

**Public preferences for GP consultation for perceived cancer risk:  
a discrete choice experiment.**

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## **ABSTRACT**

**Background:** Contacting a doctor for advice when experiencing a potential cancer symptom is an important step in earlier diagnosis, but barriers to consultation are commonly reported.

**Aim:** To investigate patients' GP consultation preferences when presented with a potential cancer symptom, and to describe whether these preferences are mediated by variable levels of cancer risk.

**Design and setting:** UK-wide online survey of adults over 50 years old, using quota sampling to reflect general population characteristics.

**Method:** A discrete choice experiment examined preferences for primary care consultation for three cancer symptom scenarios (risk level not mentioned, risk designated as either "low" or "high"). Scenarios based on length of consultation, time to getting an appointment, convenience, choice of GP and GP listening skills were presented in a self-completed online questionnaire.

**Results:** We obtained 9616 observations from 601 participants. Participants expressed preferences for doctors with better listening skills, for ability to see a GP of their choice and for shorter waiting times. These findings were the same across risk conditions and demographic groups. Participants were willing to wait an extra 3.5 weeks for an appointment with a doctor with good/very good listening skills (vs very poor listening skills) and an extra 1 week for an appointment with a GP of their choice (vs any GP).

**Conclusion:** Patient decisions about help-seeking seem to be particularly influenced by the anticipated listening skills of doctors. Improving doctor's communication skills may in the longer term encourage people to seek prompt medical help when they experience a cancer symptom.

**Key words:** cancer, primary health care, symptoms, decision making, health services research.

## **HOW THIS FITS IN**

Prompt consultation in primary care when people experience a potential cancer symptom is considered key to earlier diagnosis. Several factors are known to influence consulting, however, it is not clear how the public weigh up these factors. This study used a discrete choice experiment to explore preferences for GP consultation using different cancer symptom scenarios. Listening skills of the doctor was a key driver of preference; improving communication within consultations is likely to encourage help-seeking longer-term.

## **INTRODUCTION**

More than half of the UK population will be diagnosed with some form of cancer during their lifetime.<sup>1</sup> Prompt presentation with cancer symptoms could help to improve clinical outcomes in some, and patient experience in nearly all patients.<sup>2,3</sup> International comparison surveys indicate that respondents in the UK more often reported barriers to seeing their primary care doctor than in other countries with similar healthcare systems.<sup>4</sup> Therefore understanding barriers to consulting in primary care within the cancer context provides opportunities to improve earlier diagnosis of cancer.<sup>2</sup> (See Box 1).

Against this background, we hypothesise that psychosocial, clinician and system factors may all contribute to how long a patient waits between noticing a cancer symptom and making an appointment with a healthcare professional. In this study, we use a discrete choice experiment (DCE) to better understand the trade-offs that patients are willing to make when making an appointment for a cancer symptom. DCEs will allow us to understand which aspects of service delivery are most important to patients, and suggest the aspects of a health service which are likely to result in the greatest reductions in time to help-seeking were they to be addressed.<sup>13</sup>

Discrete choice experiments (DCEs) can be utilised to understand consultation preferences and are based on the principle that services can be described in terms of a set of attributes (e.g. type of healthcare professional), which can take on one of several levels (e.g. any GP, GP of your choice). DCE participants are asked to state their preferences in a choice between a number of options of attributes with different levels (e.g. same day/any GP vs. 10 days/ GP of your choice); and statistical modelling is used to calculate which attributes are valued and to what extent.<sup>13</sup>

This study elicited public preferences for different consultation options within the context of experiencing a cancer symptom. We also explored whether these consultation preferences varied by cancer risk based on existing evidence suggesting the influence of perceived symptom seriousness on consultation preferences.<sup>13</sup> Finally, we examined whether participant characteristics (e.g. age, cancer experience) influenced consultation preferences,<sup>14</sup> with the aim of adding depth to our results that could be useful for policy-makers.

## **METHOD**

### *Discrete choice experiment*

DCE guidelines were followed for study design and analysis.<sup>15-17</sup> Detailed information about the DCE design is provided in Appendix 1.

