Preferences for access to the GP:
a discrete choice experiment

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ABSTRACT

Background
Access to primary care services is one of the key components of the *NHS Plan* which states that patients should be able to see a health professional with 24 hours and a GP with 48 hours. However, it is not clear how patients value speed of access in comparison with other aspects of primary care.

Aim
To investigate patient preferences when making an routine appointment for a GP, and to describe the trade-offs and relationships between speed of access, choice of time and choice of doctor in different patient groups.

Design of study
Discrete choice experiment.

Setting
Adults consulting a GP in six general practices in Sunderland

Method
Choice sets based on three attributes (time to appointment, choice of time, choice of doctor) were presented in a self-completion questionnaire.

Results
We obtained 6985 observations from 1153 patients. We found that the waiting time to make an appointment was only important if the appointment is for a child or when attending for a new health problem. Other responders would trade-off a shorter waiting time and be willing to wait in order to either see their own choice of doctor or attend an appointment at their own choice of time. For responders who work, choice of time is six times more important than a shorter waiting time and they are willing to wait up to 1 day extra for this. Those with a long-standing illness value seeing their own GP more than seven times as much as having a shorter waiting time for an appointment and will wait an extra 1 day for an appointment with the GP of their choice, women will wait an extra 2 days, and older patients an extra 2.5 days.

Conclusion
Speed of access is of limited importance to patients accessing their GP, and for many is outweighed by choice of GP or convenience of appointment.

Keywords
access; discrete choice experiment; general practitioner.

INTRODUCTION

Access to primary care services is a key component of the *NHS Plan*,[1] which states that patients should be able to see a health professional within 24 hours and a GP within 48 hours. Substantial NHS investment has been directed in the past 5 years to improving access and the proportion of practices meeting this target has increased year on year. Nevertheless, waiting times in general practice remain a public and political concern.[2] In a 2005 survey for the NHS, patients continued to complain of having to wait longer than they wished for an appointment and of difficulty obtaining appointments at a convenient time.[3]

Access has been defined as the fit between the patient and the healthcare system,[4] and as a multidimensional concept embracing not just availability but also utilisation, relevance, effectiveness and equity.[5] The concept of access is also considered to apply to the 'in-system' experience as much as to entry to health care.[6] As a result, the NHS model of access has been criticised as simplistic[7] even by those responsible for its implementation,[8] while patients and carers seek flexibility in its interpretation to allow a wider range of choices.[9] A robust evidence base informed by the needs and priorities of patients and utilising better methodologies and instruments has been called for.[10,11]

A discrete choice experiment is a method of eliciting preferences that allows estimation of the

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How this fits in

Access to GPs is a public and political concern. Government policy is focused on improving speed of access, although patients are known to also value continuity of care and convenience. The weighting given to these aspects of access varies between patient groups, but in general patients value seeing the doctor of their choice above speed of access. This is particularly true for older patients, women and those with a long-standing physical condition.

relative importance of different aspects of care, the trade-offs between these aspects and the total satisfaction or utility that responders derive from healthcare services.[12] It is used by economists for health services research because it reflects the type of decisions people make in daily life.[13] In one small study of patient preferences for appointment making, which used this technique, time to appointment was the most important attribute, followed by length of wait in the waiting room and choice of doctor.[13]

We used a discrete choice experiment to estimate the relative importance to patients of three attributes (time to appointment, choice of time, choice of doctor) in making a routine appointment to see a GP.

METHOD

We followed the stepped approach previously described by Ryan and Farrar.[12]

Step 1. Identifying attributes and levels

Through a review of the existing literature and discussion with patients and members of the local primary care collaborative, we identified three attributes as important when making a routine appointment for a GP and we assigned plausible levels to each of these (Table 1).

Table 1. Attributes and levels included in the study.

Attribute	Levels	Regression coding
Time to appointment	Same day	0
	Within 48 hours	2
	In 4 days	4
	In 10 days	10
Choice of doctor	Your choice of time	1
	At a specified time	0
Choice of time	Your choice of doctor	1
	With any available doctor	0

Box 1. Example of a discrete choice experiment choice.

