some understanding of why, but pre-requisite for doing something about it is having the money to spend on it. But, we can tick all the boxes over the next three years on planning, so long as we hit the waiting times targets. The easiest way of doing that is to stop offering the service completely and then nobody waits...dampen down demand so that nobody gets into the system. So that what limited service we can afford is met quickly. That's all that seems to matter...I wouldn't glorify it with the term access. Waiting times are what matters, above all else...And there isn't a lot of room to do much about the rest

Several participants suggest that the most important access issue should be maximising health gain/outcomes, and many are critical of the emphasis on levels of activity rather than qualitative notions and measurements of success and improvement. Some highlight the need to consider both the experiences and outcomes of health care. A few suggest that various issues relating to the quality and outcomes of the experience are the main concerns of the majority of service users, and challenge the government's view that the public's number one pre-occupation is with speed and waiting lists.

In terms of a definition of access I see it as being able to get the benefit of appropriate services at the right time and in a timely fashion. It doesn’t particularly bother me if people don’t get access to services that aren’t appropriate, it does bother me if people don’t get access to the services they need and to which they can benefit.

It’s a very misunderstood issue...I mean obviously if I see someone with a coronary then I want access, first of all to immediate life support, and access to coronary angiography as fast as it can be humanly delivered, and no constraint on speed... But I don’t think speed of access is as important as the nature...and yet the government
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appear hooked on speed... We have some evidence... that if you were to ask a group of people who have either been through hip replacement... and those waiting for it, what they say is that from the moment they’re told by the surgeon that they need joint replacement, their preference was not for... next week. What they wanted was a decent interval in which to get psychologically... physically prepared, to get their finances in order, to get work sorted and everything else done. And the optimum interval would be from first being told, not from being referred... their preference is between 3 and 6 months. Now that’s not about speed of access. If you’ve got speed... down to 2 weeks that may sound virtuous, in fact it’s not. Equally, in primary care... many people talk about access as if immediate access to any health professional is the holy grail. I don’t think it is. I think it’s about quality... we get many people phoning up... saying "I want to see either Dr X" or "I want to be seen in an evening", and they sometimes will wait three weeks for an appointment... to suit their work... and yet on the statistics that looks like bad access... That’s quality of access, having an appointment at the time and with the person of your choosing. You sometimes have to wait and people are often prepared to make that trade-off. So ways in which access gets handled politically is uni-dimensional... It’s so multi-dimensional that as soon as you’ve reduced to one dimension you actually lose the richness of the notion 10:110

Despite substantial and widespread reservations about the 'targets and times' approaches to access, a few participants describe them positively, seeing timeliness and extent of use not only as important areas to work on in their own right but also as launch-pads for overall service improvements. Some also suggest that getting staff on board with current initiatives helps them see the potential for further change and improvements, and these participants see quality and equity issues following on and building up from quantitative initiatives. Several references are made to the organisational culture of the NHS: it is seen widely as generally resistant to change, but especially when change is imposed from outside. By starting with relatively simple and self-contained initiatives is seen to help change the stagnant culture and conservative mindset, and more complex and qualitative changes that challenge entrenched attitudes and behaviours become less difficult to implement. Nonetheless, some of these emphasise how it is very important for policy makers and service managers to recognise and acknowledge explicitly how staff are already working hard and very busy, and that implementing change is generally unsettling and time-consuming.

In a project that sets out to improve access and access targets, what it can do is bring about all sorts of other improvements. Because if you start to look at the process, if you start to involve all the staff and you
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said 'Well why don’t you do this, why don’t we do that?'. And it brings in the cost-effectiveness...and 'Is that the most clinically effective thing to do?', 'Why are we doing that?'...Redesigning...once we actually take time out of the system you start to analyse it and say 'Well why is this consultant making all these patients have a back x-ray?'. There's no reason to do that. And then you start to say 'Why is this being done in secondary care?' So I think if we go in a kind of improvement way, it starts to make us curious, to question.

Int  To question everything, not just the waiting time?

Yeah. And looking not just at timeliness but safety, effectiveness, equity. 3:456

In addition to the frequent discussions and different opinions about access in terms of the timeliness of use and quality issues, most also talk about access in terms of the amount or level of services provided and/or whether they are actually available to use. For a few this availability aspect is the starting point of their discussions about access, as they see there has to be a service provided before you can start to consider the adequacy of its organisation.

I understand it as being the availability of services, not only in terms of their actual physical presence if you like, but also in a timely fashion. So I think it’s people having the ability to come and see a cardiac surgeon, but not only that, but not having to wait for three years to do it. I think it’s that. 12:170

What does access bring to mind for you?

Different dimensions really...One is access to existing interventions...that are proven to be of real therapeutic value, and where we can, where we have established the cost-effectiveness of them. But in any event, access to interventions likely to have a beneficial impact on the patient's condition. So in other words, that they are actually available for people to get access to them in the health care system. And then time to access is the other dimension that immediately occurs to me. So in other words the intervention is available, how long do I have to wait, in order to get some benefit from it? So those two dimensions occur to me immediately...And there are other issues...which must be related I suppose. In relation to the setting in which the intervention or diagnoses are actually available...which is important in...organisational design and also from the perspective of the individual, in terms of what is most convenient to them 14:150
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For some participants, an 'accessible' service is one that involves an 'acceptable' health care experience, and this is identified as that where the service provided is sensitive and 'appropriate' to personal and cultural as well as clinical needs, providing both good standards of care and clinical effectiveness. This is where discussions about the relationship between access and equity become most explicit.

Certainly a big issue in my PCT is access in terms of language, cultural appropriateness of services. So there are issues in terms of...people being able to understand the language or, even if they do understand the language, not feeling able to access it because it's culturally inappropriate...Access also in terms of...the way we've set up the NHS it's predominantly geared towards semi-middle class, white English-speaking people, but anybody kind of outside that broad-brush approach...isn't going to be able to access services in a way that they would need to. And that's something we're very, very conscious of in this PCT because of the fact that nearly 40% of our population are from ethnic minorities...We also have a large proportion of asylum seekers and refugees...So huge diversity of language and cultural needs, and need to access services.

A few participants also discuss access/accessibility in relation to the impact of the physical structure and design of health care facilities on use. Details mentioned that make services easier or harder to actually use include the style and size of health care facilities, car parking, the width of doors, stairs/lifts and the provision of ramps, and the size of lifts for wheelchair users. A few participants see that these physical aspects of access were highlighted generally and addressed centrally more often in previous decades than in recent years. Some suggest that people at the micro and meso levels of the NHS still recognise these as significant issues that still need attention.

Int So what does access mean to you?

A number of things. There can be physical barriers, so you know, basic things Like things lying about and someone in a wheelchair having to negotiate it can be an issue. Entry to the building, so there's going to be physical barriers of access 6:40

Equity

The 15 codes used to describe the topics, issues and terms identified most often and widely in the first question about understandings of 'Equity' were:

• Use in relation to need
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- Access
- "Need"
- Availability/provision/level of services...
- Health in/equalities; health variations
- "Outcome"
- Complex/difficult/different types/levels of concept
- Values - value judgements/ethics/beliefs...
- Measuring - (e.g. using evidence/information/data...)
- Feelings or thoughts about concepts/decision role
- Resources
- Central agenda/macro-government priorities.....
- Disadvantaged communities/groups/areas
- Accessibility - physical/distance/location/travel...
- Accessibility - getting through system/stages; referrals

Initially, several participants appear to find equity quite difficult to describe and explain. However, a few are very articulate, and identify easily various issues involved in and aspects relating to the concept. Several participants describe equity as a value-laden concept that involves complex and contentious notions of social justice and fairness relating to equal rights and equality of opportunity. Prioritising equity and focusing on improving the health and opportunities of disadvantaged groups is seen to involve putting socio-political beliefs and values into practice but this is invariably at a cost to the more privileged. However, services can be provided in various ways and stages, for example as 'targeted interventions'.

My view [is] that everybody who's a smoker should have equality of opportunity, to have the support to give up, but to make sure we are cost-effective and we have access... [and] are as effective as you can get it, it's got to be targeted with people who genuinely wish to give up, and in a position to give up...use and get benefit from the service. Which may mean, paradoxically, that...inequalities widen...But then, when you've addressed the people who wanted to give up in the more affluent area and go to the people who wish to give up in the poorer area...you've got more smokers, more lung disease, more asthma. And then you continue to concentrate more and more on those areas, because of instead of just dealing with the easy, you actually start to address the more difficult underlying issues...You want to get the best bang for your buck, and therefore cost-effectiveness is about making sure where you store your global budget and bits of it, to try and get the best effects...If you break it down into very small bits...as one small subject, then your decisions are going to be flawed. If you see it as trying to deal with an entire area then you're much more likely to make better cost-effective decisions...So you have to look at wider
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dimensions...to get the best outcome.
10:112

Most participants discuss equity initially and mainly in relation to the differential 'use' of health services and varying "Need" for them, and many of these link differences in need to wider discussions about other non-NHS influences on health and health inequalities.

Equity to me is that people who again would benefit from the service, all people having the ability to benefit from a service should have equal access to it. So you know, no disparity, on the basis of all sorts of factors I suppose. So its socio-economics, age, whatever...and the whole inequalities agenda, in terms of deprived communities or marginalized communities that have problems, that have disproportionate prevalence of ill health...It's not just about socio-economic deprivation. It might be to do with age as well, because, for one reason or another, people's health may be disadvantaged.
4:164

Some participants talk mainly about equity in terms of health care distribution and discuss this in relation to specific examples that demonstrate the variable allocation of resources/services in different geographical areas and clinical specialities. Although most participants discuss how unequal levels of provision can be equitable and relate to varying levels of need, a few talk mainly of different levels of provision as unfair and inequitable. A few are keen to emphasise and/or quick to highlight the differences between equity and equality, and many refer to notions of fairness and justice in the equitable distribution of services, whereby different needs are provided for differently and can contribute to the reduction of health inequalities.

Well I mean there's a difference between the term equity and the term equality. Equality means the same, but equity means more about fairness, therefore it has implications for, you know, greater needs should have greater response potentially. It gets to the issue of do the right people actually get and use provision
2:54

The usual definition would be the common definition of fairness. Namely "Have we got the resources for screening distributed equitably between children and older people?" Might not be equally, but would the men and women would think it was fair?...You could say equity is one health care objective...[so] you'd do some sort of policy impact of this health problem on this population, and the alleviation of the
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impact if the service were available...you'd try and do some sort of disease impact assessment 1:111

Only a small number of participants mention specifically the need to consider equity in terms of the "outcomes" from health care interventions. The terms "equity of outcome" and "equity of access" are referred to by a few of these participants. Connected to these issues, the role, economics and politics of targeted interventions is discussed widely. Targeting involves providing a service to a population/area on the basis of having an established greater need even though it may be less cost-effective and decrease access for others (those identified as less needy).

If you are going to run a health-needs-based model, then an equitable system is one supplying the service according to the need, not according to something like age or gender or whatever or geography. So it should be a service based on need and meeting the needs of the perceived and stated need of the population. So to me equity is about systems that don’t make it difficult for people with equal needs to get equal services. So it isn’t about saying the same service should be available in the middle of Birmingham as is available in rural areas, because rural areas have special needs. And an inner city has special needs. It’s about making sure that in any setting people have equal access if they have equal need, and making sure...the service is designed differently in the two areas in order to achieve it. It’s for the same end point, which is the equality of outcome, and of equality in experience 10:111

As evident above, the term "Need" is commonly found within discussions of equity, but its application and meaning varies. Some participants refer to, describe and define need in terms of the "capacity to benefit". Several highlight distinctions between need as an individual, subjective sense; as a clinically-defined, objectively identifiable and measurable condition, and as a level of disease defined and measured at a population/public health level.

I think equity is about giving people equal access to services that they need and for which they can benefit. Again I’m not terribly interested in equity to services for which people don’t have any particular need.

Int So what are you aspiring to if you're working towards equity?

To have a situation whereby no groups of patients were disadvantaged as compared to other groups in terms of accessing the services from which they can benefit. I deliberately, think it's useful to think in terms of groups rather than individuals, because groups of people should
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have equal access to services so that, you know, people who live in deprived areas should have equal access to revascularisation according to the need they have, for certain levels of angina, as compared to people who live in affluent areas.

Int So how would you define need?

Well 'Need' is the ability to benefit which may be straightforward, and correlated to clinical symptoms. With revascularisation for coronary heart disease it probably is because it's an intervention that is primarily about addressing symptoms. For some other conditions it wouldn't be about symptoms...it may be you want to treat an asymptomatic condition...be preventative 7:150.

The measurement of equity is described by some participants in relation to calculations that compare data on the incidence and prevalence of diseases for different population groups, and the levels of service provision and use for them. It is seen as relatively easy, and useful for planning services, to produce use: need ratios for different health problems, types of health care and population groups, provided there is sufficient data for valid sub-group comparisons. But most participants acknowledge that measures looking at equity in relation to health outcomes are rare, and see them as complex.

We looked at health inequalities as part of the Director of Public Health's annual report ...The easy bit was looking at inequalities that relates to geographical issues...comparing health status with this part of the city with that part of the city... Lots of measures were used, lots of data collecting, wherever. The difficult bit was looking at health inequalities that related to other dimensions such as age, gender, ethnicity, because of the lack of detailed information. It's not available. So what we ended up doing was actually using access to service utilisation so that needs are measured, by health inequalities. So, although access is a factor in terms of health and inequalities, it's only one aspect of it, but in terms of being measurable, being easily available to be measured, and describe the health status of a particular population group...it's difficult.

The frequency, enthusiasm and resources to work on improving equity - and monitor it in practice - is also seen to have been quite variable over time/with different governments, but most administrations are seen to give equity lower priority and attention than access and cost-effectiveness. The priority afforded equity at government level currently, and amount of attention to reducing health inequalities favoured by the public is contentious. Although some participants see health inequalities as a major concern of the current government, and improved equity as the main aim of several policy initiatives, this view is not shared widely.
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I think equity and cost-effectiveness may or may not be so important in relation to access because that's what people want, people expect. That's the kind of reality of the society that we're in, so we in the NHS have to respond to that as well. In terms of cost-effectiveness yes, over the last...4 or 5 years, and particularly with the National Centre for Clinical Excellence, that's really brought on the issues around cost-effectiveness...In terms of equity, I think equity has always been kind of been there, implicit or explicit, it's always been there. It went through a kind of period where, obviously the Black Report, and then obviously the issues around the response of the Government to the Black Report. And then all the period of time when it wasn't specifically discussed as part of the decision making process. And recognition of the fact that there has to be allowances made into policy, planning, that recognises the differences between the health status of the people...At the moment, certainly in the primary care trust, two kind of targets come to mind straight away...Can patients see a primary care professional within 24hrs? and...Is this PCT going to meet this target by December 2004? And that's an access target. Whether it's necessarily an evidence-based or effective target, or cost-effective or equitable I think that remains to be seen.

Some observe how inequalities were rarely acknowledged or attended to by the Conservative administrations from 1979 into the mid 1990s, and that the attention given to promoting equity by the current Labour government remains little more than lip service and based on rhetoric. Some participants illustrate the varying socio-political significance and value-laden basis of 'equity' by referring to the way terminology changes over time. What was identified and understood as 'health inequalities' in the 1970s, for example in the Black Report, was individualised and de-politicised as 'health variations' during the 1980s, representing the period of the Thatcher conservative administration.

I'd thought we were going to return to a health inequalities agenda, because I was on a group which worked under Virginia Bottomley producing a report called Variations in Health, and that was called as it was because it couldn’t bring itself to chew out the word inequality. And even then it was regarded by many as unacceptable social language. So what I hoped was that we were going to get back to a world in which we could openly talk about inequality and it would be high on the agenda. And they have, and the rhetoric is there, if you look through the documents like the NHS Plan, Our Healthier Nation, the inequalities agenda is there. They've a minister charged with inequalities, we've got a CMO who appears to be concerned about it. And yet almost nothing has happened. It's as if just to have a few reports is sufficient, and it really isn't. They are just as conscious.
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about cost-effectiveness. We need a general debate, a general forum in which we can decide whether or not, rather than just a pragmatic decision that is made

Although equity is widely seen as something good, and some participants highlight it as one of the founding principles of the NHS and motivation of many NHS personnel, initiatives organised to improve equity - such as targeted interventions - are also recognised as problematic. They are seen widely to involve more resources/reduced cost-effectiveness and, in a resource-limited context, necessitate reductions in other services, with some referring to the issue of trade-offs between the concepts

If you put smoking cessation services in an area where people are very willing to give up, you’ll get more people giving up per clinic, than if you put it somewhere else. So your services will inevitably be more cost-effective. Now that maybe that you end up with an inequitable service and that’s where the trade-off emerges...Similarly with re-vascularisation, if you concentrate on the relatively well-off middle classes who are generally healthier, get out of hospital quicker, don’t have peri-operative complications, do all the right things, you’ll probably get a better throughput and get more people operated on than if you concentrate on the sicker end of the spectrum, people within poorer socio-economic groups and so on. So if you want to maximise cost-effectiveness, you may well end up having an inequitable service, and this is one of the fundamental criticisms of the whole QALY approach isn't it? Because particularly with regard to age discrimination, maximising cost-effectiveness may well, will inevitably tend towards undermining equity. But there are some situations where promotion of equity and promotion of fairness and promotion of access are also cost-effective simply because...there’s a concentration of identified people with a need, and that’s more efficient and therefore more cost-effectiveness.

Interestingly, amongst those participants who appear most concerned about inequities and the most critical of the attention given to reducing them, are those who highlight the complex socio-economic factors that influence the unequal distribution of health, illness and mortality. They recognise that equity initiatives within the NHS need to be in collaboration with other key services.

It’s a funny thing equity of access, because it's only one of the issues about inequalities isn’t it? It’s access to health care we’re talking about, but it’s only one area, it’s access to housing, it’s access to jobs, it’s access to education, you know both at school level and higher
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education. So it’s a very broad concept, but in the health service, on the whole, people don’t think about those other areas. The people who work in, amongst those folks who are poor, or who have got poor health, they know about it, and some people have been famous champions of it, Tudor Hart and the inverse care law and all that...so it’s not so new, It’s just I think that as public health and public health policy has developed there is a recognition that that is the key issue. And interestingly in Sheffield for example, the Sheffield First for Health Partnership, between the city council and it’s organisations and the Health Service, has chosen inequalities as the theme that they are going to discuss and almost nothing else 1:72

It's generally been a poor deprived population here who've been seeking access to health care...[And] however well we try to configure services...there's all sorts of equity issues, around how those sorts of groups do. But they are already unequal in terms of all the other parameters of their lives, in terms of basic things like literacy, education and access to education, schools for their kids, and generally low attainment and all sorts of difficulties adapting to different culture. And therefore what happens to their health, despite what we do or don’t do, is all tied up really I think with how policies link across [different areas] and need to change, and how access issues, you know, whether people like that do get care fairly quick. They are a different group of people... but if you could somehow give these people the money directly, in terms of real income, that would obviously make a difference...I think people, if their health were better, would not need to access as much, and it would be a big influence on equity at all levels, and it would be more cost-effective. 5:290; 5:340

**Cost-effectiveness**

The 15 codes used to describe the topics, issues and terms most often and widely identified in the first question about understandings of 'Cost-effectiveness' were:

- Measuring - (e.g. using evidence/information/data...)
- Resources: funding/budget/finance...
- Issues in decision-making - choosing between/rationing/trade-offs...
- Quality issues - effective treatment/clinical effectiveness...
- "Cost"/"cost-benefit"/"utility/ "in/efficiency"/ "value for money"...
- Values - value judgements/ethics/beliefs...
- Access
- "Trade-offs"/"relative priorities"
- "Outcome"
- Issues in decision making - start/extend/change/close a service
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- Availability/provision/level of service; volume/numbers
- "Smoking" /"smoking cessation"
- Issues in decision making - targeted interventions
- "Need"
- Central agenda/macro government priorities...

The measurement of cost-effectiveness is seen as important, but as of extremely variable standard. For example, one respondent refers to the continuing frequency of “back of envelope calculations” based on ‘guessimates’ of costs and effectiveness, whereas others refer to the growing trend for ‘technology appraisals’. These involve rigorous examination and comparisons of research evidence of effectiveness and costing for different interventions, and produce recommendations and ‘guidance’ based on careful and complex clinical and economic evaluations.

Generally, cost-effectiveness is recognised as a more concrete and straightforward concept than equity and access. Cost-effectiveness is rarely described initially as something that is directly informed and shaped by political and personal beliefs and values. Indeed some participants appear reluctant to recognise ideological dimensions and discuss the concept in operational terms.

Int What does cost-effectiveness mean to you?

Cost-effectiveness? I prefer measurement to thinking about the meaning of it. I’m a logical positivist by background so therefore I also prefer empirical, objective measurement. So cost-effectiveness I would measure by the resources used in respect to the outcomes attached.

Cost-effectiveness is often described firstly as a pragmatic tool or measuring technique to support and facilitate greater objectivity and resourcefulness in decision-making, and help realise strategic aims. It is identified widely as something health service providers should consider and aspire to in decisions about service provision and organisation. However, the concept is seen as hard to achieve and/or rare in practice for various reasons, including definitional problems, lack of time, enthusiasm and/or skill, and data availability/quality.

Lets face it, it’s not always easy to measure cost-effectiveness because, what do you include, what don’t you include? What can you measure, or take account of? 6:312

One of the things…that really underpins all of this is actually about information and data. And I think decision-makers, particularly local
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decision-makers, haven’t got good data or don’t go through good
diagnostic processes in terms of making decisions...Very often... they’re
on a hamster wheel! It’s like activity equals progress equals moving
forward, yet the reality is that...some people are charging into change
processes without having really good data and understanding what the
options are...’Who’s doing this the best...? What are they doing?, How
much are they spending on it?’ And we just do so little of that...in
terms of issues like cost-effectiveness...What we’re not doing typically
is sitting down and really working it through and doing comparative,
you know, cost-benefit analysis...

3:201

The terms "cost-benefit", "efficiency", "value for money", "QALY" and
"bang for buck" are used often in the descriptions of and discussions
about cost-effectiveness in decision-making. Also, the need for
"trade-offs" is mentioned frequently.

Int  So what do you mean by cost-effectiveness? What do you think
about?

I think about trade-offs between. If you make a decision to buy X
instead of Y, what major benefits, health improvements, would you
achieve by that trade-off? There’s also an issue about value for money
and making sure there’s no greater cost than we need. And we may
have to accept that, certainly by the 'gold standard service for
everybody', we might not [achieve that], so it's kind of all those trade-
offs really...But also making sure...there’s a considered judgement
about how much a service provides. I don’t necessarily mean
quantitatively, I mean quality as well..

Int  So how will you establish whether something is cost-effective?

Well I’d bench-mark it with other, on a kind of value for money thing,
with these kind of national measures...Trying to look at what we can
compare it with...There are also tools like QALYs...or you could do a
cost-benefit analysis...Just trying to use some kind of tool that shows
you the cost compared with the benefit ratio. And you could use those
as a kind of comparator, to see what gives you the greater gain.

8:127

Definitions of cost-effectiveness vary in their amount of detail and
complexity, and views on its importance to decision-makers and the
public also differ, and sometimes conflict. Later in their interviews,
many participants recognise that beliefs and values influence notions
of what constitutes and how important cost-effectiveness is, and these
influence different approaches to and judgements about health care
priorities and provision, (just as much as ideas about the meaning and
importance of access and equity). For example, different beliefs and
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values influence levels of support for services focusing on: short or long term effects; prevention or treatment; the greatest throughput; those with greatest need, or those who will achieve best outcomes etc. As such, ideologies influence what is included within the formulae of any evaluation of 'costs' and 'effectiveness' as well as practical considerations.

Int  What do you understand by cost-effectiveness?

Well it's a judgement essentially...made about - given the totality of resource that's available to spend on maintaining the health status of the population...whether an individual intervention can be seen to be offering sufficient therapeutic value to justify its cost.

Int  And how do those decisions get made...?

Well as I understand the term, cost-effectiveness covers a range of different measuring techniques. Cost-benefit analysis, cost-utility analysis. Cost-effectiveness itself is a particular technique as well as a generic description... Ultimately, what those who look at the models - that underpins judgements about cost-effectiveness - would like to know, is the long-term benefit to patients. The ultimate benefit, in terms of its effect on length and quality of life on an individual...And often those data aren't available...hence the need for modelling and the need for assumptions to be built in. And quite often the model extrapolates from...quite short-term data for those desirable long-term end-points. 14:157

Whereas several participants highlight the comparative basis of cost-effectiveness assessments - looking at the relative costs and benefits of different interventions or at alternative service configurations - some emphasise the two distinct components of cost and effectiveness within the assessment. Some stress clinical effectiveness as the primary and most important component of any decision to provide a health service, with some talking mainly in terms of health, outcome and health gain, and others using more technical/economic terms such as benefit, utility and "QALYs". But others emphasise that costs - both financial and non-financial, including time, effort, skill, and training - should always be considered as equally important as effectiveness, recognising that all decisions are made in the context of scarce resources and therefore affect the availability of resources for alternative options.