### *Sample and recruitment*

Data were collected from a sample of the general population aged 50 years and over who did not have a current diagnosis of cancer. Participants were members of an online research panel (Survey Sampling International, SSI), and the questionnaire was emailed to members of the panel in November 2015. Participants were purposively sampled to match the general population with regards to age, education and gender in accordance with census data.<sup>18</sup>

### *Attributes and attribute levels*

Based on findings of previous research,<sup>11,13,14</sup> including our work focused on help-seeking for cancer symptoms,<sup>10,19</sup> we chose five attributes of primary care consultations, namely: length of consultation (minutes), time to getting an appointment (weeks), convenience of appointment (during normal working hours or not), choice of GP (ability to see a GP of their choice or any GP) or GP listening skills (how good the doctor is at listening to you). The levels of attributes were chosen based on previous research (Figure 1(a)).<sup>11,13,14</sup>

### *Questionnaire design*

The questionnaire comprised five sections: (1) a question determining eligibility; (2) structured questions about general health; (3) DCE scenarios; (4) perceived difficulty completing the DCE (5) questions on experience of cancer; and, (6) demographic questions. For the DCE scenarios each respondent was asked to make eight separate choices, and for each choice was asked to choose one of two options, that varied by the levels of the attributes.

We developed three vignettes that varied according to cancer risk; risk level not mentioned, or designated as “low risk” or “high risk” (Table 1). We chose descriptive, qualitative labels (e.g. “low risk”) to avoid questionnaire burden associated with explaining percentage risk because quantitative information may lead to varying interpretation in different individuals.<sup>20</sup> Participants were randomly assigned to one of the three risk scenarios.

A factorial design was used to reduce the number of possible scenarios to sixteen (see Appendix 1 for details). As it was considered overly burdensome for a single respondent to complete all 16 choices they were split into two sets of eight choices, and the respondents were randomly assigned to receive one of these.

We aimed to recruit 600 participants. Although no consensus exists regarding sample size calculation for DCEs due to their complexity (e.g. number of attributes, levels),<sup>21</sup> this sample size is similar to previous studies.<sup>22</sup> Three hundred participants were randomly assigned to each set of scenarios, and 100 participants in each scenario set were randomly assigned to each risk scenario.

With each choice participants were asked ‘Which consultation sounds best to you?’ (Figure 1 (b)). We did not include a ‘neither’ option because we were not interested in consultation uptake but rather modelling preference structures.

The survey included questions regarding demographics, smoking status (‘Yes, I am a current smoker’, ‘Not now, but I used to smoke’ and ‘No, I have never smoked’), and previous cancer experience: ‘Have you or any family members or close friends, ever been diagnosed with cancer?’ (‘Myself, Parent/brother/sister/child, Other family member, Close friend, Prefer not to say and None of the above’). All participants were asked to rate how easy/difficult they found the scenarios to complete, and were given the opportunity to provide free-text comments on the survey.

### *Statistical analysis*

The DCE preference data were analysed using a conditional logit regression model where the outcome was consultation preference (A or B) and the variables in the equation were the individual attributes (e.g. time to consultation). Detailed information about the analysis is presented in Appendix 1.

We ran three groups of conditional logit regression models. First, we first ran the model on the whole sample. Second, we ran another group of models stratifying participants according

to risk scenario. Third, we ran eight groups of models stratifying participants separately according to demographic characteristics including sex, age, education, ethnic group, marital status, employment status, smoking status; previous personal history of cancer. In the second and third cases we tested for differences in preferences between the stratified groups using  $\chi^2$  tests.

We used the regression results to calculate the probability that different types of consultation (defined in terms of the attributes and levels) would be selected. We then ranked them in order of preference by these probabilities, so consultations with higher probability appeared higher in the ranking and were preferred by study participants.<sup>16</sup> To do this we used the 32 types of consultation used in the DCE.

To determine the trade-offs participants were willing to make between the attributes, the marginal rates of substitution (MRS) were calculated as a ratio of the coefficients of two attributes. The MRS allows direct assessment of how much of one attribute participants are willing to trade for one unit of another attribute and enables a comparison of different attributes on a common scale.<sup>16</sup> In this case we calculated the MRS values using the 'waiting time to appointment' attribute as the denominator so that participant's preferences and the trade-offs could be compared on a common value scale in terms of 'willingness to wait'. For ease of interpretation the MRS was computed for statistically significant variables, using dummy-coded variables.

All analyses were undertaken using the software package Stata 12.0 (StataCorp USA). Other analyses involved descriptive statistics on single items included in the questionnaire including age, education, ethnicity, marital status, employment, smoking status and personal history of cancer.