For each of the following situations, imagine you have telephoned for a ROUTINE, NON-URGENT PROBLEM. You are given two choices, A or B. Place a cross in one box only.

A		B
• In 4 days		• Within 48 hours
• With any available doctor ☐	OR	• Your choice of doctor ☐
• Your choice of time		• At a specified time

Step 2. Designing choice sets

This number of attributes and levels, gives rise to a complete set of 16 (4x2x2) possible combinations (or profiles) which, when paired with one another, result in 120 choice sets (excluding duplicate choices). For the purposes of this study and orthogonal design of 21 choice sets were selected by excluding choices where one profile clearly dominated the other (that is, was better on all levels for each attribute). In this case we assumed that the less time to appointment, own choice of doctor, and own choice of time would be the preferred options.

Step 3. Obtaining preferences for choice sets

Choices were presented in a self-completion questionnaire (Box 1 for sample choice). Participants were asked to make their choices in the context of telephoning for an appointment to discuss a routine non-urgent problem, and to express their preference for each pair presented.

Three versions of the questionnaire, each containing seven choice pairs, were constructed. This was done in order to present participants with a reasonable number of choices that could be completed while waiting for their appointment. Two of the questionnaires also included choices where one option dominated the other on some attributes (while other attributes were held equal) in order to identify non-traders, who were defined as those failing both dominant questions in their questionnaire. The questionnaires also asked for basic demographic information and contained previously validated items on reason for appointment.[14] The questionnaire was piloted for comprehension and ease of completion on 63 patients from a single practice. It was mailed to the same patients 1 week later to establish test-retest stability.

The three versions of the questionnaire were randomly distributed to participating practices, to be given to all patients aged 18 years and over attending for appointments on each day and for each session for a 1- or 2-week period. On completion, participants returned their forms to a drop box in the reception area, from where they were collected at the end of each surgery. Practices were asked to provide data on the number of doctors working at each practice, practice list size and time to third available appointment (a measure of appointment availability).

Step 4. Statistics and data analysis

There is no single accepted method for calculating sample size in discrete choice experiments. However, given a sampling frame of six GP practices and a time frame of 2 weeks we anticipated recruiting 1500 patients, giving a maximum possible total of 10 500 observations (1500x7).

Data were managed in SPSS and analysed using the statistical package STATA 8.0. Within the discrete choice experiment framework, it is assumed that if A is preferred to B then the utility or benefit derived from choosing A (with a given set of attributes and levels) will be greater than that of B (with a given set of attributes and levels) (equation 1: see Supplementary Information). We can only observe this indirectly (that is, through the choices made) as the difference in utility between the two choices and their associated attribute levels (equation 2: see Supplementary Information).

We used both fixed and random effects (to account for the fact that individuals provided multiple responses) probit regression models to analyse responder's choice of preferred appointment (either choice A or B) as the dependent variable. A linear additive utility model was specified (equation 3: see Supplementary Information).

In addition to analysing the main effects (the three main attributes) specified in equation 3, it was hypothesised that individual characteristics, such as socioeconomic variables, would also influence preference for a GP appointment. We chose to include variables for sex, working/educational status and age. Despite stating the context in which the choices should be made, we also hypothesised that responders' preferences would be contextualised by their current experience and therefore included variables for who was attending the appointment, the reason for attendance, and the number of whole-time equivalent GPs in the practice. Including these effects in the analysis minimises the effects of any biases that would otherwise be present in the regression result estimates.

Given that these characteristics do not differ between each choice and they simply drop out of the equation (equation 2: see Supplementary Information), they were entered into the model analysis through interactions with the main effects (Table 2 and equation 4: see Supplementary Information). The segmented model included all main and interaction effects. To create a more parsimonious model, this was reduced stepwise by excluding insignificant main and interaction effects one at a time using $P>0.05$.