Cost-effectiveness obviously has two aspects to it, one is about effectiveness. So, looking at an intervention, you could look at coronary artery bypass graft...and measure how effective it is in terms of reducing mortality or increasing life expectancy or quality of life... Cost then allows the comparison in terms of, say it's £10,000 to do a
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CABG. What cost-effectiveness does is give a comparator to other interventions that may or may not be similar in terms of outcome...[or] in terms of cost, to allow health communities...to understand how to prioritise. Because at the end of the day this is about finite resources, so we can’t ignore cost elements...Clinical effectiveness is very important, but you can’t divorce clinical effectiveness from cost.

Despite general support for cost-effectiveness in principle, cost-effectiveness is recognised widely as difficult to calculate accurately in the 'real world' because of the paucity of good research evidence/data, limited time for calculation and pressures from 'society'.

I don’t think we should be pumping money into interventions which aren’t cost-effective, but the problem is we don’t have a lot of evidence...[and] as a commissioner and a referrer... you’ve got a whole population to deal with... It’s a very difficult thing to struggle with, and even when you do...there are societal values about it, so all those things on the margins which are really expensive...are really difficult challenges.

However, many suggest that the situation is beginning to improve with the arrival of the National Institute for Clinical Excellence (NICE).

In my experience when decisions have had to be made, and you try to look at the cost-effectiveness side of it, it’s very unusual that we’ve got really robust data. I think we’re getting better at it, particularly with NICE being set up and so on, we are more and more aware of the need for good cost-effectiveness.

In comparison to access and equity - seen often as founding principles of the NHS, valued and promoted by most health service personnel - cost-effectiveness is seen often as a more recent consideration for decision-makers thinking about NHS service provision and distribution. Although the need to recognise resource implications of decisions about service provision is seen to have become more accepted and commonplace in recent years, resistance and reluctance amongst many health professionals to consider such issues is noted in previous decades.

I think people working in the NHS have a sort of notion...do value the concept of equity and access. I think cost-effectiveness is, maybe has not necessarily always been around, and understandably. I think it is
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more recent. I think people now can't ignore the fact that resources are finite and there has to be some sort of decision-making around where resources are best spent. But I think people, some people, struggle with that a bit more 4: 21

Also, it is often suggested that clinicians should not be overly concerned about cost when they are working with patients, and that calculations should ideally be left to health economists, with standards set and general allocation decisions made by commissioning groups and service managers.

Cost-effectiveness is largely the job of health economists to sort out. They give us information and method A versus method B. I don't think that's a thing for service people to do, but if you are running a service you undoubtedly have explicit quality standards for the service you are running. And those standards you relate to access and to various other variables. Safety and that sort of thing. 11:58

As mentioned above, while open, objective, comparative and detailed assessments of options are supported widely, most participants say that the vast majority of decisions are not made on the basis of rigorous analyses of cost-effectiveness. Although this is related partly to knowledge/information/time problems, it is also suggested that decisions are dictated centrally, for example in Department of Health policies, and implemented via funding arrangements tied into targets, national service protocols and guidelines (etc). Despite official rhetoric, and the recent development and general support for NICE, most study participants, and especially those working at meso and micro levels of NHS decision-making, see commissioning decisions as having very little to do with cost-effectiveness.

The other thing to observe in all of this is that we talk about commissioning as though it was a process starting with a blank sheet of paper. In fact, active commissioning decisions are only made for about 2% of our overall budget, maybe 5%, but a very small minority of the health service as a whole, or budget as a whole, is subject to active decision-making. Most of it just happens and goes on. So the screening programme goes on because it's always gone on. 7:22; 7:216

I'm not sure, well I must at some level make trade-offs between equity and access, or equity and cost effectiveness. The trouble is agendas are set from above and often you have to, I mean, the access we've had to do, and that's being worked on by everybody. I don't think that equity is [monitored] as much, so I suppose we have more control over that. Maybe that's why we do the community stuff in terms of
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equity. And there’s less with cost-effectiveness probably. I think there are always access issues... I don’t think I’m very good at thinking about all the things...and with pressure from above, [access] often takes precedence.

Int Do you think...you are in tune with PCT level or national decisions?...At your individual level... How does it compare with other levels, and to how it used to be?

I guess probably easier. You know, when you think about the NSFs then I think, generally it’s good stuff. It’s "How can we do it?" and to what level you can do it. I suppose I’ve always tried to foresee what’s going to happen and plan for it...There’s a lot more of that, it’s a lot more managed a service. 5:190

Several participants from all three levels of responsibility, suggest that although many people generally accept the principle of cost-effectiveness, it is rarely considered a priority by the public in decisions impacting on their own area/lives. The problematic influence of pressure groups on decisions is highlighted often.

You find huge amounts of effort going into trying to make a decision... And then... someone takes you to court, and you get a decision where you can’t stop providing [treatment x] even though it’s got very minimal effectiveness apparently. Suppose you were doing a new service, then certainly you would go for what’s cost-effective and you’d hope and pray there’s no single issue, public interest group out there waiting to ambush you... But say it’s a lethal disease and it hits young people...it’s very political... And then you’re into reviews which...take up huge amounts of time and effort... But you would go for cost-effectiveness ...and try to ensure...decent equity in terms of access...So the principle isn’t difficult...the practice is immensely difficult, because you’ve got to manage so many different interests ...And you still see huge variations in places...because, for example, there’s pressure from the public because they believe you are reducing access. 1:93

The issues and processes involved in the reduction or closing of established services are seen widely as very different to those involved in the setting up or expansion of services.

I was involved with ENT surgery in a little cottage hospital, forty miles from the nearest anaesthetist. So you’d get a general anaesthetist...doing children’s work...and then when they’ve gone home...you’ve got nursing support, but if something goes wrong...you’ve got 40 miles and got to find a helicopter. So it’s too
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dangerous. So you [close it] and move the services to where it's safe but you haven't got any access...and there's a huge political row...
1:188

It's much easier to start, or decide to start something, or not start something, than it is to decide to stop it, or remove it. Ask the Labour candidate for Kidderminster about reorganising local hospitals, as he or she waits in the dole queue. 2:228

A few participants refer to the increasingly debated issue of patient safety and its relationship to issues of cost-effectiveness, access and equity. Reduced patient safety - relating to lower clinical effectiveness connected to lower levels of expertise - and higher unit costs, are associated with disparate, community-based services, and contrasted with comparatively safer/cheaper centralised, specialist facilities. But several participants observe that the public is generally more often concerned about the negative impact of closures of local services on issues relating to access and/or equity rather than their effect on costs and effectiveness, and - often only theoretical - claims of reduced 'safety'.

Considerations of cost-effectiveness are weighed up in relation to the impact of decisions on various socio-political concerns and public acceptability.

You could do a cost-effectiveness analysis...say "the costs per life saved is £100,000" ...and we know that in other areas we don't invest where cost per QALY is £30,000 or £40,000. So it would make sense to dis-invest the breast screening and invest in whatever else. But of course politically that would be an absolute non-starter, it would just be unimaginable that we should dis-invest...on the grounds of cost per quality adjusted life year saved...But...what we can do is use those sorts of analysis at the margins. For example, we are being berated about our PCT's cervical screen coverage rates...we've got one or two practices where the...rate is only 70%...compared with others...in the high 80s. And we would like to bring them all up, but if you look at the ones with the low rate they tend to be practices with higher minority populations and it's those women...who tend not to access cervical screening for a whole variety of reasons ...Now if we approached this from the understanding that the marginal benefits from increasing the screening rate from 70% to 80%...will be relatively low in terms of numbers of lives saved, but the costs will be...much higher than the average cost for the population as a whole, then that may well temper our approach...But even then, the political side comes in as well, because it's obviously not politically correct to say we're not bothered about...the ethnic minority population, you just can't say that.
7:172

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The relationships between concepts

Several respondents mention a small number of recurring topics, issues and "terms" in relation to their understandings of all three concepts. For example, many respondents use the term "Need" when talking about their understandings of all three concepts, often mention the subject of 'availability' and actual amount or level of services being decided upon, and say repeatedly that central governments 'prioritise', set and implement policy 'agendas' in relation to their various and 'changing perspectives' on the relative importance of the three concepts. Access and cost-effectiveness are seen as complicated because they involve many components, and equity as difficult because it involves the exposure of feelings and beliefs involving notions of social justice and fairness, and about the origins/solutions of disadvantage and inequality. Cost-effectiveness is initially more often seen as involving relatively straightforward ideas, but very difficult to incorporate into practice for both operational and political reasons.

You find huge amounts of effort going into trying to make a decision...Suppose you were doing a new service, then certainly you'd go for what's cost-effective and you'd hope and pray there's no single issue, public interest group out there waiting to ambush you...But say it's a lethal disease and it hits young people...it's very political...The principle isn't difficult...the practice is immensely difficult, because you've got to manage so many different interests...there's pressure from the public because they believe you're reducing access. 1:93

Generally, the concepts appear difficult to discuss in isolation from each other, with access and equity especially hard to separate. For example, in relation to all three concepts virtually all respondents refer to the issues of 'availability' of services/interventions, and the amount, allocation and distribution of financial and non-financial 'resources'. Indeed, several respondents highlight that services actually being 'available' and 'resourced' are prerequisite to considerations of access, equity and cost-effectiveness. Only a few and specific terms are mentioned in comments relating to only one of the concepts, with "guidelines and protocols" being mentioned exclusively in discussions relating to cost-effectiveness, "barriers" only in discussions about access, and "expectations" only in discussions concerned with equity.

Several respondents recognise that different people have different views and understandings of the concepts and also that their explanation may be more or less detailed than that of others. Some link explicitly their knowledge and perspective on the concepts to their formal education, past and present employment and roles, and/or level and scope of responsibility in decision-making. Several respondents recognise that views about the importance of the
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concepts in NHS decision-making are also influenced by general and health-specific experiences, and their personal and political beliefs and values, involving moral and ethical standpoints. Some respondents recognise that different perspectives result in, or at least contribute towards, conflicting opinions about the relative importance of the concepts in decisions about NHS resource allocation, delivery and organisation, and the prioritisation and implementation of policies. Several describe how different governments, policy makers, NHS staff and managers, and members of the public/patients can/do support different decisions and interventions because they prioritise different goals, hold different beliefs and will be affected by particular decisions in different ways and to different extents.

Academics understand these...in a sophisticated, intellectual way...far removed from how you operationalise it...They’ve offered a very clear set of constructs and a clear framework for people to operate within, but [they] don’t have operational responsibility ...I think people on the ground ...service deliverers...probably have a fairly sophisticated idea of the complexity...but don’t have any clear vision about what they can do about it. I think there’s a learned helplessness out there... The group I don’t think have any real concept of this is the policy makers...they are completely disconnected from what this really all involves...And setting waiting list times is so much easier than talk about caring or listening or respect...I think at policy level they dare not open this box and have a look and see what’s inside.

10:116

Importantly for the later empirical work, several recognise that scarcity of resources results in decision-makers having to make "trade-offs" between services organised to improve access, equity or cost-effectiveness, as each arrangement incurs different 'costs' and produces different 'benefits', and that decisions reflect the 'relative priority' of each in relation to the other/s. A few discuss the process in softer terms, referring to the weighing up of relative merits of different options without mentioning that one gains at the expense of the others, even if all are considered.

If you put smoking cessation services in an area where people are very willing to give up, you’ll get more people giving up per clinic, than if you put it somewhere else. So your services will inevitably be more cost-effective. Now that maybe that you end up with an inequitable service and that’s where the trade-off emerges...Similarly with revascularisation, if you concentrate on the relatively well-off middle classes who are generally healthier, get out of hospital quicker, don’t have peri-operative complications, do all the right things, you’ll probably get a better throughput and more people operated on than if
you concentrate on the sicker end of the spectrum, people within poorer socio-economic groups and so on. So if you want to maximise cost-effectiveness, you may well end up having an inequitable service, and this is one of the fundamental criticisms of the whole QALY approach isn’t it? Because…maximising cost-effectiveness may well, will inevitably, tend towards undermining equity.

7:17

A range of perspectives

Because of the range of perspectives on and different opinions about the importance of working to achieve greater access, equity or cost-effectiveness, several respondents say they would prefer a more ‘open and accountable decision-making process’ with an explicit rationale. Some support more ‘public involvement’ in priority setting and decision-making more generally. Some suggest that greater ‘transparency’ or ‘participation’ has begun to develop, identifying examples of this in terms of good practice, and see it as a way to increase public awareness of the difficult ethical issues and complex dilemmas involved in decisions about resource allocation and service provision/distribution.

A few respondents suggest that by consulting with the public/special interest groups about their “preferences” and involving them, especially, in decisions that involve highly emotive issues, can reduce criticism about, and obstructive campaigns against, decisions. But many more respondents are cautious or overtly hostile about increasing consumer involvement in decision-making, with several describing specific examples of decisions being made more difficult, time-consuming and laborious because of pressure groups, local politics and self-interest, and aggravated by inflammatory media coverage. Such situations often involve the refusal of “lay” people to recognise “expert” scientific evidence regarding cost-effectiveness, and their claims of “rights” to access available interventions, regardless of their cost or effectiveness.

If you look round all these attempts to change services, one regular feature is "No we don’t want to lose our local hospital", which has often been there a hundred years...often raised by public subscription...People feel it’s theirs, and of course if it moves away...they feel that they don’t have the same access, and they don’t...Physically, if you’ve got a car it’s ok. If you have to go on the bus, if granny’s in hospital and it's 15 miles away, it’s almost impossible...It's also deep-rooted community issues...it’s sentiment...You can say "It's actually safer if they go to X" and the response often is "Well you say so, but we don’t believe you. This is about cost-containment, cutting back services, reducing access for local people". And of course the MP then has to get involved...So Directors of Public Health regularly have MPs ringing them, writing to them, requiring responses. It’s very political... 1:206
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Related to this, several respondents refer to the contrasting perspectives of academics, politicians and the “real worlds” of the NHS/patients’/pressure groups and the general public and their varying concerns and different priorities arising as a consequence. Some issues in and problems of decision-making are mentioned quite widely in relation solely to cost-effectiveness, and a few solely in connection with access. For example, different issues and concerns in decisions about “starting, extending and closing services” are highlighted exclusively in the early comments about what is involved in cost-effectiveness; and “accessibility” as it relates to the interconnected topics of “timeliness, waiting lists and speed through the system” is only mentioned in the early thoughts about access.

1.5 Discussion

Clear definitions of access, equity and cost-effectiveness are important if policy recommendations are to be implemented as they are intended. They are also important for the later parts of this project, where quantitative trade-offs between concepts will be asked about. Unfortunately, the reviews of the literature and the qualitative interviews have confirmed our initial suspicions that the terms access, equity and cost-effectiveness do not have very clear definitions. In the policy documents and in the interviews, each term appears to provide a kind of shorthand with each incorporating a recognised range of topics and issues. The respondents in the interviews describe their understanding of the terms as being complicated because of their various components, and most respondents seemed to find the terms difficult to talk about in isolation from each other. Describing and discussing access and equity separately appeared especially difficult, and there was considerable overlap about what the terms mean and/or involve.

There were some differences in the review and in the interviews between macro, meso and micro levels, with reductions in inequalities in health being more of a concern at the policy and resource allocation levels. At the individual clinical level, there appeared to be greater concern about access to, and the availability of, services. A key issue seems to be that the concepts are not being clearly communicated from the macro level to the meso and micro levels. If the concepts are not clear in the macro documents, it is difficult to see how policy can be operationalised at the micro levels.

The definitions and use of the terms may also change over time. For example, equity may have previously been understood as ‘health variations’ in previous decades. Access for a number of NHS staff still had connection to the previous use in relation to physical access to buildings for individuals with disabilities, although more pejorative language such as ‘fair access’ was often used. The interview respondents were also aware that the emphasis could also change reflecting the level of attention and importance within the health policy
**Relative importance of access, equity and cost-effectiveness**

agenda. In general, when looking at the use of the terminology and the analysis of the policy documents, interview respondents appear more likely to use definitions associated with the public health literature, where utilisation rates are used to represent concerns for both access and equity.

From the reading of the literature and considering the responses to the interviews, access will be measured in two ways: 1) the distance that people have to travel to utilise services (geographical access); and 2) how long they have to wait to use those services (temporal access). It is clear from the interviews that access and equity are often used to mean the same things, and so, to distinguish them clearly in later empirical work, equity is defined in relation to the effect of services on health. Equity in health will thus refer to the fair (but not necessarily equal) distribution of health benefits, which is broadly consistent with current usage of the term at the macro level (NICE, 2001). Cost-effectiveness was much clearer to respondents in the interviews, although there was less clarity about how to operationalise the concept.

It is worth noting that many of the interview respondents had problems providing specific examples or detail about the methods used for measuring the concepts, and most refer to the difficulties of obtaining useful measurements in the 'real world' of the busy NHS. However, it is important to provide trade-offs between the concepts in quantitative terms and we are confident that people will engage in trading off more benefits for improved access or equity. Insights were gained into what respondents might be thinking about when presented with trade-off questions, and this will help in the design of the survey stages of the project, and will aid in interpreting the results.
Section 2 Estimating how decision makers thing the concepts should be traded off against one another

2.1 The replication study

2.1.1 Introduction

In an earlier ESRC funded project entitled Measuring preferences regarding equity and variations in health (ESRC ref L128251050; the “ESRC study”, hereafter), a postal survey was used to look at the degree to which members of the general public are willing to sacrifice efficiency in order to reduce inequalities. In another project funded by the AHRB entitled “Concepts of procedural justice: from legal studies to social decision-making” (AHRB ref 13789; the “AHRB study”, hereafter), a series of group discussions were conducted, in which members of the public discussed issues of procedural justice in publicly funded health care. The main objective of this part of the study was to replicate some of the questions used in these two general population surveys in a postal survey of NHS staff to see the extent to which the general public and NHS staff share the same underlying preferences.

The second objective was to explore the effect of including a set of attitudinal questions on these responses. This turns out to be an important addition to the original study design. From social cognition models of behaviour, it is known that the views individuals hold are predictive of how they behave (Conner and Norman, 1996). However, there is little, if any, evidence describing the attitudes respondents have to questions concerning inequalities in health or procedural justice in health care. By exploring the attitudes that underpin preferences, it may be possible to explain why some preference questions produce more stable choices than others. It is likely that the greater the consistency between the attitudes expressed and the preference elicited, the more stable the preference. This will give greater confidence in the preferences being carried through into real-world decision-making.
2.1.2 Methods

The questionnaire

There were three versions of the questionnaire. The first version, which is reproduced in Appendix B, consisted of four sets of questions and some background questions (gender, age groups, clinical or managerial post, and whether respondents have private health insurance). The first set of questions was designed to assess respondents’ attitudes towards issues of equity and access in the health service. This questionnaire’s content was informed by the interview schedule of the earlier ESRC study and the Theory of Planned Behaviour (Ajzen, 1985), i.e. a top-down methodology. This social psychology theory provides a structure to explain how the views people hold are associated with their behaviour. In brief, whether or not an individual intends to behave in a certain way depends on a) his/her evaluations or attitude to the behaviour, b) his/her perception of how other people will judge their behaviour, and c) his/her perception of how easy or difficult it is to carry out that behaviour. The items in this first questionnaire were worded to assess these constructs in the context of equity and access in service provision. Fourteen items were included in the final questionnaire, each with a response that required the respondent to rate their agreement with the item on a five-point Likert scale.

The second set of questions was taken from the ESRC project and began by presenting the difference in life expectancy at birth between the highest and lowest social classes (78 for social class 1 and 73 for social class 5, each of them making up around 7% of the population). The question then asked for the respondent’s preference over two hypothetical programmes: one that increased the life expectancy of both social classes by 2 years, and another that left the life expectancy of social class 1 unchanged and increased the life expectancy of social class 5 by 4 years. If the respondent chose the first programme, no further questions were asked.

If the respondent chose the second programme – if they chose to “target” – then they were asked further questions where the first programme was unchanged but the second programme became increasingly less effective in four stages, so that at the last stage the choice was between the first programme that increased the life expectancy of both social classes by 2 years and the second programme that left the life expectancy of social class 1 unchanged and increased the life expectancy of social class 5 by 1.5 years. To prefer the second programme at this last stage suggests that the respondent thinks the inequality is so severe that reducing it takes priority over improving the absolute level of life expectancy of those in social class 5 (or in economics jargon, implies violation of monotonicity). The objective here was to note the stage at which the
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A respondent “switches” to preferring the first programme. For further details of this question design, see Shaw et al. (2001).

The third question was identical to this, but substituted the social classes with the sexes. Women have a life expectancy of 78 years at birth while men have a life expectancy of 73 years. In the same manner as above, the questionnaire explored whether or not the respondent preferred the targeting programme, and, if so, at which stage they would switch to the first programme. Whereas the postal questionnaire in the ESRC study did not include this question, the results from a series of interviews at an earlier stage of the project found that while more than half the respondents would target the disadvantaged group when the inequality was between the social classes, less than half would do so when the inequality was between the sexes.

The fourth question was taken from the AHRB study. It concerned the issue of who should be making resource allocation decisions. Respondents were asked to imagine that there was a committee with the remit to make such decisions, and to indicate what sort of people should make up this committee. They were given a list of candidates and instructed to select five members from them. The list consisted of: general public, patient groups, GPs, hospital doctors/consultants, nurses, health services managers, politicians, religious groups, legal representatives, philosophers/ethicists, health economists, and others.

The second version of the questionnaire was identical to the first version except that the question on inequalities in life expectancy by sex preceded the same question by social class. The purpose of this version was to test whether or not the ordering of questions would affect the answers. The third version of the questionnaire was identical to the first version except that the questions about attitudes towards issues of equity and access in the health service were dropped. The rationale for this was to examine the impact of attitudinal questions on the remaining questions. The table below summarises the three different versions of the questionnaire.
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<tr>
<th>version question</th>
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<td>(4)</td>
<td>who should be on the committee</td>
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<td>(5)</td>
<td>background characteristics</td>
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**Analysis**

Exploratory Factor Analysis was performed to identify underlying attitudinal factors employing a varimax rotation (Tabachnick and Fidell, 1989). Scores were calculated by adding together the items included within the factors. To aid interpretation, scores were pro-rated, i.e. the sum divided by the number of items included in a factor to provide a factor score between 1 and 5 (agree to disagree with 3 being a neutral figure). The total scores were then split into categorical responses of 'good', 'neutral' and 'bad'. Chi\(^2\) tests with a 5% significance level were carried out to explore differences in beliefs by age and sex. We did not have sufficient background information to look at whether beliefs differed by job type.

The results of the questions on inequalities in life expectancy by social class and by sex were tabulated for each version by the proportion of respondents who chose not to target (i.e. those who prefer the first programme from the very first stage) and who chose not to switch (i.e. those who prefer the second programme throughout). Those who chose to target and then subsequently to switch are referred to as those who trade-off (between efficiency and equality). The relationship between targeting or switching in the social class question and in the sex question (i.e. consistent targeting, or consistent non switching) was also tabulated.

A series of two sided z-tests were carried out, with a 5%-significance level, to test the following null hypotheses: 1) the preference for targeting, and for not switching, is not affected by whether the inequality is between social classes or between the sexes; 2) the ordering of the social class and sex questions does not affect the proportion of those who target and those who do not switch; 3) the presence or absence of the attitudinal questions has no effect on the proportion of those who target and those who do not switch in the social class and the sex question; and 4) the proportion of NHS staff
who target and who do not switch in the social class question is the same as the proportion found in members of the public.

Three additional analyses were carried out. First, the effect of respondent background characteristics on targeting preferences is tested. Second, consistent targeting and consistent non-switching across the two questions were explained in terms of the respondents’ background, by using binary logistic regressions. And third, further analysis was carried out to explore the relationship between the attitudinal questions and the choices made in the inequality in life expectancy questions.

The results of the fourth question, about who should be on a decision-making body, were tabulated in terms of the mean number of members of different categories in a committee of five, and compared to the preferences of the general public.

The sample

Using a specialist web site (Specialistinfo.com), contact details for 1,115 hospital specialists were extracted. This specialised database was broken down by region and presented the names in alphabetical order. Information was also included on gender and the year of first qualification i.e. MBChB. The year of qualification was taken as an assumption of approximate age. This made it possible for us to extract a sample of medical practitioners by age, gender, specialty and geographical location. Medical staff specialising in vascular, cardiac or respiratory medicine were excluded, as these specialists were to be targeted in the survey using discrete choice scenarios reported in 2.2.

Using Primary Care Trusts’ (PCT) websites to access General Practitioner (GP) lists, a random sample of 340 general practitioners were extracted by geographical location. The contact details for GPs were used to contact 320 practice nurses. An additional 25 persons were drawn from other hospital-based data, such as specialised nurses who were named. It proved impossible to extract the contact details for individual hospital ward-based nurses. Thus, 1,800 questionnaires were sent out: 585 to men, 600 to women, with the gender of the remaining 615 unknown because of lack of information regarding first names. The questionnaires had the logos of the University of Sheffield, the School of Health and Related Research, and the NHS SDO R&D Programme on the front page. A prize draw offered £100, £50, and £25 book tokens to three winners.