## **RESULTS**

### *Participants*

The DCE was completed by 658 people without a current diagnosis of cancer (aged  $\geq 50$  years). Fifty-seven were excluded because they failed quality checks: seven were excluded because they completed the DCE section in less than 50 seconds; 46 were excluded because responses to the first practice question were irrational,<sup>23</sup> and four were excluded because they failed the quality control question related to age (by providing two inconsistent age answers). Hence, the final sample consisted of 601 participants. Demographic characteristics are presented in Table 2.

The large majority of the 601 participants found the discrete choice scenarios easy (291; 48%) or very easy (240; 40%) to complete, with a smaller proportion reporting they found the section difficult (68; 11%) or very difficult (2; 0.3%). The open text comments also did not reveal any concerns about the DCE. Most people (>80%) did not provide specific feedback, but words such as “interesting” or “good” were commonly used to describe the survey.

#### *Influence of consultation characteristics (Main effects model)*

The coefficient results (Table 3) indicated that the attributes ‘time to getting an appointment’, ‘choice of GP’ and ‘listening skills’ were statistically significant in participants’ preferences for a GP consultation. ‘Length of consultation’ and ‘convenience of appointment’ were not.

Given the attribute coding used in the regression equation, the sign on the coefficients for the significant attributes indicates that participants preferred consultations with shorter waiting times, with the ability to see their choice of GP, and with very good (vs very poor) listening skills (all  $p < .001$ ).

#### *Influence of cancer risk and socio-demographic characteristics*

There were no statistically significant differences in preferences between participants assigned to each of the three risk scenarios (Table 4). There were also no statistically significant variations in consultation preferences by participant sub-groups, including, age, education, ethnicity, marital status, employment status, smoking status and previous personal history of cancer (all  $p > 0.05$ ; results not shown).

#### *Order of preferences*

Consultations for the total sample were ranked in order of preference by calculating the mean probability of choosing a given consultation (Table 5). Consultations at the top of the table are the most preferred, and consultations at the bottom of the table are the least preferred consultation. For example, the highest ranking consultation was 20 minutes long, 1 week waiting time from phone call to appointment, that could be at ‘anytime’ with a GP of their choice who has very good listening skills. However, although listening skills are highly valued by participants, even consultations with a doctor who has good listening skills moves down the ranking table if this is accompanied by long waiting times (4 weeks), lack of convenience (within working hours only) and without a choice of GP.

### *Willingness to wait trade-offs*

Calculation of the marginal rates of substitution identified the magnitude of participants' preference for a GP with good listening skills, and seeing a GP of their choice (Table 3). Participants were prepared to wait around three and a half weeks for a GP with very good or good listening skills compared with seeing a GP with very poor listening skills. They were prepared to wait around one week to see a GP of their choice compared with having no choice.

## **DISCUSSION**

### *Summary*

We explored people's preferences for consulting a GP when considering a potential cancer symptom. Participants preferred to see a GP of their choice, a GP with good listening skills and be able to access timely appointments. Length of consultation and convenience of appointment did not influence people's preferences. Participant's preferences did not vary by risk of cancer symptom, and there were no other socio-demographic associations. People were willing to trade shorter waiting times with having a consultation with a doctor who was good at listening to them and (to a lesser extent) the ability to see a GP of their choice, further reinforcing the importance of good listening skills in the context of anticipated help-seeking for potential cancer symptoms. Patients may be more likely to feel that they are being taken seriously by a doctor who appears to listen, and are therefore willing to wait for the opportunity for their concerns to be addressed.

### *Strengths and weaknesses*

Our study used a novel methodological approach to study a combination of primary care attributes for consulting with a GP regarding a cancer symptom. Specifically, DCE allows preferences and trade-offs of real-life choices to be examined, aspects which would otherwise be difficult to explore systematically in the research setting. We also adjusted for possible confounding of symptom experience (e.g. severity), although it was not possible to measure actual behaviour. However, several studies in healthcare have used symptom scenarios to explore people's anticipated behaviour (e.g. medical help-seeking),<sup>8</sup> and responses to vignettes are considered useful as proxies for behaviour.<sup>24</sup> We made assumptions about who were 'valid' completers (i.e. those who passed the three validity checks) but we cannot be certain that all completers provided meaningful answers. Overall, it is reassuring that we only had to exclude a small number (8%) of people for being irrational, suggesting that people were willing and able to weigh up the attributes.