The β coefficient values derived from regression equation 4 (see Supplementary Information) were used to estimate the relative importance of attributes (the significance and sign of the coefficient value) and the trade-offs responders would be willing to make between them (the marginal rate of substitution [MRS] calculated by dividing the respective coefficient values of the attributes in question). In this case we calculated the marginal rate of substitution values using the 'time to appointment' attribute as the denominator so that responder's preferences and the trade-offs could be compared on a common value scale in terms of 'willingness to wait' (formula 1 see Supplementary Information).

RESULTS

Six practices participated, with a total list of 41 817 (range = 3774–12 998) patients and a mean of 3.1 GPs (range = 1–7) per practice. The time to third available appointment ranged from 1–3 days, median = 1 day. There were 1246 responses, of which 93 were excluded, 43 from patients aged <18 years and 50 where no choice had been made. The overall response rate was 55.2% (range 32.1% to 89.0%). The 1153 usable responses gave rise to 6985 observations.

Responder and practice characteristics

Responders were aged 18–90 years (mean =

Table 2. Interaction effects.

Individual characteristics	Regression code	Parameter
Sex		Z1
Male	0	
Female	1	
Work/educational status		Z2
In work or full-time education	1	
Not in work or full-time education	0	
Age in years (18–30 = base case)		
18–30	0	
31–50	1 if yes	Z3
51–60	1 if yes	Z4
61–70	1 if yes	Z5
>70	1 if yes	Z6
Person attending (you = base case)		
Yourself	0	
Child under 5 years of age	1 if yes	Z7
Another adult (or older child)	1 if yes	Z8
Reason for attendance (none = base case)		
None	0	
Emergency	1 if yes	Z9
New or urgent physical health problem	1 if yes	Z10
Long-standing physical health problem	1 if yes	Z11
Emotional or psychological problem	1 if yes	Z12
Social or administrative problem	1 if yes	Z13
Action of advice to keep healthy	1 if yes	Z14
Number of WTE doctors in practice (>4 = base case)		
Single practice	1 if yes	Z15
2 to 4 doctors	1 if yes	Z16
>4 doctors	0	

WTE = work-time equivalent.

46.15 years, standard deviation = 16.42) and 66.6% were female. Five hundred and twenty-nine (45.0%) were working or in full-time education; 58 (5%) were attending with a child under 5 years; and 71 (6.2%) were attending for someone else. Two hundred and eighteen (18.9%) had an emergency appointment and 346 (30%) had been asked to attend by a doctor. Most patients were planning to discuss either a long-standing physical problem or new or urgent physical problem (Table 3).

Tests for dominant preference

There were a total of 59 responders who failed both of the dominance tests presented in two versions of the questionnaire. Given that there is no standard guidance in the literature on how to handle those with seemingly 'dominant' preferences,[15] we ran the regression model twice, including and excluding these responders. Exclusion of these responders did not result in any significant difference in the model and they were therefore included in the analysis. The following results are therefore based on the full set of complete responses.

Main effects model

The fixed effects and random effects models produced similar coefficients, suggesting that the regressions were relatively stable. The results presented are for the random effects model only (Table 4). The coefficient results indicate that the attributes 'time to appointment' and 'choice of doctor' are significant in responder's preferences for choice of appointment. On the other hand, the attribute 'choice of time' is not. Given the attribute coding used in the regression equation, the sign on the coefficients for these attributes indicates that responders prefer their own choice of doctor and to wait fewer days.

Table 3. Reasons for attendance.

Which would like to discuss with doctor today	*n*	%
A new or urgent physical health problem	461	40.0
A long-standing physical health problem	441	38.2
An emotional/psychological problem	104	9.0
A social/administrative problem	54	4.7
Action or advice to keep you healthy	89	7.7
No response	174	15.1
More than one box ticked	144	12.5

Table 4. Random effects probit model (main effects only).

Attribute (regression coding)	β coefficient	(SE)
Time to appointment (days)	-0.115[a]	(0.003)
Choice of doctor (own choice 1, any 0)	0.407[a]	(0.023)
Choice of time (own choice 1, specified 0)	0.038	(0.025)
Constant	-0.025	(0.022)
Log likelihood	-3872.217	
Number of observations	6985	
Number of individuals	1153	
Pseudo R^2	0.175[b]	

[a]P<0.001. [b]McFaddens R^2=1-(log likelihood of main effects model/log likelihood of the null model). SE = standard error.