2.1.3 Results

The sample

The questionnaires were posted to the 1,800 addressees, and subsequently followed up by 1,200 reminders addressed to those who had not replied by the end of the third week, with spare copies of the
questionnaire enclosed. The prize draw was held a month after the initial mail out, at which point 675 questionnaires had been returned, resulting in a 38% response rate. This compares very favourably with the original ESRC study, which had a 28% response rate from the general public. The response rates were very similar across the three versions (37.7%, 38.2%, and 36.7%, respectively). Of the respondents, 62% were female, 68% were in the age range 40-54, 96% were clinically trained and in a clinical post, and 79% had no private health care insurance.

The attitudinal questions

Complete attitudinal data were available for 432 respondents who answered either version 1 or 2 of the questionnaire. There were no statistical differences in background characteristics between those completing and not completing the attitude questionnaire. The background characteristics of those with complete data for the attitudinal questions are not statistically significantly different from the whole sample.

The Exploratory Factor Analysis identified five factors, accounting for 68% of the variance after 6 iterations with the Eigenvalue set at 1.00 (see Table 2.1a). Most respondents agreed that the NHS should be a publicly funded resource for all (factor 2). Most felt they were in control of whether or not they would receive treatment by the NHS (factor 3). Opinion between respondents was less homogenous for the remaining factors but about half felt that NHS treatment should not be dependent on patients’ lifestyle choices (factor 1), the more privileged should pay more taxes or for more private services (factor 4), and those using the service more than average should pay more (factor 5).

In terms of demographic differences in attitudes towards equity in the NHS, differences were found by sex but not by age. Specifically, female respondents held stronger views that the NHS should be a publicly funded service for all than male respondents (factor 2), and male respondents were more likely to state an opinion that access to services should be related to amount of use than female respondents (factor 5).

These findings suggest that although respondents favour a publicly funded health service for all, they are in less agreement about how to address the issue of NHS funding. It seems as if more people would support differential costs based on class and amount of use rather than lifestyle choices but, in practice, these issues would be difficult to separate. Finally, these data provide some insight into why preferences are not always transformed into behaviour at point of delivery. A third of respondents expressed no opinion on differential access or costs for NHS services. Preference elicitation methods require respondents to choose between options and, when forced, those that are undecided do make a choice. However, if attitudes are unformed, the preferences that respondents express may be labile and
subject to change over short periods of time. This may make many policies unpopular at given times, thus impeding their successful implementation.

The inequalities in health questions

Table 2.2 summarises the distribution of responses for the question on inequalities in life expectancy by social class and by sex. As can be seen, over 50% of respondents choose not to target in either question, and, on the other hand, around 10% choose not to switch and choose programme B throughout the trade-off part of the exercise. Furthermore, slightly more people target in the social class question than in the sex question, but this is not significant ($p = 0.575$ for version 1; $p = 0.065$ for version 2; $p = 0.493$ for version 3), and there is a similar proportion of non-switchers across the two questions ($p = 0.518$; $p = 0.353$; $p = 0.338$ for the three versions respectively).

Question ordering does not appear to affect targeting (version 1 vs version 2: $p = 0.440$ for class; $p = 0.605$ for sex), nor non-switching ($p = 0.107$ for class; $p = 0.981$ for sex). Finally, attitudinal questions do not have a significant effect on targeting (version 1 vs version 3: $p = 0.317$ for class; $p = 0.392$ for sex), nor on non-switching ($p = 0.187$ for class; $p = 0.319$ for sex).

Across the three versions, 45% of respondents choose not to target in both inequalities in health questions and 7% choose to target in both questions. These proportions are not affected by question ordering or by the attitudinal questions. The attitudinal questions did not appear to affect targeting preferences: the only exception was that those favouring publicly funded health care were more likely to target in the social class question, as might be expected.

In relation to the effect of background characteristics, it appears that men are less likely to target than women. Focusing only on those with a clinical training (to partially control for the effect of job type), in the social class question, 64% of men and 49% of women did not target; in the sex question, 66% of men and 56% of women did not target (both are significant differences at the 5% level).

The original ESRC funded study found that in the question on inequality in life expectancy by social class 42% chose not to target, and 10% chose not to switch. Thus, it can be said that NHS staff and members of the public have statistically significantly different targeting preferences ($p = 0.003$), with the public being more likely to target, although they are not significantly different with respect to non-switching behaviour ($p = 0.656$).

The ‘who should be making decisions’ question

The first three columns of Table 2.3 summarise the distribution of preferred committee members from this study. Since the committee was to have five places, the figures in each column add up to 500%. The questionnaire version has little effect except for: “patient reps”
and “others” between versions 1 and 2 (p = 0.038 and p = 0.034 respectively); and “patient reps” between versions 1 and 3 (p = 0.008). According to the respondents of versions 1 and 2, the committee of five will consist of: a member of the public, a GP, a hospital doctor, a nurse, and a health economist. Respondents of version 3 will have a patient rep instead of the nurse.

The last column of Table 2.3 presents the results of the original AHRB general population study. Pooling across the three versions, NHS staff (column 4) and members of the public (column 5) have statistically significantly different preferences on having “GPs”, “hospital doctors” and “others” on the committee (p < 0.000, p = 0.010, and p < 0.000 respectively). Whereas the committee of five supported by NHS staff has a member of the public, a GP, a hospital doctor, a nurse, and a health economist; the general public will vote in a patient rep, a GP, and a hospital doctor for the first three places, and then have a member of the public, a nurse, a health services manager and a health economist tied in fourth place.

2.2 The discrete choice experiment study

2.2.1 Introduction

The replication study provided useful insights into the way decision-makers view the trade-off between maximising health and reducing inequalities in health, and suggested that they are more concerned about the former than are members of the general public. However, it did not tell us anything about the relative weights attached to cost-effectiveness, equity and access when all three objectives are considered simultaneously. This part of the project involved the development of a discrete choice experiment (DCE), formerly referred to as conjoint analysis, which presented respondents with choices involving different levels of different dimensions of policy concern.

DCEs are increasingly being used to elicit people’s preferences in health care, including the preferences of service providers in relation to priority-setting (Ryan and Farrar, 2000), and a study looking at how vascular patients traded off such attributes as local access to services and clinical outcomes (Shackley et al, 2001). The DCE approach was also recommended to the UK Treasury for valuing the quality in the provision of public services (Cave et al, 1994). DCE is a complex technique that places a relatively high cognitive burden on the respondent. It also involves making a number of quite stringent assumptions about how levels and attributes interact with one another (Bryan and Dolan, 2004). However, previous studies have shown good reliability and validity when DCE is applied in a health context (Ratcliffe and Longworth, 2002; Bryan et al, 2000).

In a DCE study, respondents are typically faced with pairwise choices between hypothetical scenarios that are designed to reflect the
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different attributes that real world decisions would contain. Respondents are asked to choose their preferred scenario from each pair. These preferences can then be used to infer the trade-offs that they are willing to make with respect to changes in the levels of the attributes. This approach has been used to examine how health care professionals (NHS managers, clinicians and nurses) would make trade-offs between attributes relating to access, equity and cost-effectiveness in the provision of specialist treatment for a cardio-vascular disease.

2.2.2 Methods

Attitudinal questions

Prior to the qualitative interviews as part of Aim One of this project, there was little, if any, published data describing professionals’ views towards cost-effectiveness, equity and access within the NHS. One of the findings from the interviews reported in 1.3 was that respondents were aware of, and had some general notions about, the concepts of cost-effectiveness, equity and access. However, what was also evident was that respondents had varied views about these concepts and many were unclear about their operationalisation in ‘real-world’ contexts. Further, when trying to define the attributes of each concept, the boundaries between them were, at best, fuzzy and, at worst, indistinct.

There is concern that the choices made in these hypothetical situations do not accurately reflect the decisions that the respondents would make in real world settings. In an attempt to improve the quality of the information derived from the DCE, the hypothetical choice scenarios were preceded with a set of attitudinal questions containing statements obtained from the interviews carried out as part of Aim 1 of this study. The aims of the attitude questionnaire were to describe the range of values professionals have towards cost-effectiveness, equity and access and act as an aid to completing the DCE task. The attitude questions may encourage respondents to focus on their views towards the attributes associated with the concepts. As noted in the previous section, within behavioural decision research, there is evidence that encouraging individuals to undertake this type of explicit evaluation is associated with the making of more robust choices; the attitudes elicited are less labile (Chaiken, 1980) and the choices made are more informed (Bekker et al 2003).

In its standard form, DCE does little to encourage respondents to employ systematic information processing strategies when making trade-offs. Respondents are therefore more likely to rely on heuristics to make the choice rather than weighing up the pros and cons of the attributes associated with each decision option. As with the replication study, encouraging respondents to focus on their evaluations of attributes associated with cost-effectiveness, equity and access before
undertaking the hypothetical trade-offs may enhance the robustness of these techniques to elicit preferences for service choices.

Each transcript from the interviews was assessed for complete statements about cost-effectiveness, equity and access, but particular attention was given to statements provided by respondents in response to questions about definitions, measures and real-world examples of each concept. All the statements extracted from each of the transcripts were listed in a separate file, together with a seven-point Likert response scale ranging from 0 (strongly disagree) to 6 (strongly agree). The individual statements were sent to the research team who were asked to circle the number that corresponded with their views about the statement. In addition, the team were asked to identify statements that made no sense to them as a stand-alone statement. In total, 25 statements were identified through this process as items assessing professionals’ views towards cost-effectiveness, equity and access. The statements are reproduced in Appendix B1 together with the full DCE questionnaire.

**DCE attributes and levels**

The attributes and their levels were chosen by the research team based upon the policy questions the study wanted health professionals to address, and were informed by the results from the qualitative interviews. In order to simplify the concept of cost-effectiveness, costs were assumed to be identical between the two programmes in each pairwise choice but effectiveness was allowed to vary between programmes. This was expressed in terms of quality adjusted life years (QALYs), which is presently the most common metric for expressing the benefits from health care programmes in the context of informing resource allocation decisions (NICE, 2004). Equity was defined in terms of the share of health benefits received by the highest and lowest income quintiles of the population. Data from the interviews suggested that access should be defined in two key ways: time spent waiting for treatment (temporal access) and distance travelled to receive treatment (geographical access).

The DCE approach requires that the chosen attribute levels should be realistic and credible to respondents and, crucially, that respondents are capable of making trade-offs across them (Ratcliffe, 2000). Total health benefit from each programme (QALYs) had levels 20, 30 and 40; the share of health benefits (SHARE) was either 20% to both highest and lowest quintiles (SHARE = 0), or 30% to the worst off quintile and 10% to the best off quintile (SHARE = 1). The three middle quintiles always received 20%). The average waiting time to receive specialist treatment (WAIT) was either two months or eight months and the average distance travelled to hospital to receive treatment (DISTANCE) was either five miles or 30 miles. All variables but SHARE were entered as continuous variables. SHARE is a categorical variable but has an identical effect to including two
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variables for the upper and lower group shares and restricting that their coefficients have equal magnitude and opposite sign.

A computer programme developed by Huber and Zwerina (1996) and run in SAS (SAS Institute, 2000) was used to obtain an optimal statistical design for the DCE, which reduces the possible combinations of attributes and their respective levels (or scenarios) to a manageable number for the purposes of a questionnaire while retaining maximum statistical efficiency for the estimation of model parameters. The programme produced eight pairwise choices for comparison. For each pair of scenarios respondents were asked to indicate which they would choose when asked to consider different ways of providing specialist treatment for a cardio-vascular disease (see Appendix B2).

Initial piloting

It was important that the scenarios made sense, and that there were no glaring problems with the selection process, and so a convenience sample of clinicians and an administrator from our local Hospital Trust were contacted and invited to take part in a pilot of the main study. The research team, either through previous contact or through friends, knew most of the respondents to the pilot study. Respondents were asked to complete the questionnaire and to ‘think aloud’. Where time constraints did not allow this, respondents were asked to provide their feedback verbally.

The sample of nine hospital consultants was mainly from anaesthesia with a special interest in cardio-vascular work or intensive care and one hospital administrator. Four participated twice by completing early and final versions of the questionnaire. It was interesting to note that only the administrator was fully comfortable using the terms. She explained to the researcher that many of the documents that passed over her desk used these terms frequently and she had familiarised herself with their meaning. After the first two interviews, changes were made to the wording.

After five interviews, one of the tasks was omitted. This task had asked respondents to match actual policy to what they understood to be happening in the clinical areas. Respondents were asked to state what they thought was actually taking place and what they thought should be taking place. Clinicians, in keeping with the results of the qualitative initial interview study, were not always up to date with the latest government policy. This made the task too complicated and off putting, as well as doubling the number of choices required. The feedback and revision process, particularly dropping the questions about what respondents thought policy was doing, made it more likely that the final version would be understood and completed by the target sample.

As part of additional qualitative work, respondents were asked about the size of population they were considering when making their choices in the DCE study. There was a strong suggestion from meso
and micro levels that “their patients” formed the population group under consideration. This included the group served by a PCT or those seen within a speciality. The average number of patients served by a PCT is approximately 250,000 but the hospital specialists obviously considered much smaller populations. Overall, the population average was 60,000.

**Sample selection**

The sample of health professionals was drawn from the macro, meso and micro levels. At the macro level, senior officials in the Department of Health, NICE directors, senior persons from the Welsh Assembly, directors of the National Service Frameworks, and senior Directors of Public Health were all sampled (n=68). At the meso level, a database was compiled through the NHS web pages listing the members of the boards of the Strategic Health Authorities (SHAs) and Primary Care Trusts (PCTs). All 28 Chief Executives in SHAs, 298 chief executives in PCTs in England and 23 individuals who had titles such as head of resources or director of commissioning within PCTs were sampled. The micro level was represented by all 1039 clinicians active in the UK in the specialties of cardiac disease, cardio-vascular surgery, vascular surgery and respiratory medicine whose contact details were provided by a specialist web company. This gave a total possible sample of 1456 individuals.

**Questionnaire variants**

Three versions of the main questionnaire were produced. Version one (n=766) comprised the attitudinal questions, the DCE questions, background characteristics, and a question asking whether the respondent was interested in taking part in a follow-up interview. Version two (n=340) did not contain the attitudinal questions but the remainder of the questionnaire was identical to version one. Version three (n=340) was identical to version one, except that the order of presentation of the DCE attributes was reversed i.e. total distribution of QALYs was the first item and distance travelled was now the last item. The questionnaires were distributed randomly throughout the sample using random number allocations in Excel.

**Analysis**

In analysing the 25 statements that made up the attitudes questionnaire, frequency data were used to illustrate the range of views professionals held about individual items relating to cost-effectiveness, equity and access. Factor analysis was used to identify patterns of responses. Chi-square tests were used to examine any differences in choices according to whether attitude questions were asked. Analysis of variance was used to explore differences in attitudes by demographic variables age, sex and job type, and to explore the association between views about cost-effectiveness, equity and access and the choices made.
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The data from the DCE exercise were analysed using the random effects probit model, which takes account of the repeated measurement aspect of the data, whereby multiple responses are obtained from the same individual (Propper, 1995). The function to be estimated was of the following form:

$$V = \beta_1 QALY + \beta_2 SHARE + \beta_3 WAIT + \beta_4 DISTANCE + e + u$$

where $V$ is the utility or satisfaction associated with each programme, $\beta_1$ to $\beta_4$ are the parameter estimates of the model and $e$ and $u$ are the unobservable error terms, where $e$ is due to differences amongst observations and $u$ is the error term due to differences amongst respondents. The estimated coefficients and their statistical significance (or otherwise) indicate the relevant importance of the different attributes on individual preferences.

A positive sign on a coefficient indicates that as the level of the attribute increases the utility derived increases (and conversely for a negative sign). The marginal rate of substitution (MRS) provides an indication of the extent to which respondents are, on average, prepared to trade an improvement in one attribute for a detriment in another attribute. The MRS between a pair of attributes can be estimated by the ratio of the relevant parameter estimates, and a non-parametric bootstrapping approach can be used to generate confidence intervals around MRS of interest (Briggs et al, 1997).

To ascertain the extent to which preferences vary across respondent subgroups, the data were segmented according to: age group (39 or younger, 40-54, 55 or older); gender; clinically trained and in clinical post versus non-clinically trained and/or in non-clinical post; and hospital clinician versus PCT or SHA/DoH. This was provided that the subgroups had more than 30 observations, which is the minimum number recommended for analysis (Louviere et al, 2000). Dummy variable interaction terms were then created between all of the attributes and a dummy variable for each characteristic. Where there were more than two levels for a particular characteristic, one level was used as a base case and all subsequent levels were compared to the base case. The Wald statistic was used to test for statistically significant differences on the coefficients across sub-groups.

For each respondent, tests were also carried out to determine if any of the attributes were dominant; that is, whether the scenario with the higher level of a given attribute is always chosen, irrespective of the levels of the remaining attributes (Drakopoulos, 1994). Chi² tests were used to test whether the attitudinal questions would reduce the incidence of dominant preferences, both for the distribution of dominance in general and by attribute in particular.
2.2.3 Results

Sample

A total of 380 questionnaires were returned after one reminder, which represents a 26% response rate. There were no significant differences across the three versions, with response rates of 27%, 26% and 24%, respectively. This is less than for the replication study, but still broadly comparable to the response rates for postal surveys of the general population (Harrison and Cock, 2004; Hoffman et al 1998). The characteristics of respondents are shown in Table 2.4, from which it can be seen that the majority of respondents were male (70%) and aged between 40 to 54 years (71%). Hospital clinicians made up nearly two-thirds of the sample, and most were from England.

Attitudinal questions

There were 288 useable responses to the attitude questionnaires. Table 2.5 shows the frequency of responses to the 25 items by the ten extracted factors, which account for 63% of the variance. The factors suggest that respondents view current policies as necessary to maintain an efficient health service (factor 1; factor 3; factor 6; factor 8; factor 10) but are sceptical of how the policies are implemented and understood by both patients and professionals (factor 2; factor 5, factor 7; factor 9). Additionally, they are unsure of their usefulness in long-term service provision (factor 4). Interestingly, the distribution of responses by item seems to indicate that there is more homogeneity in views around conceptual issues, for example the role of the NHS, than about how to turn policy into practice, which lends support to the findings from the qualitative interview study.

Although there were no differences in views by age, there were by sex and job type: men and clinicians in clinical positions were less supportive of current policies and more sceptical of their implementation than women and non-clinicians or clinicians in management.

DCE results

Overall, 40.3% of respondents exhibited dominant preferences for one of the attributes: 28.6% were in relation to total health benefit and 10% were in relation to waiting time. It was noted that fewer respondents who completed the attitudinal questions employed a dominance strategy (38% as compared to 47% who did not complete the attitudinal questions), a difference that only trends towards significance ($\chi^2 = 2.1; \text{d.f.} = 1; p=0.09$). There does not appear to be any obvious patterns in which attribute is more likely to be dominant in the absence of the attitude questions.
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The results of the random effects probit model for the total sample (excluding 10 respondents with missing data) and for those with non-dominant preferences are shown in Table 2.6. For the total sample, all the regression coefficients have the expected signs and are statistically significant, indicating that, overall, respondents prefer health care programmes that bring about greater benefits, reduce inequalities, have shorter waiting times and shorter distances to travel for treatment (Table 2.6a). The results when those with dominant preferences are excluded are broadly similar (Table 2.6b).

Consider a programme providing the middle level of total health benefit (30 QALYs) that increases the health of all groups equally (SHARE=0). Here, the five quintiles receive six additional QALYs each. The size of the coefficients for SHARE (0.1241) and QALY (0.0514) suggest that targeting the worst off (SHARE=1) is preferred to providing an additional QALY in total health benefit. In order to have the same effect as improving equity, a programme increasing total health benefit would have to provide 2.41 (0.1241/0.0514) additional QALYs on top of the original benefit of 30 QALYs. Therefore, the following programmes are equally valued: give 6.48 QALYs to each quintile (32.41 QALYs in total); give the lowest quintile 9 QALYs, the highest quintile 3 QALYs, and the intermediate three quintiles 6 QALYs each (30 QALYs in total).

In relation to waiting time, a one month reduction in waiting time (coefficient 0.0755) in a programme is valued more highly than a one QALY improvement in health benefits (0.0514). In order to have the same effect as a one month reduction in waiting time, the total health benefit of the programme would have to increase by 1.47 QALYs (0.0755/0.0514). In a similar way, a one QALY improvement in total health benefits has the same effect as a reduction of 5.84 miles in the average distance to a hospital (0.0514/0.0088).

The results from the segmentation of respondents according to background characteristics indicated that there were no statistically significant differences in preferences across age groups. However, female respondents exhibited a stronger preference than males for targeting the worse off (Wald test, $P<0.001$), those who were clinically trained and currently in a clinical post had a stronger preference for programmes with shorter waiting times compared to those in a managerial or non clinical posts who favoured equity more, and hospital clinicians were less likely than PCT, SHA or DoH staff to favour programmes that target the worst off (Wald test, $P<0.001$ in each case).
2.3 Follow-up interviews

2.3.1 Introduction
The aim of the follow up interviews was to gain insights into the respondents’ thought process associated with the completion of the DCE survey reported in Section 2.2. This was achieved by approaching a small number of respondents from the DCE survey for a follow-up study, where respondents were asked to go through the same questionnaire and to explore the choices they made. The original DCE questionnaire included, at the end, a specific question about taking part in a follow-up interview, and 136 respondents (36%) indicated a willingness to take part.

2.3.2 Methods
The initial aim was to interview up to 20 individuals, and a mix of macro, meso and micro level decision makers were selected, and the sample was to include those who had dominant preferences and those who did not. Sixty letters of invitation were sent out to individuals in batches of 20. These enclosed a blank copy of the questionnaire that each respondent had filled in for the original DCE survey. The invitation letters were followed by phone calls to organise an interview. It became apparent early in the process that a number of individuals had moved on. This was particularly the case of those at PCT level, such that about one in five individuals were no longer in the same post less than six months after the original survey.

The number of contacts between the researcher and the potential respondents to arrange convenient times to carry out the interviews was about five. Arrangements were often cancelled indefinitely at this point. Although it was envisaged that a number of interviews would be face-to-face, this became increasingly difficult to organise as interviews were cancelled at short notice. Thus, in the end, all the interviews were conducted by telephone. In the period from February to June 2005, 14 people were interviewed. Ten of these were clinicians, two from PCTs, one from SHA and one from National level. There were three women and eleven men.

The aim of the follow-up was not to ask respondents to recall the choices they made in the original DCE survey, but to ask them to go through the questions again, in an interview setting. Most respondents, nevertheless, thought that their follow up choices were fairly consistent with their previous choices. The questions put to respondents were informed by the results of the DCE study. There was particular interest in whether the levels within the scenarios had affected the choices and would individuals have been more inclined to change their choices had the levels been more or less extreme. Thus,
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the first part of the interview was very structured, and respondents were asked the following questions:

- Physical distance/travel/location/convenient
- Did the number of months to wait influence their choices?
- If the waiting time had been different, would it have influenced their choices?
- Did the number of miles to travel for treatment influence their choices?
- If the distance had been different, would it have influenced their choices?
- Were the levels in the scenario above or below government targets in these areas?
- Did the number of QALYs allocated to the programme influence their choices?
- If the QALYs had been different, would it have influenced their choices?
- Did the distribution of benefits influence their choices?
- If the distributions had been different, would it have influenced their choices?
- When making their choices between programme A or programme B, how many patients did they envisage being affected by changing the waiting time or distance travelled, or the number of QALYs?

A ‘think aloud’ technique was used to allow the respondent to explore in more depth the choices they made and why they made them (Ryan and Farrer 2000; Offredy and Meerabeau 2005). This is a complex technique developed by Ericsson and Simon (1984) in the field of cognitive psychology. It has been used extensively and now increasingly adapted for use in health care research (Boren and Ramey 2000; Neilsen et al 2002). Respondents were encouraged to think about the choices they made and verbalise the processes they went through when reaching their decision. Interviews lasted between 12 minutes and 55 minutes, depending largely on how comfortable respondents felt about thinking out loud. All the interviews were tape recorded, transcribed verbatim and prepared for analysis.

The data were analysed using an approach developed by Ritchie and Spencer (1994), and described in Section 1.3.1. The integral part played by the earlier interviews in the development of the DCE format and the direction of the present work provided a strong structure for the developing themes. Once the initial coding was complete ATLAS.ti (1997) was used to assist with data management.