Using an online survey panel for recruitment may have resulted in a sample of people who may not have been representative of the general population. However, using quota sampling to match population characteristics, helped mitigate this. We also report similar findings to studies recruiting through primary care,<sup>13,14</sup> which lends weight to the validity of our approach.

Another potential limitation relates to the use of risk scenarios in exploring people's preferences for consultations. Although previous evidence supports the finding that varying risk does not necessarily influence patient<sup>25</sup> and GP decisions,<sup>26</sup> we cannot be certain that participants were using the risk information to make their judgements. The concept of risk may be difficult to convey in hypothetical scenarios, as perceived risk may be affected by various factors such as prior knowledge and experience. Quantifying the contribution of these factors to risk perception is challenging but by pre-specifying a risk level for the scenarios, we may have helped mitigate the effects of personal/subjective experiences on risk perception and subsequent decision-making.

#### *Comparison with existing literature*

The finding that patients would like to see their own choice of doctor is in line with previous studies exploring patient preferences for accessing healthcare,<sup>14 11</sup> Relational continuity of care promotes security and trust, which can motivate patients to seek help.<sup>27</sup> Our DCE extends these findings by including listening skills of the doctor, which recent research has identified as a key factor influencing patient preferences;<sup>11</sup> it was also one of the most important attributes in our study.

The finding that participants were willing to trade off speed of access for continuity of care has been reported before, where patients were willing to wait five days (comparable to seven days in the present study) longer to see a doctor of their choice for an acute, low-worry symptom.<sup>28</sup> However, the trade-off between waiting time and listening skills has not been explored previously, and we found a marked increase in how long people were willing to wait to obtain a consultation with a doctor who had good listening skills (over three weeks). This finding may be counter-intuitive, especially for a serious symptom which may be due to cancer, but highlights the importance of the clinician factors that may facilitate help-seeking.

Although patients were willing to wait longer to see a GP of their choice or a GP with good listening skills, a shorter waiting time was still a statistically significant driver of people's preferences in the present study. This supports previous research which found a preference for shorter waiting times across all symptoms (from mild to severe).<sup>13</sup>

Access to consultations in terms of convenience of appointment, and longer consultations, did not influence preferences in the present study, contradicting other DCE research. For example, others have found convenience of appointment to be more important than speed of access.<sup>14</sup> The variations in preferences for healthcare system factors may be due to the differences in scenarios studied with respect to clinical severity (e.g. cancer vs non-cancer symptoms) and urgency (e.g. acute vs chronic symptoms). These differences may also relate to the use of an older sample in the present study, as older patients may have less constraints on their own time (e.g. 67% of our sample were not working). Further research is needed to explore how and why preferences for system factors (such as consultation length) differ for different populations.

#### *Implications for policy and practice*

Health policy in England has focused on improving access to services but our findings highlight that in the context of experiencing a possible cancer symptom, people are willing to trade speed of access for better interpersonal skills of the doctor. It may therefore be possible to promote help-seeking by improving doctors' communication skills. Conversely, this means that negative experiences of communicating with the doctor may put people off seeking help promptly.

As well as promote prompt help-seeking, good listening skills are likely to aid the elicitation of symptoms, which is critical for arriving at an appropriate management plan.<sup>29</sup> This step is fundamental to the initiation of the diagnostic process, especially in reducing the likelihood of missed diagnostic opportunities in primary care.<sup>26</sup> For example, recent evidence suggests that a significant proportion of patients diagnosed with colorectal cancer as emergency had three or more primary care consultations with relevant symptoms prior to diagnosis, suggesting possible opportunities for earlier diagnosis.<sup>30</sup> This supports recent cancer recognition and referral guidelines from the National Institute of Health and Care Excellence (NICE), which advocate open and honest conversations between patients and GPs.<sup>31</sup> Future research should aim to understand more about communication within the patient-GP consultation in order to identify aspects of communication skills that can be optimised so that interventions can be developed to reduce barriers to consultation in patients with possible cancer.