Segmented model

The goodness of fit test (Pseudo R^2) shows that the segmented model with interaction terms is a better fit than the main effects model. The coefficient results from the reduced model are presented in Table 5.

The coefficient results on the main effects indicate that the attributes 'time to appointment' and 'choice of doctor' are significant in responder's preferences for choice of appointment with responders again preferring their own choice of doctor and to wait fewer days for an appointment. From the coefficient results for the segmented model, the extent of these preferences varies by group and the attribute 'choice of time' is only significant for certain groups of people. Selected findings for the segmented analysis are interpreted in the following sections.

Time to appointment (speed of access)

The sign of the coefficients and the regression coding used indicate that patients consulting for a new health problem, a long-standing health problem; those attending the appointment for a child under 5 years of age, or another person; and those who work, would prefer a shorter waiting time for a hypothetical routine appointment. This is the most important variable for those consulting with a child under 5 years and those attending with a new health problem. For others, comparing the marginal rate of substitution indicates that other attributes are more important (for example, for those who work choice of time (MRS = 0.77) is six times more important than time to appointment (MRS = 0.12)).

Choice of doctor

The sign of the coefficients and the regression coding used indicate that older patients, females and those with long-standing physical illness prefer to see their own choice of GP for a hypothetical routine appointment and they are willing to wait longer to do so. For older patients this becomes increasingly more so after the fifth decade, with those aged >70 years willing to wait up to an extra 2.5 days to see their own choice of GP (MRS = 2.39). Females would wait up to an extra 2 days for an appointment with their own choice of GP (MRS = 1.71). Only those

patients attending as an emergency express a preference to see any GP.

Choice of time

The sign of the coefficients and the regression coding used indicate that for those who work or who have an appointment for someone other than themselves (excluding a child under 5 years), having their own choice of appointment time is preferred to being allocated a time for a hypothetical routine appointment. This is the most important attribute for both of these groups and they are willing to wait longer for an appointment if it is at their own choice of time. Responders consulting about another person are willing to wait up to an extra 1.5 days for their own choice of appointment time.

DISCUSSION

Summary of main findings

This is the first large-scale study to quantify preferences for access to the GP. Specifically we used 'willingness to wait' as a measure of value to compare these trade-offs. For a hypothetical routine appointment we found that, while responders do prefer shorter waiting times to see a GP, this is outweighed in many cases by their preference for choice of time and seeing their own choice of doctor which they value more. In particular, seeing their own choice of doctor is especially important for women, the elderly and those with long-standing physical illnesses, while choice of time is important for those who work.

Strengths and limitations of the study

We conducted the study in a diverse group of practices over a short period of time. This makes it unlikely that any patient responded more than once. The number of responses obtained is large compared to many discrete choice experiments in health care and there was a high degree of completion for a self-administered questionnaire.

The study was conducted in a single primary care trust characterised by generalised deprivation. We confined ourselves to preferences relating to a routine appointment with the GP, although practice nurses also provide first contact care and manage chronic diseases in the participating practices, while for urgent appointments speed of access would be expected to be dominant. The population under study was that attending general practice, while alternative options for first contact care, such as urgent care centres, are becoming a feature of primary care services. Studies of preferences for access that embrace these alternative providers of primary health care are currently being undertaken.[16] Participation in the study was an intensive experience for already busy practice reception staff who, on occasions, failed to hand a questionnaire to every patient attending. The overall response rate was further affected by a particularly low response rate (32%) in one of the largest practices. We did not collect demographic data on non-participants and do not know whether responders differed systematically from non-responders. Lastly, the responses collected were to a hypothetical situation and our interpretation assumes that these would be consistent with actual choices. This is consistent with recent research findings which have reported favourable results on the external validity of discrete choice experiments.[17]

Table 5 Segmented random effects probit model (reduced model).