It was unsurprising that given the comprehensive early work and the similarity of the interviews that the coding across the two studies was
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quite similar. The ‘a priori’ codes used to describe access, equity and cost effectiveness were:

- Physical distance/travel/location/convenient
- Waiting times/lists/timeliness of use
- Availability/provision of service/close a service
- Specialist services/centres vs general/district/local hospital
- Targeted interventions
- Values – value judgements/ethics
- Central agenda/policy makers
- Political pressure
- Resources/funding/cost/investment
- Pressure groups/public choices
- Preventative/health promotion
- Use in relation to need
- Best off/least well off/wealth/better off

There was limited opportunity for other themes to emerge from this data, but what was new was the description of how clinical innovation has impacted on waiting times in some specialties. Also, clinicians described private practice or their non-participation in private practice, and how the best-off group have more opportunity to seek out private health care. These were coded as

- Innovations in practice/organisation
- Private practice/access/well off

2.3.3 Results

Geographical access

In general, the levels presented in the scenarios found some resonance with the interviewees and there was some general agreement about the levels reflecting the real world situation. Most commented that the levels would have had to be very different for them to have changed their choices. Importantly, the location of the interviewee was a major determinant of their perspective on travel. Those in a more rural location were used to sending their patients to specialist centres and were not so concerned about the distance travelled. Similarly, those who were located in larger units used to treating patients who had travelled often some considerable distance to obtain treatment were less worried about the distance travelled.

Look at the choice here. My decision was very much it is worth waiting 8 months to double the QALYs and travel 30 miles. You know it’s an argument we have every day here...do you go to the .... hospital 6
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*miles down the road that mismanages patients all the time.. or do you go to see the best person?* 6:52

However, there were those who did not go with the general consensus on travelling for treatment.

*My experience with my patients is that they hate travelling for anything so that is a big issue for me. There has to be a huge alternative gain to persuade me to make people go 30 miles to get it.* 3:13

Interestingly, someone at the macro level used similar language, but the conclusion was quite different.

*..probably the distance travelled would have needed to be very different between the two choices to make any difference.* 5:10

Another view at the meso level when asked whether the levels of the distance attribute within the DCE scenarios had influenced their choice had this to say:

*No not that sort of thing no. I don’t think necessarily in mileage terms I think knowing my local situation...how easy is it to get to from A to B. You see it’s far too simplistic to think in mileage terms. What you have to go back to is the good old fashioned Black Report. Which is can an individual who doesn’t have transport get from A to B. Now A to B might be a mile or it might be 2 miles or 5 miles or 30 miles..but the fact of the matter is if ...you’re dependent on public transport and it takes... and there is no direct transport access link between where you live and where you’ve got to go to. Then it doesn’t actually matter how far...* 10:64

Some other interviewees indicated that choices had been made which traded off distance travelled with QALYs gained but there was still sympathy expressed about the difficulties patients experienced in getting to hospital and having visitors once undergoing treatment. This was most often seen as being outweighed by a better outcome.

**Temporal access**

Most interviewees had the view that waiting time, or temporal access, was beyond their control and they were constrained by policy. It was generally considered to be less important if you believed that the
patient’s condition would not deteriorate during the wait. Clinicians on the whole found this difficult to do and have a tendency to question this assumption. However, it was apparent that some were able to suspend their disbelief and accept that, given that it was stated that the patient would not suffer from a longer wait, it became less relevant.

*It comes down more to waiting time over distance travelled and I came down on the 2 months waiting time rather than 8 months on the basis that if you are getting more QALYs then you are benefiting sooner 6 months half a year sooner.*

This aspect of getting the QALYs sooner did come up with other interviewees and this was elaborated on in terms of the risks to the patient from their own behaviour which would go on longer and cause more damage to their health.

*...so the other interesting one....so if the times were closer together... so it was 2 months and 6 months. Then in fact I'd probably made a different decision...and I'd have made the decision on the benefits to the.. the bigger benefits to the worst off group....on the basis that they do much worst on particularly on cardio-vascular disease and so their risk is greater and they are unlikely to take into account the risk factors.. you know reduce their own risk factors.*

One interviewee was concerned that something which could deliver a fairer, higher health gain may not be permissible under the new waiting times. Similar concerns were expressed by a macro level interviewee who was not so impressed about the waiting times being cut further and was more interested in the level of health gain.

*Even if it was an unrealistic waiting time...If the benefits of waiting that were vast i.e. you would get loads more health gain and you would have had to wait a bit longer for it then it would have been quite a difficult choice....*

A meso level respondent expressed the following view about waiting times when explaining the choices in the DCE.

*...actually I think the waiting time is a complete red herring because we have national targets for waiting times that we have to achieve.*


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**Equity or share of health benefit**

An interesting finding from these interviews which was also borne out in the DCE analysis that those closer to the decision making process, for example at the meso as compared to the micro level, were more inclined to choose a distribution of the health gain in favour of the least well off in the scenarios presented.

*In all things other than the share of the health benefit it looks like programme A is a better choice. In a sense I’m sort of putting those three factors and weighing that that is better than the worst group getting a better benefit but less total health benefit across the whole group.*

Another interviewee expressed the view that the other benefits would have to be of a greater magnitude to outweigh the benefit of distributing the health gain towards the less well off group. Those closer to the patient, like this clinician, expressed this differently.

*To me the wealth of the patient shouldn’t really be an issue in their access to medical care. So everyone should have access to medical care irrespective of wealth I think. So it wouldn’t be an issue for me.*

The previous qualitative work had shown that some respondents found it difficult to separate out equity from access and that access was more important at the micro level. There was a strong feeling that, as a clinician, this respondent should treat the individual patient in the clinic or bedside and did not consider the wider picture.

Another (clinician) in working through the questionnaire aloud made the following statement:

*Do you sacrifice QALYs to ensure social balance ensuring that the worst off group gain more.. I came down in favour of programme A there because if you look at it you know you are halving the number of QALYs so even if 30% ..so even if three quarters of those QALYs you’re still only 15 QALYs to your worst off group... whereas in the other one you are getting 20 QALYs. Ok your best off group do better but I thought that was...ok.*
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This interviewee held slightly conflicting views about the issue of equity:

But it depends on whether you feel that the National Health Service’s role is to redress the inherent imbalances of the human condition and socially engineer or is it to provide maximum service to maximum number of people. 7:63

Later in the interview they justified making a choice that was contrary to a previous choice in saying:

You have to think that if the best off group do worse in some of the choices they do have access to alternative sources of health care. 7:87

Another alternative view was expressed about the interventions in the scenarios presented in the DCE questionnaire. The introduction to the questionnaire stated that respondents should consider the choice to be between specialist cardio-vascular services, and thus this interviewee had given some thought to the commissioning of specialist services. There were some thoughts expressed which questioned whether specialist services were always the most appropriate service for the least well off. The interviewee considered that resourcing chronic health management systems in primary care might target the least well off. The following example was given to help explain this reasoning.

So their [the PCT] use of specialist services hasn’t given them any really great health improvement. They’ve concentrated on the part of the system that is going to give them the most health improvement for the most needy in the population. So you might say that that shared health benefit for this particular intervention [in the DCE exercise] might not be that big an issue for health inequalities because you’re dealing with it in a different way. 10:305

It is an interesting view in that equity and share of the health benefits is a key component of this respondent’s thinking but he also appears to express the view that the best off may have the capacity to benefit more from specialist interventions. This is taken to mean that the choice they were being asked to make was too abstracted from the real world choices to the extent that they were not able to engage with the process; although they did complete the original exercise. This was not a view expressed by other interviewees but the conflation of concepts still may have been a problem for other respondents.
Cost Effectiveness

Generally, interviewees were comfortable with the concept and were prepared to choose QALYs gained over other outcome possibilities. However, not everyone was familiar with how QALYs are calculated and this gave rise to some difficulties, illustrated in this quote.

The thing I think about with the QALY if we are talking about cardiovascular disease in an elderly group although it may not be to you but it is in my practice... If for an individual the QALY gain is 20 then that is a 20 year gain of quality life for one individual if these patients are already elderly then I regard 20 as great. If it is only a difference of 3 or 4 then that is not so great even if they are in their 60s and 70s. Whereas a 25 year gain is significant equally you've got to be careful not to make it too big a difference because the sort of people I look after...are in their 70s and if you are going to suggest that I could make them live to 100 then that is nonsense. But if you have explained that each person...it is divided up between and each get only 2 or 3 then that would be different....but I interpreted it as 20 quality life years per patient. 3:89

One of the difficulties in doing surveys is to provide clear meaningful information about the attributes and levels, while still being concise, and the balance struck may not have been optimal for all respondents.

Other interviewees were more familiar with QALYs in their work and research undertakings and were much more in favour of these being used than in other measures like morbidity or mortality. However, the exception to this was an interviewee from meso level who found QALYs unhelpful in their planning, implementation and evaluation of health programmes.

I don’t like them. I have to say and we don’t use them here... Because whilst I recognise that they are a measure of health benefit they are not something we like to use here at all. We think they are too simplistic 10:210

2.4 The pairwise comparison (PC) study

2.4.1 Introduction

One major concern regarding DCEs is that it is not always easy for respondents to take into account all the attributes presented in the
choice questions and to engage in trade-offs across all of them without relying on simplifying strategies and heuristics or, as evidenced by some of the comments from the follow-up interviews, by not treating all attributes as independent of one another. The DCE questionnaire used in this project consisted of four attributes (health gain, distribution of the gain, length of wait, and distance travelled) with two or three levels in each. The regression analysis produced statistically significant coefficients with the expected signs. However, the relative size of the coefficients, and the MRS between given pairs of attributes, may not be particularly robust.

A follow-up postal questionnaire was designed in order to gain additional insight into the reliability of the regression results. One alternative considered was Best-Worst Scaling (BWS) (Flynn, et al 2005). This is a relatively new method that allows the interpretation of the regression results in terms of absolute, as opposed to marginal, utility. Instead of choosing between two scenarios that are constructed from a set of attributes, respondents are asked to deal with one scenario at a time, and to indicate which are the best and the worst attributes about the given scenario.

However, while BWS provides a potentially useful extension of the DCE methodology, it was felt that several factors made it inappropriate for use here. First, we would need about 600 respondents (Louviere, personal communication) because BWS attempts to derive more parameters from simpler data. Second, if we assume that zero equals zero utility, then it is possible for a scale with a “natural” zero (such as the number of QALYs gained, waiting time, and travel distance) to have a positive or negative sign in utility terms. Where more than two factors have natural zeros (as here), at least one coefficient is likely to be positively or negatively valued at “zero” because it does not appear to be possible to rescale coefficients to avoid this. Finally, when a small pilot was carried out on health services researchers, a design where some attributes are positive (40 QALYs is better than 30 QALYs) and others negative (an eight-month wait is worse than a two-month wait) was found to be very confusing.

In the end, it was decided to present respondents with a series of pairwise choices as in the DCE but to have only two attributes in each scenario, thus reducing the complexity of the task. For consistency, the same levels of each attribute were used as in the original DCE study.

### 2.4.2 Methods

**Questionnaire**

Follow-up questionnaires were sent by post to those who responded to the original DCE study. Each questionnaire was coded to facilitate within-respondent comparisons between the two postal surveys. The follow-up questionnaire started with the set of attitudinal questions...
used in the original conjoint postal survey, to explore the test-retest reliability of these questions. There was only one variant, and thus all respondents received the attitudinal questions. The PC part of the questionnaire consisted of a series of pairwise choices between two programmes, where each programme was described in terms of just two attributes. Of the four attributes used in the conjoint study, health gain (which has three levels) was used as the reference against which the three other attributes (which have two levels each) were assessed. The full questionnaire is reproduced in Appendix B3.

**Analysis**

The reliability of the attitude questionnaire was explored by correlating the factor scores produced in the DCE and PC studies. The same factor structure developed at time one was applied to the attitude items at time two. Chi-square tests were used to test the effect of attitudes on responses to the PC questions.

In order to provide maximum compatibility between the DCE and PC results, the DCE regression is re-run only for those providing follow-up data. Again, the estimated function was of the form:

\[ V = \beta_1\text{QALY} + \beta_2\text{SHARE} + \beta_3\text{WAIT} + \beta_4\text{DISTANCE} + e + u, \]

where \( V \) is the utility or satisfaction associated with each programme, \( \beta_1 \) to \( \beta_4 \) are the parameter estimates of the model and \( e \) and \( u \) are the unobservable error terms, where \( e \) is due to differences amongst observations and \( u \) is the error term due to differences amongst respondents. Note that one model was used to model all attribute pairs together. As before, positive coefficients suggest that an increase in that variable is desirable, negative coefficients that it is undesirable.

The equation for \( V \) is used to predict whether a person will select the left or the right hand option in a DCE experiment. The values for \( \beta_1 \) to \( \beta_4 \) are not, in themselves, interesting except in that they allow us to calculate estimates for the marginal rates of substitution (MRS) between all four attributes in the DCE. For example, \( \beta_1/\beta_4 \) is the estimate for the trade-off between additional average distance (miles) and health gain (QALYs). We are interested in whether the MRS differs between the DCE and PC questions. In order to examine this, we need to incorporate uncertainty into the MRS values.

For the DCE results, we form a distribution for the MRS between health gain (\( \beta_1 \)) and the other parameters (\( \beta_2 \) to \( \beta_4 \)). We take the DCE distributions for all four parameters and randomly sample using Microsoft Excel to find new parameter values (\( \beta_1^* \) to \( \beta_4^* \)). The sampled MRS values (\( \beta_1^*/\beta_2^* \), \( \beta_1^*/\beta_3^* \), and \( \beta_1^*/\beta_4^* \)) are then stored separately.

By repeating this process, we can build up a distribution for the underlying MRS within the DCE results.
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The PC asks the respondent to select one of two options and, depending on the choice made, allows us to infer whether her MRS is above or below a specific value. If we assume that the DCE and PC results are similar, then we can estimate (from the DCE results) the probability that a person will select an option in the PC choice. By comparing the inferred (DCE) and actual (PC) proportion selecting the higher QALY option (using t tests for differences in mean probability), we can detect any significant differences the inferred and actual values. Any such difference would suggest that the DCE and PC results differ.

The PC responses are also analysed using a random effects probit model in a similar way to a standard DCE regression. Note that this regression is not a standard DCE as the questions do not include all dimensions. In the original DCE dataset, those individuals whose responses implied that one attribute might be dominant were identified; responses were compared between those which were dominant for each attribute and those which were not. PC responses were also compared between the two questions provided on each attribute. All statistical tests were conducted in either SPSS or STATA, at a 5% 2-sided significance level.

2.4.3 Results

The sample

The questionnaire was sent to 348 respondents of the original conjoint postal survey, with an offer of entry to a prize draw. After one reminder, 171 completed replies were returned resulting in a 49% response rate (plus 9 uncompleted questionnaires).

Attitudinal questions

In total, 135 respondents completed attitude items at both time points. The test-retest correlations showed good reliability (p<0.01) for eight of the ten factors. The exceptions were factors 5 (uncertainty about policy prioritising) and 8 (purpose of the NHS).

Trade-offs between cost-effectiveness, equity and access

Table 2.7 presents the numbers of respondents selecting each scenario. Respondents are more likely to choose the high-QALY option in the choice involving 20 or 30 QALYs, than in the choice involving 30 and 40 QALYs. This difference is significant in the QALY-WAIT (t= -4.695, df=167, p=0.000) and QALY-SHARE comparisons (t= 2.953, df=165, p=0.004) but not in the QALY-DISTANCE comparison (t= 1.743, df=167, p=0.083). The replication of DCE results for the follow-up group (n=122 complete responses) is given in Table 2.8. The coefficients are very similar in all cases barring that of SHARE (where the coefficient falls by approximately 25%), but significance at the 5% level is unchanged in all cases.
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It is common for DCE studies to estimate the marginal rates of substitution (MRS) between attribute pairs. The MRS is estimated by the ratio of the relevant attribute parameters from the estimated regression model. This statistic provides an indication of the extent to which the group of respondents are prepared to trade an improvement in one attribute for a detriment in another. The MRS is commonly presented in the form of point estimates alone. However, given that the MRS is based upon a ratio of two estimated parameters with associated variance, it is important that the variance around the MRS is also estimated.

The distribution of MRS was estimated using sample sizes of 50,000 at a time, where convergence is established across five samples with a RMSE of at most 0.002 for the probability falling in all 32 ranges considered. These ranges are displayed in Figure 1 (see pages 89-90), which presents MRS distributions for the QALY-SHARE, QALY-DISTANCE, and QALY-WAIT trade-offs based on all 250,000 random samplings of the conjoint coefficient values.

In the PC questions comparing health and waiting time, 10 QALYs are traded off against a reduction of six months in waiting time. For those selecting the option with more access and fewer QALYs, each month of waiting time must be worth at least 1.67 QALYs. Correspondingly, those choosing the QALY benefit implicitly weight QALYs above this threshold. Within the 250,000 random drawings producing DCE MRS figures, no observations were found that valued each month of waiting at more than 1.67 QALYs. As such, the DCE results suggest that all individuals should choose the high QALY option. In the PC, only 62% of individuals chose the high QALY option and this proportion is significantly different from 100%. A similar story holds for the QALYs and geographical access trade-off scenario. Here, the PC compares 10 QALYs with 25 additional miles and the DCE results suggest that 100% of individuals should choose the high QALY option. In the PC, the higher QALY option was selected by 86% of individuals and this proportion is significantly different from 100%.

In the PC questions comparing health and equity, for those selecting the option with more equity and lower health, each QALY can be worth at most 1/10 of more equitable benefit. Correspondingly, those choosing the QALY benefit (with less equity) implicitly weight QALYs more than this value. Within the conjoint MRS distribution, 99.1% of individuals are expected to value QALYs this highly. In fact, 78% of individuals in the follow-up study selected the higher QALY option, and these percentages are significantly different from one another.

Of the 171 individuals providing follow-up data, 71 had exhibited dominant preferences in the DCE study. Of these, 53 had preferences dominated by health and 16 had preferences dominated by waiting time. In all six PC questions, those having previously exhibited health-dominant preferences were more likely to choose the higher QALY option. However, in only three of six questions (both temporal access
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questions and one geographical question) were these differences significant, and there was very little difference between the responses of those exhibiting health-dominant preferences and all others in both the equity-based questions. In the two questions using the waiting time attribute, those previously exhibiting time-dominant preferences were less likely to choose the high wait, higher QALY option (56% vs. 70%; 44% vs. 56%). Neither comparison was significant, although this may be partly due to the low sample size available here.

Overall, the trade-offs from the PC questions can be found in a similar way to the conjoint study using a random effects probit model. The results of this model are given in the third column of Table 2.8. It is noticeable that there are three major differences in the coefficients from the DCE study. First, waiting time has become insignificant, suggesting that it is not important. Second, the size of the equity coefficient (SHARE) is much larger, suggesting a greater weight on equity versus cost-effectiveness than suggested in the DCE data. Third, the constant term is now negative and significant, which may be due to the unbalanced design (more QALY-maximising choices appear on the right hand side than on the left).

The MRS between the share of health gain and total health benefits suggest that a programme targeting the worst off is valued as highly as one giving 8.3 more QALYs. The MRS between QALYs and distance suggests that each QALY improvement in total health benefit is valued as highly as a reduction of 18.3 miles in average travelling distance to hospital. There is no MRS between QALYs and waiting time, as such, as the coefficient on waiting times suggest that longer waiting times are preferred, even if not significantly so.
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Figure 1 MRS for QALYs versus temporal access, geographical access and equity

Figure 1a MRS distribution for health versus access (waiting)

Figure 1b MRS distribution for health versus access (distance)
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Figure 1c  MRS distribution for health versus equity
2.5 Discussion

The replication study reported in Section 2.1 consisted of a postal survey of NHS staff, principally to explore their views on inequalities in health. The results of the attitudinal questions show that respondents endorse the view that the UK should have a publicly funded NHS with equal access for all. However, there is less consensus about how best to allocate resources within the NHS, and some concerns about accessing resources when they are needed. Since this is the first study that we are aware of that has applied social psychology to understand professionals’ views about policy, it is not possible to say anything about how these results might compare to other studies in other contexts.

When asked to choose between targeting and not targeting resources to those with lower life expectancy at birth (i.e. the lowest social class and men), the majority (53%) chose not to target. The result in relation to social class is in contrast to the findings from a general population study in which the majority (58%) of respondents chose to target. The results would not appear to be explained by the fact that the sample of NHS staff was a better-educated sample: if anything, the better-educated respondents in the general population sample were more, rather than less, likely to target the lowest social class.

The greater propensity of NHS staff to choose the option which benefits both the highest and lowest social class may reflect the fact that the sample of NHS staff are more concerned with ensuring that health care resources are used to the benefit of all groups, including the better off. This in turn could be explained by NHS staff taking into account the possible political fall-out of devoting resources only for the benefit of the worse off e.g. the better off may become less willing to subsidise public health which could erode the support for the NHS.

Another possibility is that more NHS staff doubted the plausibility of the highly stylised scenarios, which led them to appear as if they were less concerned about targeting the worse off. For example, more NHS staff may have thought that, while it is technically possible to improve the life expectancy of all population groups by two years, it is far more difficult to do so for the disadvantaged group by four years. This may have resulted in the non-targeted option being chosen simply because it is more likely and not because of an underlying preference on the part of NHS staff. It was not possible to differentiate between those possible explanations from the existing qualitative work. Without further qualitative data, which was not feasible to elicit during this project due to the timing of the different stages, it is impossible to distinguish between these and other possible explanations.

With regard to who should be on a committee for health care resource allocation, the NHS staff sample and the general public sample agree on having a GP and a hospital doctor, but they disagree on having a
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patient representative and a health services manager. The less favourable view of patient representatives on the part of NHS staff bears out the results of the earlier qualitative interviews.

These findings will partly reflect the fact that the two study samples have very different perceptions of patient representatives and health service managers, and therefore have different attitudes towards them. While some NHS staff will deal with patient representatives quite often, most members of the public will probably not know of any patient representative or health services manager, let alone have the experience of working with them. It may be said that, in some ways, NHS staff are more knowledgeable but also more biased by vested interests associated with their job, whereas members of the public are less knowledgeable but maybe less biased.

Within these data there is also evidence to suggest that respondents’ own experiences and/or roles are associated with holding a different set of views. Attitudes differed by demographic characteristics: men and clinicians in clinical positions were less supportive of current policies and more sceptical of their implementation than women and non-clinicians or clinicians in management. These attitudinal differences by workforce characteristics suggest policy recommendations are likely to be received and implemented differentially across the NHS. Further, these data suggest that policy working groups need to ensure their membership is sufficiently heterogeneous if they want recommendations a) to reflect the views of those required to implement recommendations and/or b) to be aware of the barriers and facilitators to the success of any recommendations in practice.

The results of the DCE reported in 2.2 confirm that many respondents are prepared to trade between attributes relating to cost-effectiveness, equity and access. There is some suggestion of differences across levels of decision-making with clinicians at the individual level being more concerned about access and less concerned about equity than decision-makers at the meso and macro levels. However, a more striking finding is that over one-quarter of respondents exhibited dominant preferences for the total health benefit. This finding is in broad agreement with the findings from the attitude questions, whereby 75% of respondents indicated that they agreed with the statement that ‘cost-effectiveness calculations are essential when allocating current service resources’ and 66% disagreed with the statement that ‘cost-effectiveness calculations are not useful for long-term service planning’.

It is possible that the pattern observed of a fairly large percentage of respondents displaying dominant choices is a consequence of the choices presented. Alternative levels for some or all of the attributes may have encouraged these respondents to trade-off the dominant attributes. However, it is important to ensure that the levels chosen for the attributes appear plausible to respondents and the attribute
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levels included within this exercise were carefully chosen to reflect realistic levels for cost-effectiveness, access and equity indicators within the UK NHS.

Dominant preferences have been found in other DCE studies in health care (see Bryan and Dolan, 2004), and so although it is of borderline significance it is encouraging for future research that respondents completing the attitude questionnaire prior to the DCE were less likely to have dominant preferences. It seems likely that encouraging respondents to attend explicitly to views about cost-effectiveness, equity and access was associated with the employment of more systematic strategies when making the service choice, and this resulted in an increased willingness to make trade-offs between attributes. These findings are similar to those within the decision aid literature (Bekker et al, 2003) and suggest that choices made following systematic evaluations might be more robust over time than those made using simpler processing strategies such as dominance of attributes (Chaiken 1980). They are also important considerations for the design of Aim Four.

Of interest is how the DCE results in 2.2 compare with the replication study in 2.1. Leaving aside access, which is an attribute not addressed in the replication study, the respondents to the DCE questionnaire were willing to trade-off between cost-effectiveness and equity, whereas the majority of the respondents to the replication study chose not to improve equity even when it involved no sacrifice in total health gain. The results are consistent with what would be expected if a large proportion of respondents wanted to reduce variation in health but also did not want the best-off group to receive no health benefits at all, so this discrepancy might reflect the different ways in which equity was presented in the two studies. This is consistent with the findings from the follow up study as individual clinicians were likely to express views reflecting the patient as an individual and not as a member of a group.

The follow-up telephone interviews produced a number of useful observations on the thinking processes that informed the DCE responses. Respondents were, for the most part, comfortable with the use of QALYs to inform the decision making process. However, there was evidence that some of the respondents understanding of QALYs was quite poor and that these misunderstandings were influencing the choices they made. Respondents considered equity to be important but they were not necessarily consistent in the weight they attached to equity between choices.