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## REFERENCES

1. Cancer Research UK. Lifetime risk of cancer. <http://www.cancerresearchuk.org/health-professional/cancer-statistics/risk/lifetime-risk>. 2016; Last accessed 24/10/2016.
2. Hiom SC. Diagnosing cancer earlier: reviewing the evidence for improving cancer survival. *Br J Cancer*. 2015;**112(s1)**:S1-S5.
3. Mendonca SC, Abel GA, Saunders CL, Wardle J, Lyratzopoulos G. Pre-referral general practitioner consultations and subsequent experience of cancer care: evidence from the English Cancer Patient Experience Survey. *Eur J Cancer Care*. 2016;**25**:478-490.
4. Forbes L, Simon A, Warburton F, et al. Differences in cancer awareness and beliefs between Australia, Canada, Denmark, Norway, Sweden and the UK (the International Cancer Benchmarking Partnership): do they contribute to differences in cancer survival? *Br J Cancer*. 2013;**108(2)**:292-300.
5. Macleod U, Mitchell ED, Burgess C, Macdonald S, Ramirez AJ. Risk factors for delayed presentation and referral of symptomatic cancer: evidence for common cancers. *Br J Cancer*. 2009;**101**:S92-S101.
6. Smith LK, Pope C, Botha JL. Patients' help-seeking experiences and delay in cancer presentation: a qualitative synthesis. *Lancet*. 2005;**366(9488)**:825-831.
7. Forbes L, Warburton F, Richard MA, Ramirez A. Risk factors for delay in symptomatic presentation: a survey of cancer patients. *Br J Cancer*, . 2014;**111**:581-588.
8. Robb K, Stubbings S, Ramirez A, et al. Public awareness of cancer in Britain: a population-based survey of adults. *Br J Cancer*. 2009;**101**:S18-S23.
9. Niksic M, Rachet B, Warburton FG, Wardle J, Ramirez AJ, Forbes L. Cancer symptom awareness and barriers to symptomatic presentation in England-are we clear on cancer? *Br J Cancer*. 2015;**113(3)**:533-542.

10. Cromme SK, Whitaker KL, Winstanley K, Renzi C, Smith CF, Wardle J. Worrying about wasting GP time as a barrier to help-seeking: a community-based, qualitative study. *Br J Gen Pract.* 2016;DOI: 10.3399/bjgp16X685621
11. Paddison CAM, Abel GA, Roland MO, Elliott MN, Lyratzopoulos G, Campbell JL. Drivers of overall satisfaction with primary care: evidence from the English General Practice Patient Survey. *Health Expect.* 2015;**18(5)**:1081-1092.
12. Aboulghate A, Abel G, Elliott MN, et al. Do English patients want continuity of care, and do they receive it? *Br J Gen Pract.* 2012;**62(601)**:e567-575.
13. McAteer A, Yi D, Watson V, et al. Exploring preferences for symptom management in primary care: a discrete choice experiment using a questionnaire survey. *Br J Gen Pract.* 2015;**65(636)**:e478-488.
14. Rubin G, Bate A, George A, Shackley P, Hall N. Preferences for access to the GP: a discrete choice experiment. *Br J Gen Pract.* 2006;**56(531)**:743-748.
15. Ryan M, Gerard K, Amaya-Amaya M. *Using Discrete Choice Experiments to Value Health and Health Care.* AA Dordrecht, The Netherlands: Springer; 2008.
16. Lancsar E, Louviere J. Conducting discrete choice experiments to inform healthcare decision making: a user's guide. *PharmacoEconomics.* 2008;**26(8)**:661-677.
17. Bridges JF, Hauber AB, Marshall D, et al. Conjoint analysis applications in health--a checklist: a report of the ISPOR Good Research Practices for Conjoint Analysis Task Force. *Value Health.* 2011;**14(4)**:403-413.
18. ONS. Census 2011 <http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/index.html>. 2011.
19. Whitaker KL, Macleod U, Winstanley K, Scott S, Wardle J. Help-seeking for cancer 'alarm' symptoms: a qualitative interview study. *Br J Gen Pract.* 2015;**65(631)**:e96.
20. Hsee CK. The Evaluability Hypothesis: An Explanation for Preference Reversals between Joint and Separate Evaluations of Alternatives. *Organ Behav Hum Dec.* 1996;**67(3)**:247-257.
21. Amaya-Amaya M, Gerard K, Ryan M. Discrete Choice Experiments in a Nutshell. In: Ryan M, Gerard K, Amaya-Amaya M, eds. *Using Discrete Choice Experiments to Value Health and Health Care.* AA Dordrecht, The Netherlands: Springer; 2008:13-46.
22. Ghanouni A, Halligan S, Taylor SA, et al. Quantifying public preferences for different bowel preparation options prior to screening CT colonography: a discrete choice experiment. *BMJ Open.* 2014;**4(4)**.
23. San Miguel Inza F, Gerard K, Amaya-Amaya M. "Irrational" Stated Preferences. A quantitative and qualitative investigation. . In: Ryan M, Gerard K, Amaya-Amaya M, eds. *Using Discrete Choice Experiments to Value Health and Health Care.* AA Dordrecht, The Netherlands: Springer; 2008:195-215.