Variable	β coefficient	(SE)	Willingness to wait (days) (MRS)
Days to appointment	0.0993[c]	(0.0072)	-
Choice of doctor	0.1491[b]	(0.0494)	0.9075
'Time to appointment'			
New problem x days to appointment	-0.0159[a]	(0.0073)	0.0968
Long-standing physical problem x days to appointment	-0.0204[a]	(0.0074)	0.1241
Psychological problem x days to appointment	0.0313[a]	(0.0111)	0.1905
Appointment for a child x days to appointment	-0.0364[a]	(0.0169)	0.2215
Appointment for another person x days to appointment	-0.0408[a]	(0.0149)	0.2483
Working x days to appointment	-0.0212[b]	(0.0069)	0.1290
Age 61–70 x days to appointment	0.0384[c]	(0.0102)	0.2337
'Choice of time'			
Emergency appointment x choice of time	-0.1467[a]	(0.0601)	0.8929
Appointment for another person x choice of time	0.2426[a]	(0.1072)	1.4766
Working x choice of time	0.1268[b]	(0.0387)	0.7717
'Choice of doctor'			
Sex x choice of doctor	0.2818[c]	(0.0490)	1.7152
Emergency appointment x choice of doctor	-0.2238[c]	(0.0597)	1.3621
Long-standing physical problem x choice of doctor	0.1541[b]	(0.0504)	0.9379
Age 51–60 x choice of doctor	0.1622[a]	(0.0634)	0.9872
Age 61–70 x choice of doctor	0.2278[b]	(0.0753)	1.3865
Age >70 x choice of doctor	0.3930[c]	(0.0977)	2.3919
Log likelihood		-3549.5281	
Number of observations		6614	
Number of individuals		1080	
Pseudo R^2		0.244[d]	

[a]P<0.05, [b]P<0.005, [c]P<0.001. [d]McFaddens R^2. MRS = marginal rate of substitution. SE = standard error.

Comparison with existing literature

Discrete choice experiments are increasingly used in healthcare research, and have successfully addressed patient and community preferences in the delivery of healthcare services, preferences for priority setting among consultants, optimal

treatments and the doctor–patient relationship.[11,18] Discrete choice experiments have been previously used to investigate patient preferences for access to the GP. In a small study of 51 patients, nested within a randomised controlled trial of a patient health card and intended to demonstrate the strength of the methodology, Ryan *et al* found that waiting time was more important than choice of doctor.[12] In contrast, patient willingness to trade speed of access for choice of doctor has been described in a telephone survey of 658 US adults. When asked about seeing an alternate physician for an acute, non-threatening medical condition, 42% would wait 1 day or more, and 10% would not see another physician.[19] The practices in our study performed well on a standard measure of speed of access (time to third available appointment) and consequently their patients may not have valued quick access so highly as those in Ryan's study. Patients also place greater weight on relational and informational continuity than on speed of access, and will wait an extra 3.5 days to see a GP rather than a nurse when they have worrying problems or are attending for routine care.[20] In a secondary care study, patients attending a rheumatology department valued the introduction of a pain management service above a 9-week reduction in waiting.[21]

Implications for policy and future research

These findings demonstrate that the current focus of the NHS on speed of access to a GP is over-simplified. Developments to improve access in primary care should be based on a broader conceptual framework, one that takes account of the more complex preference of patients for access to appropriate care, integrating speed, involvement in the consultation and personal continuity.[22]

Primary care trusts are developing, as a priority, new models of access to primary care, including urgent care centres, walk-in centres and specialist chronic disease teams. There is a pressing need to understand how sub-sets of the patient population value these alternatives in comparison to GP services. Discrete choice experiments allow us to estimate the weighting given to attributes of service, and we have shown that these will differ between patient groups. Within general practice, the value to specific patient groups of telephone consultations, triage and nurse-led chronic disease management are all amenable to this method of investigation.