Access, measured in terms of waiting time, was also important to all the interviewees but for different reasons. However, the respondents generally viewed this as being centrally determined and therefore not something that could be ‘traded’ in the real world. When they did trade, they would prefer shorter waiting times; which they justified in terms of expediting the QALY gain. Access measured in terms of
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distance travelled was important to some respondents but not to others. Respondents who had frequent contact with patients and who travelled to access health care consistently gave less weight to the increased mileage. Thus, specialists at referral centres and rural centres regard travelling a normal part of accessing health care and do not give much weight to it. In contrast, professionals whose patients did not have to travel far or who cared for an older population viewed substantial travelling as something to be avoided and were willing to trade health gain in order to do so.

In terms of the PC questions reported in 2.4, the test-retest correlations between the attitude questions showed good reliability (p<0.01) for eight of the ten factors. The exceptions were factors 5 and 8. The factors showing instability over time were both made up of single items: issues of equity are morally more important than issues of access (factor 5); it is the role of the NHS to ensure patients have access to services when they need them (factor 8). As both factors were made up of single items, it is likely that they were conceptually different from the other items within the questionnaire. We suggest these two items be removed from the questionnaire in future use or, if included, interpreted with caution. As with the DCE study, there were no significant differences by whether the attitudinal questions were completed first.

The finding in the DCE study that most respondents are willing to trade off cost-effectiveness, equity and access is strengthened by the results from the PC study, in which the trade-off is more explicit where only two attributes of the problem differ. However, the results from the DCE do not predict the PC results particularly well. The coefficients from the DCE suggest that each question should be answered in a particular way if responses are to be consistent, yet significant variation exists in the answers, and so the responses generally differ between the DCE and PC studies, despite being carried out on the same respondents. Having said that, those who exhibited dominant preferences first time around (and usually in relation to health gain), were more likely to exhibit dominant preferences second time around too.

Importantly, though, the trade-offs from the PC study may be less useful than those in the DCE study for policy purposes. While it is possible to find trade-offs between total health and equity, and total health and average distance, there is no reasonable MRS between QALYs and waiting time. As such, the results suggest that waiting times are not important. Given this, the DCE results rather than the PC results are possibly more useful for policy but the trade-offs should be treated with caution.
Section 3 Estimating implicit trade-offs

3.1 Introduction

Many interventions that aim to promote access or to improve equity will also be cost-effective but situations may also arise where trade-offs may occur. Rarely are these trade-offs made explicit, let alone quantified. Three case studies were used to estimate the implied trade-off between the concepts of cost-effectiveness and geographical access, temporal access and equity, defined in terms of narrowing the gap between the health of those in low and high socio-economic groups. These are the centralisation of vascular surgery, reducing waiting times for varicose vein surgery, and the provision of smoking cessation services in Health Action Zones (HAZs), respectively.

Two of these case study decisions related to access made at the ‘meso’ level of local service organisation and delivery: centralisation of vascular surgery and a waiting list initiative for varicose vein surgery. The third case study (smoking cessation services) appeared to provide an opportunity to consider data about decisions made at all three levels: the relationship between ‘micro’ decisions about individual treatment choices and socioeconomic status, the ‘meso’ policy of encouraging services to target more deprived populations, and the ‘macro’ policy to provide services initially only in HAZs.

The choice of case studies from those listed in the original proposal was largely based on the availability of data. As anticipated, database searches for economic evaluations in the potential case study areas confirmed the lack of appropriate published data. The principles of the methods and the key findings of the individual case studies are described in Sections 3.2-3.4. Section 3.5 provides some overall conclusions. The case studies are summarised in Table 3.1 (see Data tables, pages 134-148).

3.2 Centralisation of vascular services

3.2.1 Background

Increasing centralisation of health services is a current issue for a number of surgical specialties. Vascular surgery has recently emerged as a sub-speciality of general surgery and, with this increasing sub-specialisation, many general surgeons without vascular interests have become concerned with their ability to treat some vascular cases (VSSGBI, 2001). Sub-specialisation, and the existence of volume-outcome effects in a variety of specific surgical procedures (Dudley et al, 2000; Halm et al, 2002; Birkmeyer et al 2002), suggests that
outcomes will be better in those areas where workload is concentrated towards specific hospitals and appropriate clinicians (even after adjustment for case-mix). As patients generally express preferences for more local services, there is a trade-off associated with the increased centralisation of services between the distances that patients (and their families) have to travel and the cost-effectiveness of a service.

This trade-off considers a series of reorganisations in the North Trent region around the time of publication of an HTA report into vascular services in the area (Michaels et al 2000). Shortly before publication, vascular services (excepting varicose vein surgery) were rearranged so that services in Barnsley and Rotherham were administered through the Sheffield unit. Following the report, most Worksop services were reallocated to Doncaster, whereas earlier they had been provided by Sheffield. A “hub and spoke” model ensured that, while surgery took place in Sheffield and Doncaster, outpatient clinics and investigative procedures typically remained in the local hospitals where possible, thus maximising the improvement in outcomes.

Figure 2 (next page) shows the approximate locations of the major population centres and the additional distances required when travelling to Sheffield or Doncaster (as appropriate). These distances are calculated using the AA route map for distances between the main railway station in each area and the hospitals concerned e.g. extra distance of a transfer from Barnsley to Sheffield is the distance between Barnsley station and the Northern General Hospital (Sheffield) and the distance between Barnsley station and Barnsley District Hospital. These distances are then used to calculate the difference in travel resulting from reorganisation.

Where practice differs between centres, reorganisation might be expected to change the way activity occurs and so to affect outcomes. Even where practice is similar between areas, surgeons or hospitals with greater exposure to certain conditions or procedures may be expected to develop improved expertise. Where there is a positive volume-outcome effect, centralisation will tend to improve health outcomes regardless of any differences in the way treatment is delivered. This would also tend to suggest that centralised services would be more cost-effective than devolved ones. However, centralised services also, by definition, require patients to travel further for treatment than devolved services. Any move to centralise services will thus involve a worsening of geographical access. The degree of centralisation in the actual service reconfiguration has an implicit trade-off between cost-effectiveness and access within service reorganisation.
Local commissioners and providers made a collective decision to centralise several aspects of the vascular services. This was expected to involve increased travel for some categories of patient with the likely benefit of improved health outcomes, and possibly some cost consequences. The implicit decision, therefore, is that the value of the health benefits outweighs the value of the extra travel time and any additional costs. Mathematically, if the additional health gain benefits to the population concerned are $\Delta Q$ and the value of a QALY is $\lambda Q$, while the cost consequences are $\Delta C$, and the total additional patient travelled miles is $\Delta M$, then the value of the travelled miles (which we denote $\lambda M$) when traded off against health gains and costs can be estimated, since:

$$\lambda Q * \Delta Q > \Delta C + \lambda M * \Delta M$$

i.e. the decision to centralise implies that the value of the health gain outweighs the value of the extra travel and any extra NHS costs. Rearranging this equation gives:

$$\lambda M < (\lambda Q * \Delta Q - \Delta C) / \Delta M$$

i.e. the decision implies that the value of a patient mile travel must be less than the expression on the right hand side.
The decision to centralise vascular services is used to estimate the QALYs gained, the cost consequences and the expected additional patient miles travelled. This allows the implied maximum level for the value of access ($\lambda_M$) when traded off against cost and effectiveness to be estimated.

### 3.2.2 Methods

The basis of the model was the data used for the relevant HTA report on costs and outcome implications of the reorganisation of vascular services in North Trent (Michaels *et al* 2000), supplemented by local information on surgical activity and related travel after reorganisation. The HTA model uses case-mix groupings to categorise workload into a tractable number of areas. The HTA report included a review of the literature to establish whether a positive volume-outcome relationship exists in any area. Aortic and carotid surgery were identified as being the most likely types of procedures to have a volume-outcome relationship, since these procedures are complex and have a high risk of serious adverse outcomes.

The HTA literature review concluded that despite some evidence for volume-outcome effects, the evidence was not conclusive (Michaels *et al* 2000). Local mortality data, however, reveals that some volume-outcome effects appeared to exist for aortic surgery within the North Trent region. The HTA report argued that centralisation in two other clinical areas could affect outcomes. Firstly, changing the management of peripheral vascular disease could decrease amputation rates across the region. Secondly, by increasing the number of carotid endarterectomies performed, the number of strokes could be decreased. The methods used to estimate outcome changes and additional travel required is outlined below. Activity rates in all other areas are taken from the HTA base case scenario. All relevant operations in the three clinical areas are assumed to take place in Sheffield, while it is assumed that all other activity takes place through Sheffield (except for Doncaster, which also operates as a central unit).

**Modelling cost and effectiveness from centralised aortic surgery**

The primary activity measures for aortic surgery are taken from health episode statistics (HES) of the number of finished consultant episodes (FCEs) within each health care resource group (HRG) category. HES data (2000 or 2002) records yearly activity above 5 per 100,000 (for positive activity below this figure, activity of 2.5 per 100,000 is assumed.) The HTA report argues that existing HRG categories are a poor measure of activity as 26% of those assigned an emergency classification by the HTA team were not offered a vascular intervention that would place them within the HRG vascular groups (Q01 or Q02). As we do not have access to patient records of the type the HTA team
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used to categorise patients into elective and emergency groupings, HRG classifications (HES data, 2000) must be used to obtain estimates for the number of elective and non-elective consultant episodes within the North Trent region. As such, actual activity rates, and hence the benefit of reorganisation, may be underestimated.

Within the HTA-reported health statistics, the rate of mortality for local Sheffield patients was lower than that for local patients treated elsewhere. Patients referred to Sheffield had a higher mortality than did local patients where their referral was elective but a lower mortality if they were an emergency referral. The HTA report suggests that this is because elective referral will typically pick up the most complex cases, while emergency cases are likely to select the lower risk patients who are more likely to be transferred.

Given these confounding factors, it is inappropriate to treat these mortality differences as due to practice per se: the mortality figures from surrounding districts distinguish between those who were (and were not) transferred to Sheffield. The Sheffield figures include both those who would and would not have been transferred to Sheffield had they been from another location. It is assumed that those in the latter group will have the same mortality as those who were transferred from non-Sheffield locations. It is further assumed that the proportion of “transfer” and “non-transfer” cases is the same in both Sheffield and elsewhere. This allows us to estimate the mortality for “non-transfer” cases in Sheffield, which can be compared to the “non-transfer” mortality for non-Sheffield locations. Any transfer of “non-transfer” patients is expected to lower mortality. Note that “transfer” and “non-transfer” here refer to practices prior to the HTA report.

After reorganisation, formal arrangements determine that the Sheffield central unit should receive all patients – both the “transfer” and “non-transfer” cases above. The analysis assumes that all patients are transferred, with a sensitivity test including a scenario in which 10% of patients are treated locally (except Worksop, where all patients are automatically transferred). Given differences in expected mortality, this allows the number of lives saved to be calculated.

Published evidence was used to place health utility values on these estimates. Bosch et al (2002) used a Markov model to estimate the cost-effectiveness of surgical repair (70 year old, male cohort) for those with an abdominal aortic aneurysm between 5cm and 6cm in diameter. Removing the effects of 3% mortality during and immediately after surgery, the QALY estimate following successful surgery is 6.95 QALYs. This figure is used to provide a QALY value for all avoided deaths. Bosch et al use 3% discounting to produce this figure, and these figures are adopted

Reduced mortality requires that individuals spend longer in hospital. HES figures for 1995-2001 suggest that surviving aortic patients who are admitted as emergency cases spend an additional 25 days in hospital relative to those who die. For elective cases, this figure is 7
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days. Additional length of stay was estimated from HES figures for
1995-2001 and costed using estimates of unit costs within the HTA
report adjusted for inflation using the NHS pay and prices index (now
HCHS).

The unit costs used within Michaels et al (2000) are £195 per admitted
day, plus an additional £1,155 per day in Intensive Care Unit (ITU)
and £449 per day in High Dependency Units (HDU). Emergency cases
on average spent 55% of their time on normal wards, and were
assumed to spend 38% as ITU patients and 7% as HDU patients.
Elective patients typically spend 69% of their time on normal wards,
and are expected to spend 50% of the remaining time in ITU and HDU.
Given the figures above for additional length of stay, each additional
surviving non-elective and elective patient incurs a cost of £16,823
and £2,756 in 1998 figures, respectively. These figures are then
adjusted for inflation using the NHS pay and prices index (1997-98 vs.

Modelling cost and effectiveness from increased carotid
endarterectomies

The HTA report found evidence for a volume-outcome effect in carotid
endarterectomies at a physician and hospital (mortality) level but
none that adjusts for case-mix. While there was no evidence of a
strong volume-outcome effect for this procedure, the HTA identified
that for every six symptomatic patients treated for carotid
endarterectomy, there will be one fewer stroke in the next three years.
It was suggested that while the rates of carotid endarterectomy
differed between locations, there would still be a significant number of
potential beneficiaries from increased activity. Rates of carotid
endarterectomies fall within HRG Q05, which also includes upper limb
surgery. Assuming that 79% of Q05 cases are carotid
endarterectomies (Michaels et al, 2000), HES estimates for HRG Q05
FCEs are used to estimate the number of strokes avoided.

Jones et al (2004) cite a mean EQ-5D utility of 0.612 following stroke
(a mix of disabled and non-disabled stroke states). Using the EQ-5D
valuation tariff (Dolan, 1997) and the measurement and valuation of
health dataset, the mean EQ-5D of those above 60 years of age is
0.763, so that each (undiscounted year) of avoided stroke provides
approximately 0.15 QALYs. Discounting at 3.5%, correcting for
mortality from the age of 60 using UK 2000 mortality figures (Table
6.1, Health Statistics Quarterly), and weighting by the numbers of
men and women at 60, will give 10.2 QALYs to those not suffering
stroke, compared to 8.1, 8.2 and 8.4 QALYs for those suffering strokes
in years 1, 2, and 3. Overall, each stroke averted is expected to save
approximately 1.9 QALYs. The cost of both carotid endarterectomies
and avoided strokes are estimated using HTA model estimates.
Modelling cost and effectiveness following changes in the management of peripheral vascular disease (PVD)

Using local data, Michaels et al (2000) suggested an inverse relationship between vascular reconstruction and subsequent amputation for those with peripheral vascular disease. Here, treatments of claudicants for patients with critical ischaemia may result in an alteration of mortality, amputations, or the proportion of patients left with symptoms. The emergency PVD/major amputation groups are thus considered together in the HTA model. In all non-baseline scenarios, the HTA report assumed a centralised case-mix, and referral rates were assumed to follow either local or central figures depending on the scenario.

The HTA report identifies a number of different outcomes in the treatment of PVD, such as amputation, symptomatic vascular disease, and mortality. Michaels et al (2000) created a decision analytic model in order to assess the role of angioplasty in PVD treatment. They found that for non-salvageable limbs, the highest expected QALY figures were obtained with a below-knee amputation rather than conservative management or amputation above the knee. For those with a salvageable limb, the treatment option providing most QALYs was angioplasty, followed by surgery and then amputation. For mild claudication, the highest QALY option was conservative treatment (leaving a patient within an untreated health state), while angioplasty provides most QALYs for severe claudication.

As the appropriate treatment (in QALY terms) for ischemia/claudication cases depends on the severity of the problem, it is not possible to estimate the implications of reorganisation without an indication of overall case-mix and actual changes in treatment. Given that neither of these pieces of information can be inferred from the HTA report, such changes can only be considered using the rate of amputations observed. Specialising vascular services has been argued to reduce the number of amputations (Michaels et al, 1994). The rate of amputations is provided as HRG Q15, and it is assumed that the reduction in amputations between the years 2000 and 2002 within North Trent is due to changes in PVD management. In order to estimate the number of QALYs gained from any decrease in the frequency of amputation, the HTA-derived figure for the potential benefit of avoiding surgery (and using angioplasty in its place) of 1.8 QALYs per amputation is used.

As a sensitivity test, the case where only 50% of the decrease is attributable to centralisation is also computed. Within the HRG classification, the rate of amputations is measured using Q15. The cost of an amputation is estimated at £5,690 using 2000 HRG unit costs weighted by the number of elective and non-elective FCEs. As Michaels et al (2000) estimate that the likelihood of amputation given angioplasty is 0.335, 1.5 angioplasties are required in order to have a single avoided amputation. They estimate the cost of angioplasties as
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£2,650-2,922 for emergency cases and £949-995 for elective cases. Taking the midpoint of these ranges, and assuming that 85% of cases are elective, the HTA estimates suggest a unit cost per angioplasty of £1,251 (£1,360 in 1999/2000 prices). The net cost of each reduced amputation is thus £3,650 (£5,690-[1.5×£1,360]) for a benefit of 1.8 QALYs.

Modelling changes in travel distances

The effect of reorganisation is calculated using the AA route map as above. In order to estimate the travelling distance required following reorganisation, the base case estimate from the HTA report was used, modified by using new carotid, amputation and aortic rates. For other casemix groups, HES data is used to estimate activity (2000 data pre-reorganisation, 2002 post-reorganisation). The hub and spoke model post-HTA report sees all in-patient activity taking place in Sheffield or Doncaster (barring varicose veins, which retain the base case transfer rates) and 85% (expert estimate) of all outpatient activity being provided at spoke centres – such as Worksop, Barnsley etc. All activity from Worksop is transferred from Sheffield to Doncaster, while Sheffield performs operations for all the other centres. The only transfers of interest, therefore, are those to Sheffield from each of the other centres, and from Worksop to Doncaster.

3.2.3 Results

The HTA base case model saw 28.6% of non-elective aortic cases from non-Sheffield districts treated in Sheffield (supra-renal abdominal aortic aneurism (AAA) and aortic – emergency codes). These cases had a mortality of 25.0% and it is reasonable to assume that a similar percentage of Sheffield-based “transferable” cases would have the same mortality. Of the 21.86 deaths expected in Sheffield in the baseline HTA model, the “transferable” cases account for 4.63 deaths (at 33.8% mortality). This leaves a mortality of 37.3% (17.23 in 46.2 FCEs) in a Sheffield-treated group similar to those (33.6 FCEs) who were treated at local centres and who suffered a mortality of 59.4%. Given activity levels in HES data, it is expected that prevented excess mortality is 22.1% of the 56.4 FCEs additional cases, or 12.5 deaths.

In the elective aortic category, the HTA model saw 25.3% of external cases transferred centrally with a mortality of 5.3%. Using the same method as above, the mortality rate is 2.8% in a Sheffield-treated group similar in severity to non-transferred cases treated elsewhere (actual mortality 10.5%). This suggests an excess mortality of 7.7% of 153.8 locally treated cases, or 11.8 lives, which would be avoided given reorganisation. Overall, reorganisation is expected to prevent 24.3 deaths and gain 169 QALYs, at an increased cost of approximately £263,000 in 2000 prices.

If carotid endarterectomies constitute 79% of HRG Q05 cases (159 in 2000, 190 in 2002), then this suggests an additional 24.5 operations
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per year and four averted strokes within the next three years. In cost terms, the additional operations and reduced strokes will save the NHS £49,000 and produce 7.8 QALYs. The health episode statistics suggest that 578 amputations were required in 2000, as against 545 in 2002 (holding the population constant). If this is taken to be the result of vascular reorganisation, then these figures suggest that 33 amputations were prevented (requiring an additional 49.5 angioplasties). The net cost impact of the changes is a saving of £120,000 for a benefit of 60 QALYs.

Overall, the net effect of centralisation in cost-effectiveness terms is an increased cost of £93,000 per year in return for a QALY benefit of 236 QALYs. The incremental cost-effectiveness ratio of centralisation is therefore £395 per QALY, which is particularly low in comparison with standard thresholds of £20,000 or £30,000.

In general, the changes modelled here have relatively little to do with increases in the total vascular workload (as opposed to the workload of vascular surgeons), and more to do with where treatment is conducted and who provides it. As a result, increased travel is mostly borne by those in areas that are a significant distance further from Sheffield and where previous practice saw most surgery conducted locally. The main areas where travel is expected to increase are North Derbyshire (9,100 additional miles) and Barnsley (6,600 additional miles). Total travel distances are expected to fall slightly in Sheffield (700 miles) and Worksop (500 miles), the latter in part due to the reorganisation of many services to a marginally closer central unit at Doncaster.

Overall, the additional travelling distance estimated for vascular surgery was estimated to be 9,400 miles per year as well as 10,800 miles for outpatient appointments. In per-patient terms, patients travel an average of 3.9 additional miles over the course of their treatment. Of course, this travel will be borne more by those transferred who would previously have been treated locally. A Chesterfield-based patient treated for an amputation can expect to travel an extra 43 miles if they are treated in Sheffield rather than locally (once for the operation, plus 0.45 central outpatient appointments).

Using a cost-per-QALY threshold of £20,000 per year, the net benefit of centralisation (costs plus QALY changes at £20,000 each) is £4.6 million at a cost of 20,200 additional miles travelled. Travel must therefore be valued at less than £229 per mile. To place a QALY value on travel, the cost per QALY threshold can be divided through by this figure. The trade-off tells us that when evaluating two programmes, one that increases the number of total QALYs by one and another that reduces total travelling by 87 miles, the decision maker would choose the former. This does not tell us, however, how many miles a QALY is worth, but provides only a minimum figure.
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The assumptions used to form the analysis are modified within a sensitivity analysis, which is summarised in Table 3.2. To interpret this table, it is helpful to note that of the three sources of changes, specialist management of PVD (causing a reduction in amputations) and increased carotid endarterectomies (CEs) are cost saving, while aortic surgery transfer produces benefits at approximately £1,600 per QALY. Overall, the changes in the assumptions do not affect the overall cost-effectiveness relative to standard thresholds, and have only a small effect on the cost per mile and on the minimum threshold for maximum miles per QALY. As the number of central outpatient appointments increases, the number of outpatient miles increases and the maximum cost per mile decreases.

An increase in the cost-per QALY threshold to £30,000 increases the maximum cost per mile almost proportionately to £346 per mile. The minimum miles per QALY are almost unchanged when the threshold changes because the cost repercussions of reorganisation are small in comparison with the monetised QALY value. This suggests that the reorganisation of vascular services was defensible. Where there is a major benefit in terms of QALYs, then travel to a specialist centre for surgery may be justified. Even if reorganisation means that patients have to travel for investigations or clinics, the analysis suggests that centralisation would still be acceptable for vascular surgery.

3.3 Waiting list initiatives for varicose vein surgery

3.3.1 Background

Waiting time – or temporal access – has become a key part of NHS policy. It seems unlikely that earlier intervention will be less effective, but it could more expensive, and there is therefore the potential for a trade-off between temporal access and cost-effectiveness. This may well be the case for some waiting list initiatives where additional activity is funded outside of normal working hours, or is done in a more expensive private sector setting. A theoretical, but feasible, case study of a waiting list initiative was used, which involves a private sector provider being contracted to perform varicose vein surgery for patients who would otherwise experience an average wait for the same operation in an NHS setting.

If the additional cost of getting patients treated privately is denoted as \( \Delta C \), the quality adjusted life years gained from earlier treatment as \( \Delta Q \), which is valued at \( \lambda_Q \) per QALY, and the overall reduction in waiting time achieved as \(-\Delta W\), then it is possible to get some idea of the value (denoted by \( \lambda_W \)) given to waiting time by the decision maker who chooses to pay for a waiting list initiative because:

\[
\lambda_Q \times \Delta Q + \lambda_W \times (-\Delta W) > \Delta C
\]
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i.e. the QALY and waiting time gains achieved by the initiative must implicitly outweigh its costs. Rearranging this equation, an implied minimum value for patient waiting time is obtained when considered in a trade off against cost and effectiveness i.e.

\[ \lambda \text{W} < (\lambda \text{Q} \times \Delta \text{Q} - \Delta \text{C}) / \Delta \text{W} \]

A case study of varicose vein cost-effectiveness is used to attempt to infer a minimum value for waiting times if a decision maker decided to invest in a waiting list initiative.

3.3.2 Methods

An existing cost-effectiveness model based largely on a clinical trail of treatments for varicose veins, and to be published as part of the HTA series, was used (project reference 95/05/06 at the HTA website). This Markov decision tree was developed to assess cost and effectiveness of sclerotherapy, surgery, and conservative treatment over 120 months. The health states considered included both surgical and post-operative states, including complications, co-morbidities and the subsequent recurrence of varicose veins. Any re-do surgery takes place on the NHS in the month following veins returning to the pre-surgery state.