24. Peabody JW, Luck J, Glassman P, Dresselhaus TR, Lee M. Comparison of vignettes, standardized patients, and chart abstraction: a prospective validation study of 3 methods for measuring quality. *JAMA*. 2000;**283(13)**:1715-1722.
25. Banks J, Hollinghurst S, Bigwood L, Peters TJ, Walter FM, Hamilton W. Preferences for cancer investigation: a vignette-based study of primary-care attendees. *Lancet Oncol*. 2014;**15(2)**:232-240.
26. Sheringham Jea. Variations in GPs' Decisions to Investigate Suspected Lung Cancer: A Factorial Experiment Using Multimedia Vignettes. *BMJ Qual Saf*. 2016; doi: 10.1136/bmjqs-2016-005679. .
27. Freeman G, Hughes J. Continuity of care and the patient experience. [http://www.kingsfund.org.uk/sites/files/kf/field/field\\_document/continuity-care-patient-experience-gp-inquiry-research-paper-mar11.pdf](http://www.kingsfund.org.uk/sites/files/kf/field/field_document/continuity-care-patient-experience-gp-inquiry-research-paper-mar11.pdf). 2010;Last accessed 08/10/2016.
28. Gerard K, Salisbury C, Street D, Pope C, Baxter H. Is fast access to general practice all that should matter? A discrete choice experiment of patients' preferences. *J Health Serv Res Policy*. 2008;**13**:3-10.
29. Jensen H, Topping M, Olesen F, Overgaard J, Vedsted P. Cancer suspicion in general practice, urgent referral and time to diagnosis: a population-based GP survey and registry study. *BMC Cancer*. 2014;**14(1)**:636.
30. Renzi C, Lyratzopoulos G, Card T, Chu TP, Macleod U, Rachet B. Do colorectal cancer patients diagnosed as an emergency differ from non-emergency patients in their consultation patterns and symptoms? A longitudinal data-linkage study in England. *Br J Cancer*. 2016;**115(7)**:866-875.
31. National Institute for Health and Care Excellence. Suspected cancer: recognition and referral. <https://www.nice.org.uk/guidance/NG12/chapter/Introduction>. Last accessed 24/10/2016. 2015.

### Box 1 Factors known to affect consulting in primary care

-Worry about wasting doctor's time consistently highlighted as a barrier to help-seeking by cancer patients,<sup>5-7</sup> and the general public,<sup>8,9</sup> and awareness of long waiting times exacerbates feelings of time-wasting.<sup>10</sup>

-Difficulty making an appointment reported both in population surveys and qualitative interview studies with people reporting 'alarm' symptoms.<sup>8-10</sup>

- In the English General Practitioner Patient Survey (GPPS) communication with the doctor is the most important driver of overall satisfaction with primary care.<sup>11</sup>

-Two-thirds of English patients have a preference for seeing a specific doctor, also known as interpersonal or relational continuity of care.<sup>12</sup>

**Figure 1. DCE design**

*(a) Attributes and levels used in the DCE*

Attributes	Levels			
Length of consultation	10 minutes	20 minutes		
Time to getting an appointment (waiting time)	Same day	1 week	4 weeks	
Convenience	Any time	Normal working hours only		
Choice of GP	GP of your choice	Any GP		
Listening skills	Very good	Good	Poor	Very poor

*(b) Example of DCE scenario (for low risk condition)*

We would like you imagine that you have decided to go and see the GP about a symptom you've had for the last 6 weeks that you are worried might be cancer. With this symptom there is a low risk of cancer

<b>Attributes</b>	Consultation A	Consultation B
How long the allocated timeslot for your appointment is	10 minutes	20 minutes
How long you need to wait to get an appointment (i.e. from calling to book an appointment to the date of the appointment)	1 week	4 weeks
What time of the day and week the appointment is	Any time	Normal working hours only
Which GP you will see	GP of your choice	Any GP who is available
How good the GP is at listening to you	Very good	Good

Which consultation sounds best to you?