Supplementary information

Additional information accompanies this article at http://www.rcgp.org.uk/bjgp-suppinfo

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Ethical approval

This study was approved by Sunderland LREC (SLREC 1021) and Sunderland TPCT (SPCT/RP/03/005)

Competing interests

The authors have stated that there are none

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REFERENCES

1. Department of Health. *NHS Plan.* London: Department of Health, 2002.
2. Anonymous. GP appointment crisis 'not good enough'. *Daily Mail* 2005: 7 September. http://www.dailymail.co.uk/pages/live/articles/health/healthmain.html?in_article_id=361568&in_page_id=1774 (accessed 25 Aug 2006).
3. Healthcare Commission. *Primary care trusts: survey of patients 2005.* London: Commission for Healthcare Audit and Inspection, 2005.
4. Pechansky R, Thomas W. The concept of access: definition and relationship to consumer satisfaction. *Med Care* 1981; **19:** 127–140.
5. Chapman JL, Zechel A, Carter YH, Abbott S. Systematic review of recent innovations in service provision to improve access to primary care. *Br J Gen Pract* 2004; **54:** 374–381.
6. Rosen R, Florin D, Dixon J. *Access to health care — taking forward the findings from the scoping exercise.* London: The Kings Fund, 2002.
7. RCGP & NHS Alliance. *The future of Access to general practice-based primary medical care: informing the debate.* London: RCGP, 2004.
8. Brittain KR, Rubin G, Pearson P, Gillen K. *Modernising care outside hospital: primary care access.* Report for the Tyne and Wear and Northumberland Health Action Zones. Sunderland: University of Sunderland, 2002.
9. Windridge K, Tarrant C, Freeman G, *et al.* Problems with a 'target' approach to access in primary care: a qualitative study. *Br J Gen Pract* 2004; **54:** 364–366.
10. Gulliford M, Morgan M, Hughes D, *et al. Access to health care. Report of a scoping exercise for the National Co-ordinating Centre for NHS Service Delivery and Organisation R&D (NCCSDO).* London: NCCSDO 2001
11. Ryan M, Watson V. Counting the cost of fast access: using discrete choice experiments to elicit preferences in general practice. *Br J Gen Pract* 2006; **56:** 4–5.
12. Ryan M, Farrar S. Using conjoint analysis to elicit preferences for health care. *BMJ* 2000; **320:** 1530–1533.
13. Ryan M, McIntosh E, Shackley P. Using conjoint analysis to elicit the views of health service users: an application to the patient health card. *Health Expect* 1999; **1:** 117–129.
14. Howie JGR, Heaney DJ, Maxwell M, *et al.* Quality at general practice consultations: cross sectional survey. *BMJ* 1999; **319:** 738–743
15. Lancsar E, Louviere J. Deleting 'irrational' responses from discrete choice experiments: a case of investigating or imposing preferences? *Health Econ* 2006; **15:** 797–811.
16. National Research Register. An evaluation of Advanced Access in general practice. http://www.nrr.nhs.uk/ViewDocument.asp?ID=N0536160711 (accessed 25 Aug 2006).
17. Ryan M, Gerard K, Currie G. Using discrete choice experiments in health economics. In: Jones A (ed.). *The Elgar companion to health economics.* Cheltenham: Edward Elgar Publishing, 2006: 405–414.
18. Longo MF, Cohen DR, Hood K, *et al.* Involving patients in primary care consultations: assessing preferences using discrete choice experiments. *Br J Gen Pract* 2006; **56:** 35–42.
19. Love MM, Mainous AG III. Commitment to a regular physician: how long will patients wait to see their own physician for acute illness? *J Fam Pract* 1999; **48:** 202–207.
20. Turner D, Boulton M, Freeman G, *et al.* Continuity in primary care: a stated preference discrete choice experiment. *Fam Pract* 2005; **22(Suppl 1):** 20.
21. Ryan M, Major K, Skatun D. Using discrete choice experiments to go beyond clinical outcomes when evaluating clinical practice. *J Eval Clin Pract* 2005; **11:** 328–338.
22. Guthrie B, Wyke S. Personal continuity and access in UK general practice: a qualitative study of general practitioners' and patients' perceptions of when and how they matter. *BMC Fam Pract* 2006; **7:** 11.