The version of the model used here considers the group of patients in the HTA trial with the most severe form of varicose veins. For these patients, the only available treatment options are conservative management and surgery. The model concludes that surgery is a cost-effective option relative to conservative management, and so only surgery is considered here. A waiting state prior to surgery is added that was not in the original model so that the trade-off can be formulated. Figure 3 (next page) shows the influence diagram for the model. Each state below also includes links to co-morbidity and death, where death is a terminal state and co-morbidity links only to itself and death. Transient complications (e.g. wound infections and haematoma following surgery), are modelled as part of the surgical state, and non-transient complications have been subdivided into minor (e.g. areas of paraesthesia) and major (e.g. deep vein thrombosis, pulmonary embolus, and motor nerve damage) complication states.
Most transition probabilities within the model are based on figures within the clinical trial on which the HTA model was based, and the development of minor and major complications was based on data from both the clinical trial and literature review. General mortality figures are based upon age-related Department of Health mortality tables for England and Wales, while surgical mortality is based on HES.

All costs are assessed from an NHS perspective at 2002/03 prices. Costs within the HTA model were based on data from the clinical trial and are incurred at the time of surgery (£785) and when minor (£91) or major (£1387) surgical complications develop. Transient complications are included in the cost of surgery; for NHS-provided surgery these complications were included in the HTA costing and for private patients the cost of surgery includes the cost of after-care. There are no ongoing costs from complications. The cost of private surgery was obtained using figures from the BUPA website (accessed June 2005), adjusted for the number of patients with bilateral varicose veins observed in the HTA model. This price was deflated for 6% inflation over two years, resulting in a private surgery cost of £1895 as against an NHS cost of £785.

Utilities are based on clinical trial data at one-year follow-up. Baseline utility for this group (Group 3) is 0.76 and the utility of asymptomatic patients is 0.85. The utility of co-morbidity was assumed to be 0.70, and the utility of the less serious varicose vein states were chosen to be between the baseline and asymptomatic states (Group 1 utility=0.82, also minor complications; Group 2 utility=0.79, also major complications). The surgery/redo-surgery state was assumed to have a utility of 0.60 (SF-6D utility, following the HTA model).
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As health will not deteriorate while waiting (barring co-morbidities or death), there is no cost to the patient beyond the disutility of waiting. With costs and benefits discounted at 3.5%, both NHS costs and QALY benefits to the patients decrease while waiting. The cost-effectiveness of NHS treatment decreases slightly with increased waiting lists; treatment costs fall through discounting but benefits fall through discounting, increasing age-related mortality, and the limited time horizon used in the model. It was assumed that any complications or repeat surgery would be managed in the NHS at the same cost as NHS-treated patients.

Within Sheffield, recent waiting list initiatives have decreased waiting targets from 12 to 9 months, and then from 9 to 6 months. At the time of target implementation, patients waiting for 6 months must be treated and so the trade-off weighs the benefits from earlier treatment (QALY benefits, up to 3 months waiting time avoided) against the increased cost of private treatment. In order to consider the trade-offs from cutting waiting lists, it is assumed that an equal number of people are due to be treated in one, two and three months time on the NHS. Note that the limitation of the analysis here is that it assumes little or no effect on those patients on the NHS waiting list. This may be appropriate if the initiative is to remove a small number of patients from the NHS list. However, if the initiative has a large impact on the NHS list, the implied minimum value of waiting time will be over-estimated.

3.3.3 Results

Over a time horizon of 10 years, the cost per patient of varicose vein surgery includes the cost of the initial operation (which includes the cost of transient complications), the cost of any re-surgery, and the cost of developing non-transient complications. The total discounted cost of private treatment per patient is £1,989, providing 6.753 QALYs within this period. For those for whom waiting lists mean that surgery will take place after a further month’s wait, NHS treatment is less expensive (£875) but provides less health over 10 years (6.750 QALYs) per patient. As waiting increases to two and three months treatment per patient becomes less expensive (£871, £867 respectively) and leads to further reductions in total health gained (6.747, 6.744 QALYs).

For those waiting three, two or one fewer months following private treatment, the cost-effectiveness ratios are approximately £125,000, £187,000 and £373,000 per QALY. Over all three groups, cutting waiting produces benefit at £187,000 per QALY, which is far higher than standard threshold figures. Using a cost-per-QALY threshold of £20,000 per year, the overall cost per patient of cutting waiting time (net of QALY benefit) is £999 for an average time saving of two months. Therefore, waiting must have an implicit weight of at least £499 per month in decision making in order to justify the waiting list.
The trade-off tells us that when evaluating two programmes, one that increases the number of total QALYs received by one, and another that reduces waiting time by 41 months, the decision maker would choose the latter. This does not tell us, however, how many months a QALY is worth, but provides only a maximum figure.

The assumptions used to form the analysis are modified within a sensitivity analysis, which is summarised in Table 3.3. The sensitivity analysis within the HTA report on which the model is based found that one of the few sources of uncertainty to have a significant effect was the size of the utility gain from treatment. In the base case, the difference in health state between the symptomatic and asymptomatic states (experienced before and following successful treatment) is 0.09 (or 0.0075 QALYs per month). Where this utility difference is decreased to 0.06 (and the other intermediate states are similarly compressed), treatment becomes less cost-effective at £344,000 per QALY and the disutility per month of waiting must be at least £580 per month. If, instead, the utility difference is increased to 0.12 the ratio improves to £141,000. The numbers of months per QALY in these cases are 38 and 42 months respectively. The size of the utility gain, therefore, has little effect.

The cost of private treatment is more important, with the cost-effectiveness increasing to £255,000 per QALY (£702 per month, or 28 months per QALY at a £20,000 threshold) if the cost of private treatment increases to £2,300, and decreasing to £121,000 per QALY (£302 per month, or 66 months per QALY at a £20,000 threshold) with a £1,500 private cost for surgery. Where the cost-effectiveness threshold is increased to £30,000 per QALY, the minimum disutility of waiting is valued at £470 per month or greater. The cost-effectiveness of private treatment increases with the length of time that an individual would need to wait before NHS treatment was available. In order for treatment to be cost-effective at a £20,000-per QALY-threshold, an individual would need to face an NHS wait of 20 months.
3.4 Provision of smoking cessation services

3.4.1 Background

NHS specialist smoking cessation services (the Stop Smoking Services) were set up in 1999 following the “Smoking Kills” White Paper (http://www.archive.official-documents.co.uk/document/cm41/4177/4177.htm [Accessed June 2005]). These services provide either group or individual support from trained advisors as well as drug treatment (nicotine replacement therapy (NRT) and/or bupropion). These services were first established in more deprived areas of the country through the newly created HAZs before being rolled out to all district health authorities the following year. Service providers were also encouraged to target their more deprived neighbourhoods within individual health authority areas.

The decision was made to look at the trade-off between equity and cost-effectiveness when these smoking cessation services are provided for less affluent population groups. The original assumption that a trade-off existed was based on the limited literature suggesting smoking cessation services are more effective in higher income populations (Hymowitz et al, 1991; West et al, 2001) who would also be expected to have better health. The impact of socio-economic status at the population-level on overall cost-effectiveness is supported by the routine national evaluation data on smoking cessation services, which show a consistently higher cost-per-quitter in the more deprived HAZs, despite similar overall expenditure. For example, the average cost-per-quitter in HAZs in 2002/3 was £217 compared to £184 in other health authorities.

3.4.2 Methods

The NHS Stop Smoking services (SSS) provide smokers with advisor support and pharmacotherapy. Because advisor support can take many forms, patients are categorised by whether NRT and/or bupropion (Zyban) is prescribed. Individual level data on service use and outcomes from the evaluation of smoking cessation services between 2001 and 2003 are used (Ken Judge, personal communication). This data considered the short-term effectiveness of services (4-week CO-validated quit rates) in two Health Action Zones (Nottingham and North Cumbria) from 6959 service users.

For the model, data from a subset of this population with sufficient data are used to allow treatment efficacy, costs and socio-economic status to be estimated. The dataset includes six indicators of socio-economic status (education finished at 16, single parenthood, rented housing, not employed, eligible for free prescriptions and postcode in lowest deprivation decile). Each indicator that a person satisfies gets a
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score of one, and those with a score of more than three are defined as “low” socio-economic group.

Probit models were used to estimate adherence (whether the treatment will last less than four weeks, or four weeks or more) and 4-week quit rates given adherence, the type of support received, socio-economic grouping, and other covariates. The majority of those in the dataset received NRT (80%) or bupropion (15%). Treatment success rates were highest amongst those receiving bupropion and lowest amongst those receiving both bupropion and NRT. Within the regression to predict 4-week quitting, 90% of quitters and 61% of non-quitters are successfully identified (78% overall). Amongst other factors, the chances of successfully quitting appear higher in the “high” socioeconomic group, those indicating lower levels of addiction, and those having greater numbers of contacts with NHS staff. Those receiving NRT or bupropion for more than 4 weeks were significantly more likely to quit than those receiving it for less. The equations used to predict treatment length were successful in discriminating between treatment for less than 4 weeks and treatment for four weeks or more amongst the 79% of those receiving bupropion and 83% of those receiving NRT.

Since effectiveness was only measured in terms of 4-week quit rates, these had to be extrapolated to estimate longer-term quit rates. A 65% relapse rate between 4-week quit rates and those at one year was used (Stapleton, 1998). A 35% lifetime relapse rate from one year and a baseline 1.5% yearly quit rate were assumed (when comparing treatment and no-treatment, as opposed to two treatments) in line with standard assumptions (e.g. Wasley et al., 1997; Woolacott et al., 2002).

The estimates of QALY gains from smoking cessation were similar, but not the same, as those used by Fiscella and Franks (1996) with 3% discounting. While the Fiscella and Franks figures have been widely used, there are concerns about elements of the methodology of the Years of Health Life measure on which they are based. A more robust set of valuations, and ones that are based on a UK population, are found in the Measurement and Valuation of Health Research Group database, which provides quality of life estimates (based upon EQ-5D health state descriptions) for smokers and non-smokers.

Mortality for former and never-smokers was estimated using the same smoking-status based US mortality data as Fiscella and Franks for those aged 25-75 years (Rogers and Powell-Griner, 1991). Their estimates for life expectancy above 75 years of age were used to infer life expectancy based on the assumption that mortality increases by a constant proportion every five years from 70 years of age (all individuals die at 100 years). Mortality for those from 20-24 years of age is based on Centers for Disease Control data (CDC, Table 290). The mortality of quitters equals that of smokers initially, and decreases to that of never-smokers after 20 years. Quality of life
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figures, and the Fiscella and Franks alternatives, are given in Table 3.4. Counselling costs per person are based on whether individual (£50.13) or group therapy was received (£67.68). Pharmaceutical costs per person are based on observed frequencies of use, conditional on treatment (NRT, bupropion) lasting at least four weeks (£58.55; £58.81) or less than four weeks (£18.50; £21.43). All costs are from Woolacott et al (2002).

The aim was to analyse the data at several different levels. At the individual level, the expected cost-effectiveness of different treatments were compared to estimate how cost-effective, for example, NRT treatment was to those receiving NRT versus the case in which they had received an alternative treatment. The aim was to find results such as those displayed on Figure 4 (see next page), which considers the cost-effectiveness of treatment for those receiving B when A, B and C are options. Here, the first trade-off suggests a cost-effectiveness threshold above £10,000 per QALY (since B is preferred to A) and the second suggests a threshold below £18,000 per QALY (since B is preferred to C). If, in a similar way, and for illustrative purposes, another group (also receiving B) has a cost per QALY threshold above £19,000 and below £30,000, then it is possible to say that there is a definite premium to treating this second group.
Definitive results at this level are contingent upon there being no overlap between the groups, and so other trade-offs were considered. Note that each treatment option must be optimal for those individuals receiving it at a given cost-effectiveness threshold; this level does not need to be the same for each treatment. Secondly, these trade-off ranges varied by location. This trade-off attempts to assess whether there are meso-level differences in the data. This relies on the validity of the individual level trade-off. In the final trade-off, the estimated cost-effectiveness of a single treatment, NRT (which accounts for the majority of the data) is considered. This allows the construction of a trade-off that is not confounded by who actually received which treatment.

To calculate real-world trade-offs at the individual level, there is a situation in which each selected treatment is optimal over a range of possible cost-per-QALY thresholds. If costs are identical between high and low socio-economic groups, then the incremental cost-effectiveness ratios (ICERs) will typically be higher for the low socio-economic groups. However, this is not possible because typically only counselling, or counselling plus bupropion are optimal at any cost-effectiveness threshold. Splitting the data into meso-level groupings (Nottingham, North Cumbria) does not alleviate this problem. As Figure 5 (next page) displays, this problem is an issue in both locations. As any trade-off based on only 18% of the available data is unreliable, it is not possible to put any weight on this comparison. Analysis is therefore limited to the main treatment group (80% of data), who had all been managed with personal support plus NRT, and
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examine the impact of treatment decisions at the service, rather than individual, level.

Figure 5  Individual level trade-offs in Nottingham and North Cumbria

Nottingham

North Cumbria

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3.4.3 Results

Both costs (due to higher adherence) and benefits (due to higher quit rates) were greater for the high socio-economic group: expected quit rates are 14.6% and 9.3% at 4 weeks; costs are £102 versus £90, and average benefits are 0.204 QALYs versus 0.130 QALYs. The cost per QALY for the high socio-economic group is £503, and £692 for the low socio-economic group.

Assuming a value of £20,000 per QALY, the net benefit of treating someone in the high socio-economic group is £3970 versus £2525 for the low socio-economic group. This suggests that the value of the equity gain from choosing to treat someone from the lower socio-economic group must be at least £1445. The cost per QALY threshold may differ between high and low socio-economic groups. With an average cost-per QALY of £20,000, the net benefits of treatment to the high and low groups are equalised when these thresholds are £15,600 and £24,400, suggesting a trade-off between cost-effectiveness and equity within the programme itself.

The assumptions used here are modified within a sensitivity analysis. Table 3.5 outlines the sensitivity of the results to the assumptions made. Where a £30,000 per QALY threshold is used, the difference in net benefit between the groups increases to £2,188 and the per-group thresholds increase to £23,400 and £36,600 respectively. As both treatments are highly cost-effective, the level of QALY benefit and the appropriate threshold largely determine net benefit. Hence, it is unsurprising that neither the difference in net benefit nor the per-group thresholds are greatly affected by assumptions made regarding monthly NRT costs. Changes in assumptions relating to QALY benefits have a greater effect. If the difference between the QALY benefits are halved, the net benefit is also halved (£722) and the difference between per-group thresholds implied by the trade-off fall by approximately one half (£17,800, £22,200).

3.5 Discussion of implicit trade-offs

The three case studies reported here give some insight into the implied trade-offs between cost-effectiveness and each of geographical access, temporal access and equity. More generally, all the case studies highlight the value of attempting to model and to quantify trade-offs rather than assuming that any potential trade-offs identified will be of the size or direction that initial consideration of the issues might suggest.

In the first case, while the idea of transferring services towards central locations is likely to prove controversial, the analysis suggests that the minimum cost per mile required to make the trade-off no longer worthwhile is very high. In particular, it is far higher than the cost of providing transport, and is also higher than the value patients are likely to be willing to pay themselves. This suggests that the
reorganisation of vascular services was defensible. Where there is a major benefit in terms of QALYs, then travel to a specialist centre for surgery may be justified. Even if reorganisation means that patients have to travel for investigations or clinics, the analysis suggests that centralisation would still be acceptable for vascular surgery.

While the first trade-off specifically considered the centralisation of vascular services, the trade-off does raise general issues. Centralisation was induced by the sub-specialisation of vascular surgery into a defined sub-speciality. As standards of care for particular conditions rise, other sub-specialties continue to emerge in both surgical and non-surgical care. These services provide specific expertise and do so because service delivery differs from non-specialist services, because of volume outcome effects, or for some other reason. While non-specialist services could adopt specialist practices, volume-outcome (and similar) effects require that each hospital or physician receive a caseload above a specific level. Where a condition is uncommon, not all physicians or treatment centres will receive a sufficient caseload to exploit volume-outcome effects; a conflict between “best care” and “closest care” inevitably emerges. The type of trade-off considered here is illustrative for decision makers in such cases, and provides a framework for considering the advantages and disadvantages of centralising services more generally.

However, the finding that a potential high value might apparently be assigned to travel may lead to consideration of the importance of other values, not quantified by these models, which will influence decisions. As already identified by the qualitative interviews, decisions involving the loss of local services are a good example of this: the perceived significance of a loss of local services is much greater than just the need for more travel. Moreover, as also picked up on in the follow-up interviews, it is not just the distance that matters but how easily you can make the journey. If you are reliant on public transport (i.e. more likely to be old and/or poor), then this is a bigger issue for you. It also implies that access (distance) is inextricably linked with equity.

The trade-off, while informative, has inevitable limitations as it must be evaluated by modelling rather than direct observation. The analysis was based on a model assessing the likely impact of alternative service provision where none of the options considered closely matches subsequent provision, which necessitated revisions to the model. For some parameters, including the proportion of outpatient appointments occurring locally, it was either impractical to use existing local data sources or such data was not available. Here, we needed to use expert judgement of the local vascular service and as such significant uncertainty remains over several key parameters. We also assume that casemix remains similar over time (for example, the breakdown of HRG Q05, and the proportion of elective versus non-elective cases) and use strong assumptions in our base case (for example, in the treatment of reduced amputations).
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The analysis of the trade-off between cost-effectiveness and temporal access implies that the cost-effectiveness ratio of the treatment of a few individuals who would otherwise wait beyond the new waiting list target is £187,000 per QALY. The disutility of waiting must be at least £499 per month in order to justify treatment here; in contrast the symptoms of severe varicose veins have a utility cost of 0.0075 per month, or £150 at £20,000 per QALY. The implicit trade-off suggests that the process disutility of waiting is weighted much more highly than the disutility of ill health. While decisions to reduce or deny individuals access to services will be contentious, the trade-offs considered in the case studies suggest that the opportunity cost of access varies widely; in one trade-off (the centralisation of vascular services) large health benefits were available by reducing access slightly, in the other trade-off (a varicose veins waiting list initiative) increases in access may be far from cost-effective.

Of course, real trade-offs may be more complex as, for some progressive conditions, earlier treatment will be more effective than later treatment. This case study also assumes that the provision of surgery in the private sector has no additional impact on NHS provision, so that the only people affected are those receiving treatment. This may be unrealistic but creates a relatively simple trade-off to examine. A more complex trade-off, with increased benefits for the same costs, would result if a waiting list initiative also reduced NHS waiting times. However, it is unclear for how long waiting lists initiatives have an effect.

In relation to the trade-off between cost-effectiveness and equity in the context of smoking cessation, the analysis suggests that the interventions are highly cost-effective for all socio-economic groups, and so it would seem rational to ensure that these services are available to all population groups. However, in the context of limited ring-fenced resources for smoking cessation services, there does appear to be a genuine trade-off between providing a specific intervention to higher socio-economic status individuals, in whom it is more cost-effective, and providing it to lower socio-economic groups.

Published aggregate data suggest that the cost per quitter in HAZ areas is higher than in other areas. In the analysis, however, lower socio-economic groups within the HAZ areas were less expensive to the NHS than higher groups. Here, the higher number of non-quitters in the lower socio-economic groups meant that treatment was of shorter duration, and hence cheaper to the NHS. It is therefore important that these outcomes be modelled carefully. This problem becomes more complex given that there may be significant overlaps between equity and access. Part of the rationale within the health service for focusing treatment towards poorer groups may be the reduced access they currently face. Since this reduced access may partly be due to the choices made by patients in lower socioeconomic groups, such choices may impact cost-effectiveness, equity and access together. This will complicate any attempt to find distinct trade-offs for
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different socioeconomic groups either between groups or across aims. Such overlaps between equity and access were identified in the qualitative interviews, and so this issue is far broader than the specific case study addressed here.

This case study was based on complex patient-level data and required several changes to our analysis strategy, and in particular required ignoring the 20% of the sample who did not receive NRT (or who received both NRT and bupropion) in order to produce coherent trade-offs. It was also uncertain whether 4-week data is sufficient to assess smoking cessation, with the relationship between 4-week and lifetime quit rates based on isolated references in the literature. We were also unable to consider counselling treatment except as a background variable which is a concern if interactions exist between the counselling and pharmacological treatments.

This case study also revealed that apparent trade-offs at the overall service level might not be reflected in decisions made at the individual level. Treatment choice for individuals may be largely based on factors such as patient preference and clinical judgement, and this makes it extremely difficult to infer any trade-offs between cost-effectiveness and personal characteristics, including baseline risk of poorer health outcomes. Given that bupropion, for instance, is more expensive for patients after free NHS prescriptions end, it is possible that a form of financial access to treatments was being used, so that choices were not made purely on cost-effectiveness, equity or access grounds.

More generally, there may be significant overlaps between equity and access, and this was certainly borne out in the qualitative interviews. Part of the rationale within the health service for focusing treatment towards poorer groups may be the reduced access they currently face. This will complicate any attempt to find distinct trade-offs in any of the case studies.

Such problems are compounded by difficulties with the availability of appropriate information. In the case of waiting lists, information was not available on how waiting lists for varicose vein surgery are affected by waiting list initiatives, and crucially for how long waiting lists would be reduced. This is particularly difficult given the possibility that once lists are reduced, the area may become a lower priority and lists may be allowed to grow once more. Moreover, in the smoking cessation example, there was difficulty in finding appropriate QALY estimates for quitting smoking.

3.6 Comparison of DCE and implicit trade-off results

It is possible to compare the results from the implicit trade-offs in Section 3.5 with the DCE results. In each case, it is necessary to note that the DCE results produce a specific trade-off between cost-effectiveness and equity and cost-effectiveness and access while the
implicit results produce only an upper or lower estimate of these trade-offs.

In relation to the trade-off between cost-effectiveness and geographical access, the DCE results suggest that a project that produces an additional QALY in total is valued 5.84 times more highly than a reduction of one mile in the average distance that individuals would have to travel to a hospital. Suppose a programme was changed so that it produced one more QALY at the cost of 5.84 miles in distance to each patient. In terms of the DCE, this change has no effect on utility. If 60,000 patients are affected by decisions (which was the average number respondents were thinking about), then the total reduction in travelling distance will be approximately 701,000 miles if each individual makes a single return trip to hospital. If the additional QALY is valued at £20,000 then the cost per mile travelled is £0.03 (£20,000/701,000 miles). If, as is likely, each person affected will make more than one trip on average, then the cost per mile travelled falls further.

The implicit trade-off between cost-effectiveness and geographical access for the centralisation of vascular services case study suggests that each mile must be valued at most £229 per mile. As such, there is again no conflict between the implicit trade-off and that provided by the DCE regression. There is only minimal potential for conflict between the two types of results, as disagreement can only occur if fewer than 87 miles are travelled (£20,000/£229 per mile). This equates to fewer than eight individuals travelling an average distance once.

In relation to the trade-off between cost-effectiveness and temporal access, the DCE results suggest that a one month reduction in average waiting time is valued as highly as an increase in total benefits of 1.47 QALYs. Given a cost-per-QALY threshold of £20,000, a month’s reduction in average waiting time is worth £29,400 (1.47 QALY×£20,000 per QALY). While the populations affected by decisions average 60,000, not all of these are likely to appear on waiting lists. If the waiting list is 1,000 individuals, then waiting time reductions are valued at £29.40 per person per month (£29,400/1,000). This figure will obviously fall where more individuals are affected by the waiting list reduction and increase where the numbers are lower.

The implicit trade-off between cost-effectiveness and temporal access from the waiting lists initiative for vascular surgery case study suggests that the cost per waiting month avoided must be at least £499 for a £20,000 per QALY threshold. Although there are limitations to our analysis that mean this value may be over-estimated, at face value there is a conflict between the DCE and implicit results. This conflict can only be resolved if waiting lists contain at most 58 patients. These waiting lists appear small for varicose vein waiting lists, and hence there does appear to be a genuine conflict in the results. Bear in mind, however, that waiting time is insignificant in the
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PC study, and so there may be some doubt about the preferences over waiting time in the DCE study too. Of course, in the real world, waiting list initiatives might be expected to benefit patients other than the ones treated, by reducing the overall backlog and therefore speeding treatment for subsequent patients, and some respondents may also have had this in mind.

In relation to the trade-off between cost-effectiveness and equity, the results from the DCE study suggest that a programme where all quintiles receive 6.48 QALYs is equivalent to another where the lowest quintile receives 9 QALYs, the highest quintile receives 3 QALYs, and the intermediate three quintiles each receive 6 QALYs. As more QALYs are produced in the former case, it appears that the cost-per-QALY threshold is different for the highest and lowest quintiles. Here, the costs of each programme are the same and their benefit is:

$$\lambda_1 \text{QUALY}_1 + \lambda_2 \text{QUALY}_1 + \lambda_3 \text{QUALY}_3 + \lambda_4 \text{QUALY}_4 + \lambda_5 \text{QUALY}_5$$

where $\lambda_i$ is the cost-per-QALY threshold for the quintile i (1=lowest, 5=highest). The overall benefit of two equally costly, equally beneficial, programmes must be the same. If a £20,000 per QALY threshold applies both on average (so $\lambda_1 + \lambda_2 + \lambda_3 + \lambda_4 + \lambda_5)/5 = £20,000 per QALY) and to the three intermediate quintiles ($\lambda_1 = \lambda_2 = \lambda_3 = £20,000 per QALY), the cost-per-QALY threshold that applies for the highest and lowest quintiles can be calculated. From the examples above, it is possible to infer that benefits to the lowest and highest quintiles must be valued at approximately £28,000 and £11,200 per QALY, respectively.