Consultation A

Consultation B



**Table 1 Vignettes associated with risk scenarios**

<b>Risk scenario</b>	<b>Vignette</b>
Risk level not mentioned	We would like you imagine that you have decided to go and see the GP about a symptom you've had for the last 6 weeks that you are worried might be cancer
Low risk	We would like you imagine that you have decided to go and see the GP about a symptom you've had for the last 6 weeks that you are worried might be cancer. With this symptom there is a low risk of cancer
High risk	We would like you imagine that you have decided to go and see the GP about a symptom you've had for the last 6 weeks that you are worried might be cancer. With this symptom there is a high risk of cancer

**Table 2 Demographic characteristics (n=601).**

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	[n (%)]
<b>Gender</b>	
Male	300 (50.0)
Female	301 (50.0)
<b>Age</b>	
50-59	250 (41.6)
60-69	229 (38.1)
70+	122 (20.3)
<b>Education</b>	
No formal qualifications	170 (28.3)
Lower than degree	338 (56.2)
Degree level	93 (15.5)
<b>Ethnicity</b>	
White British	592 (98.5)
Other	6 (1.0)
Prefer not to say	3 (0.5)
<b>Marital status</b>	
Married	388 (64.6)
Not married	213 (35.4)
<b>Employment</b>	
Working	199 (33.1)
Not working	402 (66.9)
<b>Smoking status</b>	
Current smoker	144 (24.0)
Former smoker	215 (35.8)
Never smoked	242 (40.3)
<b>Personal history of cancer</b>	
Yes	276 (45.9)
No	325 (54.1)
<b>Self-rated health</b>	
Poor	65 (10.8)
Fair	233 (38.8)
Good /Excellent	303 (50.4)

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**Table 3 Conditional logit analysis regression results for total sample**

		Effects coded <sup>a</sup>	Dummy coded <sup>a</sup>	Willingness to wait for an appointment (weeks)
Attribute	Level	Coefficient (95% CI)	Coefficient (95% CI)	MRS
Length of consultation	(minutes)	0.001 (-0.007 to 0.008) <sup>b</sup>	0.001 (-0.007 to 0.008) <sup>b</sup>	
Waiting time	(weeks)	-0.540 (-0.584 to -0.496)	-0.540 (-0.584 to -0.496)	
Convenience/availability	Normal working hours only	-	-	
	Anytime	0.041 (-0.003 to 0.085) <sup>b</sup>	0.083 (-0.002 to 0.167) <sup>b</sup>	
Healthcare professional	Any GP	-	-	
	GP of your choice	0.244 (0.204 to 0.283)	0.487 (0.403 to 0.571)	0.902 = (-0.487/-0.540)
Listening to you	Very poor	-	-	
	Poor	-0.678 (-0.781 to -0.575)	0.359 (0.206 to 0.511)	0.665 = (-0.359/-0.540)
	Good	0.845 (0.758 to 0.933)	1.882 (1.739 to 2.025)	3.485 = (-1.882/-0.540)
	Very good	0.870 (0.773 to 0.966)	1.906 (1.728 to 2.085)	3.530 = (-1.906/-0.540)

CI = confidence interval. MRS = marginal rate of substitution. Number of observations = 601. Pseudo-R2 = 0.4283.

<sup>a</sup> In the case of effects coding the coefficients show the effect of each variable relative to the grand mean. With dummy coding of categorical variables, the coefficients show the effect relative to the omitted category (Appendix 1).

<sup>b</sup> Coefficient not significantly different from zero; all other coefficients significant at  $p < 0.001$ .