The implicit trade-off between cost-effectiveness and equity from the smoking cessation case study suggests that if the average cost-effectiveness threshold is £20,000 per QALY, then this requires that the value placed on a QALY should be at least £24,400 for the worst off group and at most £15,600 for the best-off group. While the best and worst off groups in the smoking cessation example do not correspond to the quintiles perfectly, there does not appear to be a conflict between the implicit ranges and DCE values.
4.1 Presentation toolkit

The aim here is to produce a manual for the NHS based on lessons learned from the project. The objective is to provide a framework for individuals in the NHS to make specific trade-offs where there is a conflict between the objectives of cost-effectiveness, equity and access. We envisaged a ‘toolkit’ in the form of a presentation in electronic form with some interactive work with the audience. A number of similar toolkits exist on the Department of Health Web pages to guide practitioners through change management dilemmas.

It is important that the toolkit demonstrates how trade-offs do take place and develop practical methods for identifying implied trade-offs between concepts that. Option appraisal is embedded within the decision making process at various levels of NHS service planning. A key feature of option appraisal is that various options are compared to and weighed against each other. The purpose is to make the decisions transparent and explicit.

The toolkit consists of a PowerPoint presentation, the template for which can be found in Appendix C. It is envisaged that the toolkit can be presented as a core presentation of about an hour or extended using more group work to use in service training days. In fact, it was possible to conduct a small pilot with the toolkit. Two members of the public health team from our local strategic health authority agreed to take part, and member of the research team acted as presenter and facilitator. The participants reported that they found the toolkit challenging, thought provoking and agreed that they would be able to use the experience to influence future decisions.
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Section 5  Concluding remarks

5.1 Introduction

This section reviews the contribution of the project in terms of its four main aims. It also highlights priorities for future research.

5.2 Clear working definitions

The first aim of the project was to provide clear working definitions of cost-effectiveness, equity and access. The objectives here were to: identify key literature that provides definitions of cost-effectiveness, equity and access (section 1.1); review the ways in which the concepts are used in official NHS documents (section 1.2); and investigate what decision-makers at the macro, meso and micro levels mean by these concepts (section 1.3).

Cost-effectiveness has a reasonably clear meaning in the key literature, the policy documents and in the qualitative interviews that were conducted, but it is sometimes difficult to incorporate into practice for both operational and political reasons. Equity and access are not encapsulated in simple terms. In the NHS, one of the main ways in which a more equitable distribution of health outcomes is achieved is through the promotion of greater access to services, and so it is hardly surprising that these concepts sometimes get mixed up. The literature and the interviews highlighted the lack of clarity about what equity and access mean, and the overlap between them. It also seemed that some of the concepts, like cost-effectiveness and reductions in inequalities in health, were not filtering down from the macro to the micro level. All of this means that policy at the macro level is unlikely to be passed down effectively and clearly to decision-makers at the meso and micro levels, and this has obvious implications for the timely implementation of policy initiatives.

It was possible, however, to construct working definitions of the concepts from the qualitative interviews for use in later stages of the project. The interviews also highlighted the importance of being very clear about what is meant by particular terms in the survey stages of the project. Access was defined in two ways: in terms of the distance that people have to travel to utilise services (geographical access) and how long they have to wait to use those services (temporal access). Equity was defined in terms of reducing inequities in health and cost-effectiveness as the maximisation of health benefits. By adopting these definitions, it was possible to provide measurable concepts that facilitated trade-offs between them in later stages of the project.
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We believe that the views expressed by our respondents would find resonance across a wide spectrum of NHS staff. However, although the respondents were from a cross-section of NHS decision-makers, it is possible that we would have found greater disagreement about concepts if we had been able to interview a wider range of NHS personnel than the fourteen in our sample.

The complex nature of the concepts of cost-effectiveness, equity and access was generally recognised by our participants. This meant that sometimes the terms were open to misinterpretation depending on the background of the participant and their recent exposure to the terminology in government policy documents. An example of this was the interviewee for whom ‘access’ could also mean the previous directives around physical access and adapting buildings for wheelchair users. The Department of Health need to be aware that the terminology used in official policy documents must be clear and easily understood by all levels of staff in the NHS. A description of what they mean by the terms cost-effective, access and equity might improve the quality of decision-making.

5.3 How decision-makers think about trade-offs

The second aim was to show how decision-makers think cost-effectiveness, equity and access should be (and are) traded off against one another. The objectives here were to: develop new instruments to show how decision makers think the trade-offs between cost-effectiveness, equity and access should be made (sections 2.2-2.4); estimate how decision-makers think general trade-offs between cost-effectiveness and equity should be (and are) made, using instruments that have been administered on population samples; and compare the preferences of decision-makers with those of the general public (section 2.1).

In relation to the last of these objectives, it seems that the NHS staff in the sample are less willing to target resources to those with lower life expectancy at birth (the lowest social class and men) than a UK general population sample. The majority (53%) chose not to target, which compares to a minority (42%) of the general public. This study also asked respondents who should be on a committee for making health care resource allocation decisions. The NHS staff sample and the general public sample (whose preferences were elicited in an earlier study) agree on having a GP and a hospital doctor, but they disagree on having a patient representative and a health services manager. The less favourable view of patient representatives on the part of NHS staff bears out the results of the qualitative interviews.

The replication study only considered the trade-off between cost-effectiveness and equity, and so a discrete choice experiment (DCE) was conducted that required respondents to simultaneously trade these concepts against one another. The results of this study raised a
problem encountered in many other DCE studies; namely, that many respondents exhibit dominant preferences (that is, they favour one attribute and do not make trade-offs for other attributes). Health gain was the dominant attribute for over one-quarter of respondents. This is consistent with the results from the attitudinal questions, where 75% of respondents indicated that they agreed with the statement that ‘cost-effectiveness calculations are essential when allocating current service resources’.

It is encouraging for future research that the inclusion of attitude questions before the DCE task seems to reduce the number of non-traders, as well as providing some interesting insights of their own. In general, there appears to be some homogeneity in views around conceptual issues (e.g. the role of the NHS) but less of a consensus about how to turn policy into practice, which is also broadly consistent with the findings from the qualitative interviews. The results of the DCE are suggestive of differences across levels of decision-making with clinicians at the individual level being more concerned about access and less concerned about equity than decision-makers at the meso and macro levels.

The results from the DCE for the trade-off between cost-effectiveness and equity suggest that giving 6.48 QALYs to each quintile (i.e. generating 32.41 QALYs overall) produces the same social benefit as giving the lowest quintile 9 QALYs, the highest quintile 3 QALYs, and the intermediate three quintiles 6 QALYs each (i.e. generating 30 QALYs overall). For waiting time, a one month reduction in waiting time in a programme is valued more highly than a one QALY improvement in health benefits. In order to have the same effect as a one month reduction in waiting time, the total health benefit of the programme would have to increase by 1.47 QALYs. In a similar way, a one QALY improvement in total health benefits has the same effect as a reduction of 5.84 miles in the average distance to a hospital (0.0514/0.0088).

The follow-up interviews suggest that respondents gave considerable thought to the completion of the DCE questionnaire. There are complex views and thought processes expressed which demonstrate the varying levels of sophistication and understanding of the issues involved. Some respondents had the view that waiting time, or temporal access, was beyond their control and they were constrained by policy, which may have affected their preferences in the DCE study. Respondents seemed comfortable with the use of QALYs to inform the decision-making process but there was evidence that some of the respondents understanding of QALYs was quite poor, and this may also have influenced some the choices they made. These findings have important implications for the design of future DCE studies. Encouragingly though, the results are generally consistent with the quantitative results of the DCE survey, and provide additional confidence in the findings of that work.
To overcome some of the problems with a DCE, which requires respondents to consider a number of attributes at once, a pairwise comparison (PC) study was conducted that compared only two attributes at a time in each question. The same sample of respondents was used for both studies. Those who exhibited dominant preferences first time around were more likely to exhibit dominant preferences second time around too. However, there were important differences between the preferences expressed in the two studies (despite attitudes remaining stable). In particular, the size of the equity coefficient was much larger, suggesting a greater weight on equity versus cost-effectiveness than suggested in the DCE data, and waiting time ceased to be significant, suggesting that it is not important. This means that it is not possible to calculate a trade-off between QALYs and waiting time. Preferences may have changed from the DCE and waiting time might genuinely not be important but the possibility that the PC design, in some way or other, induced responses that made waiting times appear as if they were not important cannot be ruled out.

An obvious limitation of the quantitative studies carried out under Aim 2 is that they were all postal surveys and, as such, the responses could be superficial and not well considered. There are no opportunities to ask questions for clarification as in an interview, or to bounce ideas off others as in a discussion group setting. However, we have reasonable insight into the way in which respondents to the DCE study may have addressed the survey because of the qualitative follow-up.

It is difficult, as with most empirical work, to determine the extent to which the results from the studies conducted here are generalisable to other contexts. There are at least three important issues to consider. First, there is the representativeness of the sample, which we are fairly confident about. Second, there are questions around reliability and validity of the particular ways in which the questions were asked. It is inevitable that survey questions are simplified versions of the real world questions but, amongst the three quantitative surveys here, the DCE study is likely to be the most generalisable. Finally, there is the extent to which the underlying model of preferences assumed in the quantitative studies is actually applicable to real world contexts. In this respect, the model assumed in the DCE and pairwise study may be said to be too unrealistic, thus compromising their overall generalisability.

However, we have developed the methodology of preference elicitation further and some of the lessons learnt (e.g. the effect that attitudinal questions have on responses) can be used in other areas of application. There is increasing interest in incorporating the views of service providers and service users into NHS policy but the disagreement over who should be involved in NHS decision making bodies raises some interesting questions. Depending on who makes the decisions regarding who should be on the committee, the
committee composition will be affected, and different members will probably have different views on how to allocate the resources.

5.4 Implicit trade-offs and real-world decisions

The third aim of this project was to identify the implicit trade-offs between concepts from real-world decisions. The objectives here were to: assemble and analyse information on NHS service provision that allows the trade-offs between the concepts to be implied from recent decisions; and use these results to estimate the implied weight given to each of the concepts by current decisions about how to provide health services (sections 3.1-3.3). By far the biggest hurdle faced here was the availability of data. There are very few areas where cost-effectiveness data is sufficiently plentiful or robust to allow us to estimate possible trade-offs with our concepts of access and equity.

As it turned out, it was possible to construct three studies in the areas of the centralisation of vascular services, waiting list initiatives for varicose veins surgery and the provision of smoking cessation programmes. In estimating the trade-off between cost-effectiveness and each of geographical access, temporal access and the distribution of benefits, some important trade-offs that are usually buried within a largely political decision were being made explicit. Assuming a cost-per-QALY threshold of £20,000 in each case, the following results are generated: for the centralisation of vascular services, travel is valued at less than £229 per mile; for varicose veins surgery, waiting must have an implicit weight of at least £499 per month to justify the waiting list initiative; and for smoking cessation, the implied minimum value of treating a person in the lower instead of the higher social class is £1445.

Across the three case studies, there were serious difficulties in finding appropriate information. In general, a more abstract model can be justified when asking a more abstract question. For example, health economic models providing cost-effectiveness calculations often concentrate on presenting incremental cost-effectiveness ratios based on changes from using one treatment over another. Here, whether an option is chosen in practice is often unimportant as the result relates to what changes are possible by choosing one option over another. In contrast, since patients and physicians often have at least some freedom to select a treatment, the implicit trade-offs should ideally consider the actual treatments used. Unfortunately, the smoking cessation data used in our third scenario did not allow us to find trade-offs when considering alternative treatments since the data was not sufficiently coherent. However, such differences between actual and ideal choices raises some interesting methodological questions as to whether the aim of economic evaluation is to ask what is possible, or what could be achieved.
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In relation to the generalisability of these results, we only had one case study for the centralisation of vascular services, involving relatively small changes to travel for treatment and significant improvements in outcomes, and so we cannot tell whether other service centralisations would demonstrate similar trade-offs. Whereas increasing the distance travelled for elective vascular services should not be detrimental to outcomes, the time taken to reach surgery for a vascular emergency, and therefore the distance travelled, will have a potential adverse impact on outcomes. Therefore, an example with larger distances between current and proposed centres might produce very different results from our case study, a centralisation with relatively short distances and therefore short travel times.

Similarly, the case study relating to temporal access assumes that outcomes are not time dependent and consideration of interventions that enable more rapid treatment of conditions where outcomes are time-dependent would be more complex and might result in a different trade-off. The complexity of the smoking cessation case study may be sufficient warning against generalising about trade-offs from one context to another. It highlights that both equity and cost-effectiveness are closely linked to access factors and that individual treatment decisions may not appear logical in terms of maximising either cost-effectiveness or equity. However, the methodology and analytical tools we have employed to estimate the trade-offs are readily transferable from one policy context to another.

In relation to the centralisation of services, the methodology could, however, be used to inform future decision making processes, in that explicit calculations of net benefit and total additional travelling distances could be provided as part of the decision making process to allow explicit comparisons to be made between various options for service reconfiguration. One use of quantifying the trade-off between centralised services with better outcomes and greater travel distance may lie in identifying and quantifying the benefits of centralisation. People may prefer to use local services for a wide range of reasons related not only to convenience but also to a preference for familiar and trusted services, and because of their sense of community ownership of, and responsibility for, local services. We might anticipate this type of analysis therefore could be used in providing evidence to support centralising options that are politically less popular than maintaining local services.

The results of waiting list example suggest that the value attached to reducing waiting time for varicose vein surgery in this decision is implied to be considerably greater than the thresholds normally used for determining cost effectiveness of health service interventions. The example considers a number of different potential delays in treatment and looks at the willingness to pay in order to prevent these delays.

For a condition with a stable disutility or risk of complication, the overall disutility is likely to be approximately proportional to the length
of any delay. This presents some difficulty in applying these findings to current NHS practice, in that measures to reduce waiting times tend to be focused on specific performance targets. The result of this is that the impetus for investment in waiting list initiatives is concentrated on relatively small reductions in waiting times around these thresholds and these are likely provide relatively small benefits for the cost. The overall implications of the findings for policy is that current priorities would appear to put considerable emphasis on reducing waiting time, over and above the net benefit of earlier intervention. However, the use of strict waiting time thresholds as a means for achieving this may not make best use of resources compared to potential alternative methods of demand management, such as explicit selection and differential waiting time targets depending on potential gain.

The smoking cessation case study highlights the value of identifying data that can be used to critically examine assumptions about the relationship between cost-effectiveness and equity. Apparent differences in cost-effectiveness at population level may not reveal the nature of trade-offs at an individual level (the "ecological fallacy"). Overall, then, the main value of the case studies appears to be in demonstrating that can be feasible to quantify these trade-offs and that doing so may lead to useful insights about the potential impact of policy choices or changes in practice.

When the results from the case studies are compared to those from the DCE study in section 3.5, there is some consistency for the cost-effectiveness-equity trade-off (the smoking cessation programme), for the cost-effectiveness-geographical access trade-off (the centralisation of vascular services) but not for the cost-effectiveness-temporal access trade-off (the waiting list initiative for varicose veins). In the real world, waiting list initiatives might be expected to benefit patients other than the ones treated, by reducing the overall backlog and therefore speeding treatment for subsequent patients, and this may have confounded some of our results.

5.5 A framework for the NHS

The fourth and final aim of this project was to provide a framework for the NHS to make explicit trade-offs when there is conflict between the objectives of cost-effectiveness, equity and access. The objectives here were to: produce an ethical framework for further debate within the NHS about cost-effectiveness, equity and absolute access; develop methodologies, generic tools and decision aids for the NHS to use in other policy and planning areas in order to determine the 'right' balance between concepts; and to disseminate our results as widely as possible so as to promote transparent and consistent decision-making (section 4).

Our experiences throughout this project suggest that NHS decision-makers are interested in exploring the potential trade-offs between
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cost-effectiveness, equity and access in decision-making, which would be made a lot clearer if they were based upon their own experiences using worked examples. The use of general attitude questions of the kind developed for the studies in section 2 may also prove very helpful. A PowerPoint presentation has been developed, which can be presented as a core presentation of about an hour or extended using more group work to use in service training days.

Of course, the ‘Powerpoint’ presentation as it currently stands should not be considered as a finalised toolkit to be used by the NHS. Further piloting is required to modify the slides to ensure the content is appropriate. To take things forward, the following further developmental work should be considered:

- Additional piloting of the slides as they currently stand with PCT boards etc.
- Modification of the slides following further piloting
- Production of a short paper about access, equity and cost-effectiveness, in terms of definitions, historical background, trade-offs between them etc.
- Lecture notes in support of each slide
- Self-completion or group ‘task’ material to be used within a presentation
- Development of self-directed or distance learning approaches e.g. on-line toolkit
- Staff training techniques that target attitude development and change.

5.6 Future research

There are a number of ways in which future research efforts into the trade-offs between cost-effectiveness, equity and access might be directed. Policy documents could be continually reviewed to determine whether the concepts are being used in a clear and consistent way. There is considerable potential for further research around whether there is real understanding of some of the issues like the use of QALYs to measure health outcomes. It is of some importance that lack of clarity may influence choices made in the real world. Additional qualitative work examining the understanding of those at macro, meso and micro levels may highlight the need for an information campaign to increase knowledge and awareness of what is being measured and why.

This can then be fed back to policy-makers, which might then result in policy recommendations being better communicated to decision-makers at the meso and micro levels. It may also be helpful to provide regular updates of how these various decision-makers interpret the concepts so that differences in implementation can be better explained. It would also be useful to conduct further preference
elicitation studies that sought to provide information about the quantitative trade-offs that decision-makers would like to see made between the concepts.

Such work must take place against the background of heterogeneous preferences, and consideration must be given to how best to aggregate different preferences. The heterogeneity reported here suggests that any change in policy and service configuration that have implications for cost-effectiveness, equity and access may always be unpopular with some decision-makers. The implied trade-offs in the case studies, however, suggest that many NHS staff will not favour national policies for shorter waiting times and local services because the sacrifice in health gain is too great. More theoretical and empirical work is required to determine whether shorter waiting times and shorter journeys really are worth the high price in terms of health gain that may result (perhaps because citizens gain well-being from knowing that services are accessible).

However, by far the most pressing research need is better quality data about the consequences of different policies and interventions for cost-effectiveness, equity and access. There is currently much talk about evaluating health care according to economic criteria, such as cost-per-QALY but the data available for such assessment is still very scarce. Equity is another important policy goal yet the effect that policies have on the distribution of QALYs across different population subgroups is in even shorter supply. And while access – both in terms of distance travelled and time spent waiting – are also both important policy objectives, the effect that decisions will have on these objectives is rarely quantified.

### 5.7 Conclusion

This project has provided some ways in which it might be possible to infer the trade-offs between concepts from actual decisions where some data exists and so, with the availability of better quality in the future, it might be possible to provide more robust estimates across more contexts. This will serve to show how consistent decision-making is in the NHS. Appropriate incentives can then be put in place to ensure that decisions are more consistent with stated policy objectives. In the meantime, and in consultation with SDO, we plan to disseminate the key messages from our research project through conferences and peer-reviewed journals.
Table 2.1  Factor analysis results

2.1a: Factor analysis on 14-item attitude questionnaire with 432 respondents

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item</th>
<th>Variance</th>
<th>Sums of Squared Loadings</th>
<th>Mean CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) lifestyle inequalities</td>
<td>1,2,3,4</td>
<td>28%</td>
<td>3.9</td>
<td>3.4</td>
</tr>
<tr>
<td>(2) access to all</td>
<td>8,9,10,14</td>
<td>14%</td>
<td>2.0</td>
<td>4.3</td>
</tr>
<tr>
<td>(3) treatment under personal control</td>
<td>11,12,13</td>
<td>10%</td>
<td>1.4</td>
<td>2.1</td>
</tr>
<tr>
<td>(4) class inequalities</td>
<td>5,6</td>
<td>9%</td>
<td>1.3</td>
<td>2.4</td>
</tr>
<tr>
<td>(5) amount of use</td>
<td>7</td>
<td>7%</td>
<td>1.0</td>
<td>2.8</td>
</tr>
</tbody>
</table>

2.1b: Attitude factors and their relationship with equity principles in the NHS

<table>
<thead>
<tr>
<th>Factor</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>(factor 1) Paying more to use NHS services because of lifestyle choices is acceptable</td>
<td>89 (21%)</td>
<td>132 (31%)</td>
<td>211 (48%)</td>
</tr>
<tr>
<td>(factor 2) NHS should be a health service for all funded by taxation</td>
<td>364 (84%)</td>
<td>53 (12%)</td>
<td>15 (4%)</td>
</tr>
<tr>
<td>(factor 3) Having treatment on the NHS is under my control</td>
<td>297 (69%)</td>
<td>104 (24%)</td>
<td>31 (7%)</td>
</tr>
<tr>
<td>(factor 4) Access to publicly funded NHS treatment should be related to social class</td>
<td>210 (49%)</td>
<td>134 (31%)</td>
<td>88 (20%)</td>
</tr>
<tr>
<td>(factor 5) NHS treatment should be associated with amount of use</td>
<td>197 (46%)</td>
<td>87 (20%)</td>
<td>148 (34%)</td>
</tr>
</tbody>
</table>
### Table 2.2 Inequalities in health by questionnaire version

#### 2.2a: Percentage targeting lowest social class

<table>
<thead>
<tr>
<th></th>
<th>version 1</th>
<th>version 2</th>
<th>version 3</th>
<th>pooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-target</td>
<td>55%</td>
<td>52%</td>
<td>50%</td>
<td>53%</td>
</tr>
<tr>
<td>trade-off</td>
<td>35%</td>
<td>33%</td>
<td>42%</td>
<td>36%</td>
</tr>
<tr>
<td>Non-switch</td>
<td>10%</td>
<td>16%</td>
<td>7%</td>
<td>11%</td>
</tr>
<tr>
<td>total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

#### 2.2b: Percentage targeting men

<table>
<thead>
<tr>
<th></th>
<th>version 1</th>
<th>version 2</th>
<th>version 3</th>
<th>pooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-target</td>
<td>58%</td>
<td>61%</td>
<td>54%</td>
<td>58%</td>
</tr>
<tr>
<td>trade-off</td>
<td>31%</td>
<td>30%</td>
<td>37%</td>
<td>32%</td>
</tr>
<tr>
<td>non-switch</td>
<td>11%</td>
<td>10%</td>
<td>9%</td>
<td>10%</td>
</tr>
<tr>
<td>total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
### Table 2.3 Who should be on the committee?

<table>
<thead>
<tr>
<th>Potential committee member</th>
<th>Questionnaire version 1</th>
<th>version 2</th>
<th>version 3</th>
<th>pooled</th>
<th>General public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member of the general public on the committee</td>
<td>67%</td>
<td>64%</td>
<td>65%</td>
<td>65%</td>
<td>56%</td>
</tr>
<tr>
<td>Patient group representative on the committee</td>
<td>44%</td>
<td>54%</td>
<td>57%</td>
<td>51%</td>
<td>63%</td>
</tr>
<tr>
<td>GP on the committee</td>
<td>95%</td>
<td>98%</td>
<td>96%</td>
<td>96%</td>
<td>73%</td>
</tr>
<tr>
<td>Hospital doctor/consultant on the committee</td>
<td>82%</td>
<td>87%</td>
<td>76%</td>
<td>82%</td>
<td>77%</td>
</tr>
<tr>
<td>Nurse on the committee</td>
<td>56%</td>
<td>61%</td>
<td>52%</td>
<td>56%</td>
<td>52%</td>
</tr>
<tr>
<td>Health services manager on the committee</td>
<td>44%</td>
<td>44%</td>
<td>43%</td>
<td>44%</td>
<td>71%</td>
</tr>
<tr>
<td>Politician on the committee</td>
<td>7%</td>
<td>5%</td>
<td>6%</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>Religious groups representative on the committee</td>
<td>4%</td>
<td>6%</td>
<td>3%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Legal representative on the committee</td>
<td>10%</td>
<td>7%</td>
<td>9%</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Philosopher / ethicist on the committee</td>
<td>21%</td>
<td>18%</td>
<td>21%</td>
<td>20%</td>
<td>13%</td>
</tr>
<tr>
<td>Health economist on the committee</td>
<td>57%</td>
<td>55%</td>
<td>66%</td>
<td>59%</td>
<td>54%</td>
</tr>
<tr>
<td>Other specified person on the committee</td>
<td>6%</td>
<td>2%</td>
<td>5%</td>
<td>4%</td>
<td>21%</td>
</tr>
<tr>
<td>Number of respondents</td>
<td>217</td>
<td>214</td>
<td>205</td>
<td>636</td>
<td>49</td>
</tr>
</tbody>
</table>
### Table 2.4 Descriptive characteristics of respondents (n=380)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>&lt; 40</td>
<td>40 (10.5)</td>
</tr>
<tr>
<td>40 to 54</td>
<td>270 (71.1)</td>
</tr>
<tr>
<td>55 +</td>
<td>61 (16.1)</td>
</tr>
<tr>
<td>Missing</td>
<td>9 (2.4)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>265 (69.7)</td>
</tr>
<tr>
<td>Female</td>
<td>98 (25.8)</td>
</tr>
<tr>
<td>Missing</td>
<td>17 (4.5)</td>
</tr>
<tr>
<td><strong>Level</strong></td>
<td></td>
</tr>
<tr>
<td>Clinically trained and in clinical post</td>
<td>230 (60.5)</td>
</tr>
<tr>
<td>Clinically trained and in managerial post</td>
<td>70 (18.4)</td>
</tr>
<tr>
<td>Non clinically trained and in non-clinical post</td>
<td>58 (15.3)</td>
</tr>
<tr>
<td>None of the above</td>
<td>5 (1.3)</td>
</tr>
<tr>
<td>Missing</td>
<td>17 (4.5)</td>
</tr>
<tr>
<td><strong>Current Post</strong></td>
<td></td>
</tr>
<tr>
<td>Hospital clinician</td>
<td>239 (62.9)</td>
</tr>
<tr>
<td>PCT</td>
<td>102 (26.8)</td>
</tr>
<tr>
<td>SHA/DoH</td>
<td>23 (6.1)</td>
</tr>
<tr>
<td>None of the above</td>
<td>5 (1.3)</td>
</tr>
<tr>
<td>Missing</td>
<td>11 (2.9)</td>
</tr>
<tr>
<td><strong>Private Health Insurance</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58 (15.3)</td>
</tr>
<tr>
<td>No</td>
<td>312 (82.1)</td>
</tr>
<tr>
<td>Missing</td>
<td>10 (2.6)</td>
</tr>
<tr>
<td><strong>Geographical location</strong></td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>325 (85.5)</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>14 (3.7)</td>
</tr>
<tr>
<td>Scotland</td>
<td>17 (4.5)</td>
</tr>
<tr>
<td>Wales</td>
<td>15 (3.9)</td>
</tr>
<tr>
<td>Missing</td>
<td>9 (2.4)</td>
</tr>
<tr>
<td><strong>Difficulty of questionnaire</strong></td>
<td></td>
</tr>
<tr>
<td>Very difficult</td>
<td>19 (5.1)</td>
</tr>
<tr>
<td>Moderately difficult</td>
<td>153 (40.3)</td>
</tr>
<tr>
<td>Slightly difficult</td>
<td>94 (24.7)</td>
</tr>
<tr>
<td>Not difficult</td>
<td>109 (28.7)</td>
</tr>
<tr>
<td>Missing</td>
<td>5 (1.3)</td>
</tr>
</tbody>
</table>
Relative importance of access, equity and cost-effectiveness

Table 2.5 Attitudinal responses – frequency of responses to items by factor (n=288)

<table>
<thead>
<tr>
<th>FACTOR 1 - Necessity of Policy Targets (6 items; 12% variance)</th>
<th>Disagree (0-2) (%)</th>
<th>Neutral (3) (%)</th>
<th>Agree (4-6) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Targets help health professionals focus on what care is important to patients.</td>
<td>57</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>4 Cost-effectiveness calculations are essential when allocating current service resources.</td>
<td>12</td>
<td>13</td>
<td>75</td>
</tr>
<tr>
<td>5 It is essential that NHS services are targeted to the needs of the local population.</td>
<td>4</td>
<td>8</td>
<td>88</td>
</tr>
<tr>
<td>6 Equity should be measured by assessing the impact of service provision on disease rates.</td>
<td>24</td>
<td>15</td>
<td>51</td>
</tr>
<tr>
<td>21 Information gained from equity, access and cost-effectiveness exercises help decision makers to manage the NHS better.</td>
<td>16</td>
<td>16</td>
<td>68</td>
</tr>
<tr>
<td>25 A service cannot be cost-effective if it does not meet patient needs.</td>
<td>22</td>
<td>11</td>
<td>67</td>
</tr>
</tbody>
</table>

FACTOR 2 – Inadequacies of Policy Implementation for Users (5 items; 9% variance)

| 7 Service managers do not know how to interpret the information elicited by current target initiatives. | 17 | 23 | 60 |
| 8 Using waiting lists to measure access is meaningless. | 26 | 9 | 65 |
| 13 Health professionals feel their work is compromised by meeting policy targets. | 6 | 8 | 86 |
| 14 The different values across society make it difficult to reach a consensus on NHS service priorities. | 20 | 11 | 69 |
| 24 A lot of NHS resources are wasted by ‘old style’ management practices. | 21 | 23 | 66 |

FACTOR 3 – Axioms Underpinning Policy (3 items; 7% variance)

| 3 Patients living in deprived areas should have access to more services than those living in affluent areas. | 39 | 15 | 56 |
| 16 People will not pay more taxes to support changes to NHS services. | 60 | 15 | 25 |
| 23 Research should not be a part of routine health care delivery. | 82 | 7 | 11 |

FACTOR 4 – Impact on Service Planning (2 items; 6% variance)

| 17 Cost-effectiveness calculations are not useful for long-term service planning | 66 | 10 | 24 |
| 20 It is important that patients see the health professional they want to see. | 31 | 22 | 57 |

FACTOR 5 – Uncertainty about Policy Prioritising (1 items; 5% variance)
### Relative importance of access, equity and cost-effectiveness

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Factor 6</th>
<th>Factor 7</th>
<th>Factor 8</th>
<th>Factor 9</th>
<th>Factor 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Issues of equity are morally more important than issues of access.</td>
<td>21</td>
<td>36</td>
<td>53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Access should be measured by matching the actual service provision with patient’s preference for services.</td>
<td>46</td>
<td>23</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Access should be measured by whether or not patients received an effective health intervention.</td>
<td>19</td>
<td>12</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Patients are not aware of how resource limitations affect NHS service planning.</td>
<td>17</td>
<td>11</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>People who use the health service more often than average should pay more.</td>
<td>84</td>
<td>6</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>It is the role of the NHS to ensure patients have access to services when they need them.</td>
<td>4</td>
<td>4</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Most health professionals do not differentiate between equity, access and cost-effectiveness when delivering health services.</td>
<td>13</td>
<td>14</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Greater transparency about NHS policy decisions will help patients understand changes in service provision.</td>
<td>13</td>
<td>14</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>It is important that patients can see a GP within 48 hours.</td>
<td>13</td>
<td>10</td>
<td>77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Relative importance of access, equity and cost-effectiveness

Table 2.6 Random effects probit model results

2.6a Full sample (370 respondents, 2937 observations)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Coefficient</th>
<th>P</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>QALY*</td>
<td>0.0630</td>
<td>&lt;0.001</td>
<td>0.0586 to 0.0674</td>
</tr>
<tr>
<td>SHARE*</td>
<td>0.1646</td>
<td>&lt;0.001</td>
<td>0.1040 to 0.2252</td>
</tr>
<tr>
<td>WAIT*</td>
<td>-0.0825</td>
<td>&lt;0.001</td>
<td>-0.0925 to -0.0725</td>
</tr>
<tr>
<td>DISTANCE*</td>
<td>-0.0099</td>
<td>&lt;0.001</td>
<td>-0.0123 to -0.0075</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>0.0326</td>
<td>0.362</td>
<td>-0.0375 to 0.1028</td>
</tr>
</tbody>
</table>

2.6b Non-dominant preferences (221 respondents, 1737 observations)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Coefficient</th>
<th>P</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>QALY*</td>
<td>0.0514</td>
<td>&lt;0.001</td>
<td>0.0461 to 0.0567</td>
</tr>
<tr>
<td>SHARE*</td>
<td>0.1241</td>
<td>0.001</td>
<td>0.0507 to 0.1975</td>
</tr>
<tr>
<td>WAIT*</td>
<td>-0.0755</td>
<td>&lt;0.001</td>
<td>-0.0874 to -0.0636</td>
</tr>
<tr>
<td>DISTANCE*</td>
<td>-0.0088</td>
<td>&lt;0.001</td>
<td>-0.01117 to -0.0059</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>-0.0950</td>
<td>0.025</td>
<td>-0.1778 to -0.0122</td>
</tr>
</tbody>
</table>
## Table 2.7  Summary of choices in pairwise comparisons study

<table>
<thead>
<tr>
<th></th>
<th>Option 1</th>
<th>Choose 1</th>
<th>Choose 2</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>20 QALYs</td>
<td>2 months</td>
<td>53</td>
<td>115</td>
</tr>
<tr>
<td>Q2</td>
<td>30 QALYs</td>
<td>2 months</td>
<td>76</td>
<td>92</td>
</tr>
<tr>
<td>Q3</td>
<td>30 QALYs</td>
<td>30 miles</td>
<td>148</td>
<td>20</td>
</tr>
<tr>
<td>Q4</td>
<td>40 QALYs</td>
<td>30 miles</td>
<td>142</td>
<td>26</td>
</tr>
<tr>
<td>Q5</td>
<td>30 QALYs</td>
<td>20%, 20%</td>
<td>137</td>
<td>29</td>
</tr>
<tr>
<td>Q6</td>
<td>40 QALYs</td>
<td>20%, 20%</td>
<td>122</td>
<td>44</td>
</tr>
</tbody>
</table>
## Relative importance of access, equity and cost-effectiveness

### Table 2.8 Comparison of DCE coefficients from the DCE and PC studies

<table>
<thead>
<tr>
<th>Analysis type</th>
<th>DCE</th>
<th>DCE</th>
<th>PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random effects</td>
<td>Individual level</td>
<td>Individual level</td>
<td>Individual level</td>
</tr>
<tr>
<td>Sample</td>
<td>All respondents</td>
<td>Follow-up</td>
<td>Follow-up</td>
</tr>
<tr>
<td>QALY Coefficient</td>
<td>0.0630</td>
<td>0.0621</td>
<td>0.0629</td>
</tr>
<tr>
<td>95%CI</td>
<td>(0.0586, 0.0674)</td>
<td>(0.0547, 0.0694)</td>
<td>(0.0432, 0.0827)</td>
</tr>
<tr>
<td>SHARE Coefficient</td>
<td>0.1646</td>
<td>0.1252</td>
<td>0.5252</td>
</tr>
<tr>
<td>95%CI</td>
<td>(0.1040, 0.2252)</td>
<td>(0.0221, 0.2282)</td>
<td>(0.1556, 0.8949)</td>
</tr>
<tr>
<td>WAIT Coefficient</td>
<td>-0.0825</td>
<td>-0.0689</td>
<td>0.0372</td>
</tr>
<tr>
<td>95%CI</td>
<td>(-0.0925, -0.0725)</td>
<td>(-0.0858, -0.0521)</td>
<td>(-0.0128, 0.0871)</td>
</tr>
<tr>
<td>DISTANCE Coefficient</td>
<td>-0.0099</td>
<td>-0.0105</td>
<td>-0.0034</td>
</tr>
<tr>
<td>95%CI</td>
<td>(-0.0123, -0.0075)</td>
<td>(-0.1461, -0.0064)</td>
<td>(-0.0187, 0.0118)</td>
</tr>
<tr>
<td>CONSTANT Coefficient</td>
<td>0.0326</td>
<td>0.0644</td>
<td>-0.5927</td>
</tr>
<tr>
<td>95%CI</td>
<td>(-0.0375, 0.1028)</td>
<td>(-0.0531, 0.1819)</td>
<td>(-0.8101, -0.3754)</td>
</tr>
<tr>
<td>N respondents</td>
<td>370</td>
<td>122</td>
<td>168</td>
</tr>
<tr>
<td>N observations</td>
<td>2397</td>
<td>971</td>
<td>1028</td>
</tr>
<tr>
<td>Wald $\chi^2(4)$, sig.</td>
<td>884.67, p=0.000</td>
<td>302.73, p=0.000</td>
<td>167.97, p=0.000</td>
</tr>
</tbody>
</table>
Table 3.1 Summary of case study trade-offs

<table>
<thead>
<tr>
<th>Policy Choice</th>
<th>Main trade-off identified</th>
<th>Key assumptions</th>
<th>Key parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centralisation of vascular surgery services</td>
<td>Better clinical outcomes BUT patients travel further</td>
<td>i) outcomes related to location and volume of surgery</td>
<td>i) change in number of operations done</td>
</tr>
<tr>
<td>Private sector waiting list initiatives for varicose vein surgery</td>
<td>Surgery more expensive BUT shorter waiting times</td>
<td>ii) cost per case unchanged, except for increased length of stay for surviving patients</td>
<td>ii) change in outcome of operations</td>
</tr>
<tr>
<td>Provision of smoking cessation services to those in lower social classes</td>
<td>Lower quit rates BUT treat a high proportion of people from a lower social class</td>
<td>iii) travel increased for surgery, 25% of outpatient visits to central location</td>
<td>iii) extra distance to centralised service compared to local service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iv) distances for clinicians, visiting relatives etc. not considered</td>
<td>iv) improvement in quality of life associated with surgery</td>
</tr>
</tbody>
</table>

Key assumptions:
- i) outcomes related to location and volume of surgery
- ii) cost per case unchanged, except for increased length of stay for surviving patients
- iii) travel increased for surgery, 25% of outpatient visits to central location
- iv) distances for clinicians, visiting relatives etc. not considered

Main trade-off identified:
- Better clinical outcomes BUT patients travel further
- Surgery more expensive BUT shorter waiting times
- Lower quit rates BUT treat a high proportion of people from a lower social class

Key parameters:
- i) change in number of operations done
- ii) change in outcome of operations
- iii) extra distance to centralised service compared to local service

Quantified trade-offs:
- Increased costs: £93,000/yr
- Health gain: 236 QALY/yr
- Extra travel: 20,200 miles

- Increased costs: £1118/operation
- Health gain: 0.007 QALYs/operation
- Wait reduced: 1-3 months

Cost per QALY for lower socio-economic group: £692
Cost per QALY for higher socio-economic group: £503

Monetised trade-offs:
- Implied maximum value of travel
- Implied minimum value of reduced waiting
- Implied minimum value of treating person in

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assuming health outcomes valued at
i) £20K/QALY
ii) £30K/QALY

<table>
<thead>
<tr>
<th>Cost / QALY</th>
<th>Max (£ per mile)</th>
<th>Min miles per QALY</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) £499/mth</td>
<td>£229</td>
<td>87</td>
</tr>
<tr>
<td>ii) £470/mth</td>
<td>£346</td>
<td>87</td>
</tr>
</tbody>
</table>

lower instead of higher social class
i) £1445
ii) £2188.

Table 3.2 Sensitivity analysis for vascular reorganisation trade-offs

<table>
<thead>
<tr>
<th></th>
<th>Old value</th>
<th>New value</th>
<th>Cost / QALY</th>
<th>Max (£ per mile)</th>
<th>Min miles per QALY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE CASE</td>
<td>-</td>
<td>-</td>
<td>£395</td>
<td>229</td>
<td>87</td>
</tr>
<tr>
<td>% Aortic transfers (excl. Worksop, Sheffield)</td>
<td>100%</td>
<td>90%</td>
<td>£294</td>
<td>220</td>
<td>91</td>
</tr>
<tr>
<td>% Carotid endarterectomies in Q05</td>
<td>79%</td>
<td>50%</td>
<td>£478</td>
<td>226</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>50%</td>
<td>£337</td>
<td>232</td>
<td>86</td>
</tr>
<tr>
<td>% decrease in amputations due to changes</td>
<td>100%</td>
<td>50%</td>
<td>£744</td>
<td>197</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>£1,210</td>
<td>164</td>
<td>122</td>
<td></td>
</tr>
<tr>
<td>% central outpatients appointments</td>
<td>15%</td>
<td>0%</td>
<td>-</td>
<td>515</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>-</td>
<td>147</td>
<td>136</td>
<td></td>
</tr>
<tr>
<td>Cost-effectiveness threshold (/QALY)</td>
<td>£20,000</td>
<td>£30,000</td>
<td>-</td>
<td>346</td>
<td>87</td>
</tr>
</tbody>
</table>
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**Table 3.3  Sensitivity analysis for varicose veins trade-offs**

<table>
<thead>
<tr>
<th></th>
<th>Old value</th>
<th>New value</th>
<th>Cost / QALY</th>
<th>Min cost per month</th>
<th>Max months per QALY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BASE CASE</strong></td>
<td>-</td>
<td>-</td>
<td>£187,000</td>
<td>£499</td>
<td>40</td>
</tr>
<tr>
<td><strong>Utility differences</strong></td>
<td>0.09</td>
<td>0.06</td>
<td>£344,000</td>
<td>£527</td>
<td>38</td>
</tr>
<tr>
<td>(asymptomatic-baseline)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.12</td>
<td></td>
<td>£129,000</td>
<td>£472</td>
<td>42</td>
</tr>
<tr>
<td><strong>Cost of private surgery</strong></td>
<td>£1895</td>
<td>£1500</td>
<td>£121,000</td>
<td>£302</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>£2300</td>
<td>£255,000</td>
<td>£702</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cost-effectiveness</strong></td>
<td>£20,000</td>
<td>£30,000</td>
<td>-</td>
<td>£470</td>
<td>64</td>
</tr>
<tr>
<td><strong>threshold (/QALY)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

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Table 3.4  QALY gains per lifetime quitter by age and sex

<table>
<thead>
<tr>
<th>Age</th>
<th>QALY (0%) discounting</th>
<th>QALY (3%) discounting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This study</td>
<td>FF</td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 20-24</td>
<td>6.6</td>
<td>1.9</td>
</tr>
<tr>
<td>Age 25-29</td>
<td>6.2</td>
<td>6.6</td>
</tr>
<tr>
<td>Age 30-34</td>
<td>5.8</td>
<td>6.1</td>
</tr>
<tr>
<td>Age 35-39</td>
<td>5.3</td>
<td>5.5</td>
</tr>
<tr>
<td>Age 40-44</td>
<td>4.7</td>
<td>4.8</td>
</tr>
<tr>
<td>Age 45-49</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Age 50-54</td>
<td>3.2</td>
<td>3.1</td>
</tr>
<tr>
<td>Age 55-59</td>
<td>2.5</td>
<td>2.3</td>
</tr>
<tr>
<td>Age 60-64</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Age 65-69</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Age 70-74</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Age 75-79</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Age 80-84</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Age 85-89</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Age 90-94</td>
<td>0.0</td>
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Table 3.4  QALY gains per lifetime quitter by age and sex (continued)

<table>
<thead>
<tr>
<th>Women</th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Age 20-24</td>
<td>6.3</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Age 25-29</td>
<td>6.2</td>
<td>6.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Age 30-34</td>
<td>6.0</td>
<td>6.3</td>
<td>1.7</td>
</tr>
<tr>
<td>Age 35-39</td>
<td>5.7</td>
<td>5.9</td>
<td>1.8</td>
</tr>
<tr>
<td>Age 40-44</td>
<td>5.3</td>
<td>5.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Age 45-49</td>
<td>4.8</td>
<td>4.8</td>
<td>1.9</td>
</tr>
<tr>
<td>Age 50-54</td>
<td>4.2</td>
<td>4.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Age 55-59</td>
<td>3.5</td>
<td>3.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Age 60-64</td>
<td>2.7</td>
<td>2.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Age 65-69</td>
<td>1.9</td>
<td>1.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Age 70-74</td>
<td>1.2</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>Age 75-79</td>
<td>0.7</td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>Age 80-84</td>
<td>0.4</td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td>Age 85-89</td>
<td>0.2</td>
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<td>0.1</td>
</tr>
<tr>
<td>Age 90-94</td>
<td>0.0</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>Age 95-99</td>
<td>0.0</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>Age 100</td>
<td>0.0</td>
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<td>0.0</td>
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</tbody>
</table>

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Table 3.5  Sensitivity analysis for smoking cessation

<table>
<thead>
<tr>
<th></th>
<th>Old value</th>
<th>New value</th>
<th>Difference in net benefit</th>
<th>High se group threshold (max £ per QALY)</th>
<th>Low se grp threshold (min £ per QALY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE CASE</td>
<td>-</td>
<td>-</td>
<td>£1,455</td>
<td>£15,643</td>
<td>£24,357</td>
</tr>
<tr>
<td>CE Threshold (per QALY)</td>
<td>£20,000</td>
<td>£30,000</td>
<td>£2,188</td>
<td>£23,447</td>
<td>£36,553</td>
</tr>
<tr>
<td>QALYs benefits (both groups)</td>
<td>0.204, 0.130</td>
<td>0.185, 0.149</td>
<td>£722</td>
<td>£17,839</td>
<td>£22,161</td>
</tr>
<tr>
<td>Monthly NRT cost</td>
<td>37</td>
<td>0</td>
<td>£1,459</td>
<td>£15,608</td>
<td>£24,392</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td></td>
<td>£1,451</td>
<td>£15,656</td>
<td>£24,344</td>
</tr>
</tbody>
</table>
Section 7 References


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Centers for Disease Control and Prevention. 2005. 00/04/10 Table 290: Cause of Death Code, Race, Sex and Year. All causes, 1979-98. Atlanta: CDC.


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### Section 8  Glossary of acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Automobile Association</td>
</tr>
<tr>
<td>AAA</td>
<td>abdominal aortic aneurysm</td>
</tr>
<tr>
<td>AHRB</td>
<td>Arts and Humanities Research Board</td>
</tr>
<tr>
<td>BD</td>
<td>base data</td>
</tr>
<tr>
<td>BUPA</td>
<td>British United Provident Association</td>
</tr>
<tr>
<td>BWS</td>
<td>best-worst scaling</td>
</tr>
<tr>
<td>CABG</td>
<td>coronary artery bypass graft</td>
</tr>
<tr>
<td>CDC</td>
<td>Center for Disease Control</td>
</tr>
<tr>
<td>CE</td>
<td>carotid endarterectomy</td>
</tr>
<tr>
<td>CMO</td>
<td>Chief Medical Officer</td>
</tr>
<tr>
<td>DCE</td>
<td>discrete choice experiment</td>
</tr>
<tr>
<td>DoH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>ENT</td>
<td>ear, nose and throat</td>
</tr>
<tr>
<td>EQ-5D</td>
<td>EuroQol 5-dimensional measure of health outcome</td>
</tr>
<tr>
<td>ESRC</td>
<td>Economic and Social Research Council</td>
</tr>
<tr>
<td>FCE</td>
<td>finished consultant episode</td>
</tr>
<tr>
<td>GP</td>
<td>general practitioner</td>
</tr>
<tr>
<td>HAZ</td>
<td>Health Action Zone</td>
</tr>
<tr>
<td>HCHS</td>
<td>hospital and community health staff</td>
</tr>
<tr>
<td>HDU</td>
<td>high dependency unit</td>
</tr>
<tr>
<td>HES</td>
<td>health episode statistics</td>
</tr>
<tr>
<td>HRG</td>
<td>health care resource group</td>
</tr>
<tr>
<td>HTA</td>
<td>Health Technology Assessment</td>
</tr>
<tr>
<td>ICER</td>
<td>incremental cost-effectiveness ratio</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>IV</td>
<td>in vivo</td>
</tr>
<tr>
<td>MP</td>
<td>Member of Parliament</td>
</tr>
<tr>
<td>MRI</td>
<td>magnetic resonance imaging</td>
</tr>
<tr>
<td>MRS</td>
<td>marginal rate of substitution</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>NICE</td>
<td>National Institute for Clinical Excellence</td>
</tr>
<tr>
<td>NRT</td>
<td>nicotine replacement therapy</td>
</tr>
<tr>
<td>NSF</td>
<td>National Service Framework</td>
</tr>
<tr>
<td>PC</td>
<td>pairwise comparison</td>
</tr>
<tr>
<td>PCT</td>
<td>Primary Care Trust</td>
</tr>
<tr>
<td>PVD</td>
<td>peripheral vascular disease</td>
</tr>
<tr>
<td>QALY</td>
<td>quality adjusted life year</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>research and development</td>
</tr>
<tr>
<td>RAWP</td>
<td>Resource Allocation Working Party</td>
</tr>
<tr>
<td>RMSE</td>
<td>root mean square error</td>
</tr>
<tr>
<td>SDO</td>
<td>Service Delivery and Organisation</td>
</tr>
<tr>
<td>SHA</td>
<td>Strategic Health Authority</td>
</tr>
<tr>
<td>SSS</td>
<td>Stop Smoking Services</td>
</tr>
<tr>
<td>VSSGBI</td>
<td>Vascular Surgical Society of Great Britain and Ireland</td>
</tr>
</tbody>
</table>
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Addendum

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The management of the Service Delivery and Organisation (SDO) programme has now transferred to the National Institute for Health Research Evaluations, Trials and Studies Coordinating Centre (NETSCC) based at the University of Southampton. Prior to April 2009, NETSCC had no involvement in the commissioning or production of this document and therefore we may not be able to comment on the background or technical detail of this document. Should you have any queries please contact sdo@southampton.ac.uk.