**Table 4 Conditional logit regression analysis by risk group (effects coded)**

		Risk level not mentioned <sup>a</sup>	Low risk <sup>b</sup>	High risk <sup>c</sup>	
Attribute	Level	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)	P value <sup>e</sup>
Length of consultation	(minutes)	-0.002 (-0.017 to 0.012) <sup>d</sup>	0.004 (-0.011 to 0.020) <sup>d</sup>	0.001 (-0.014 to 0.015) <sup>d</sup>	0.83
Waiting time	(weeks)	-0.578 (-0.641 to -0.516)	-0.531 (-0.591 to -0.472)	-0.516 (-0.575 to -0.457)	0.13
Convenience/availability	Normal working hours only	-	-	-	
	Anytime	0.013 (-0.065 to 0.092) <sup>d</sup>	0.083 (0.007 to 0.160)	0.026 (-0.047 to 0.099) <sup>d</sup>	0.40
Healthcare professional	Any GP	-	-	-	
	GP of your choice	0.191 (0.118 to 0.263)	0.309 (0.234 to 0.385)	0.237 (0.162 to 0.311)	0.08
Listening to you	Very poor	-	-	-	
	Poor	-0.698 (-0.890 to -0.506)	-0.634 (-0.827 to -0.440)	-0.717 (-0.909 to -0.525)	0.82
	Good	0.864 (0.695 to 1.031)	0.831 (0.670 to 0.994)	0.849 (0.686 to 1.012)	0.96
	Very good	0.762 (0.603 to 0.923)	0.973 (0.809 to 1.138)	0.8894 (0.737 to 1.050)	0.19
Joint test <sup>f</sup>					0.48
Overall joint test <sup>g</sup>					0.18

CI = confidence interval.

<sup>a</sup> Number of observations = 205. Pseudo-R<sup>2</sup> = 0.4309.

<sup>b</sup> Number of observations = 200. Pseudo-R<sup>2</sup> = 0.4503.

<sup>c</sup> Number of observations = 196. Pseudo-R<sup>2</sup> = 0.4115.

<sup>d</sup> Coefficient not significantly different from zero; all other coefficients significant at p<0.001.

<sup>e</sup>  $\chi^2$  test that coefficients are equal across risk groups within every level.

<sup>f</sup> Joint  $\chi^2$  test that every coefficient is equal across the risk groups within every level of this attribute.

<sup>g</sup> Joint  $\chi^2$  test that every coefficient is equal across the risk groups within every level of every attribute.

**Table 5 Order or preference probability analyses showing the ranked order of scenarios based on the mean predicted probability of participants selecting them.**

<b>Ranking</b>	<b>Mean predicted probability</b>	<b>Length of consultation</b>	<b>Time from phone call to appointment</b>	<b>Convenience</b>	<b>Healthcare professional</b>	<b>Listening to you</b>
1	0.9746	20 minutes	1 week	Any time	GP of your choice	Very good
2	0.9739	20 minutes	1 week	Any time	GP of your choice	Good
3	0.9724	10 minutes	Same day	Working hours	Any GP	Very good
4	0.9582	20 minutes	Same day	Working hours	Any GP	Good
5	0.9493	20 minutes	Same day	Working hours	GP of your choice	Very good
6	0.8966	20 minutes	Same day	Any time	Any GP	Poor
7	0.8957	10 minutes	1 week	Any time	GP of your choice	Very good
8	0.8760	10 minutes	1 week	Working hours	GP of your choice	Good
9	0.8540	10 minutes	Same day	Any time	GP of your choice	Good
10	0.7650	20 minutes	Same day	Any time	GP of your choice	Poor
11	0.7107	10 minutes	1 week	Any time	Any GP	Good
12	0.6642	10 minutes	Same day	Working hours	GP of your choice	Very poor
13	0.6237	10 minutes	4 weeks	Any time	GP of your choice	Very good
14	0.5512	10 minutes	1 week	Working hours	GP of your choice	Poor
15	0.5322	20 minutes	4 weeks	Working hours	GP of your choice	Good
16	0.4678	10 minutes	Same day	Any time	Any GP	Very poor
17	0.4488	20 minutes	Same day	Any time	Any GP	Very poor
18	0.3763	20 minutes	1 week	Working hours	Any GP	Poor
19	0.3358	20 minutes	4 weeks	Any time	Any GP	Good
20	0.2893	20 minutes	Same day	Working hours	GP of your choice	Very poor
21	0.2466	20 minutes	1 week	Working hours	Any GP	Very good
22	0.2350	10 minutes	4 weeks	Working hours	Any GP	Very good
23	0.1240	20 minutes	4 weeks	Any time	Any GP	Very good
24	0.1043	20 minutes	4 weeks	Working hours	Any GP	Good
25	0.1034	10 minutes	4 weeks	Working hours	GP of your choice	Very poor
26	0.0507	10 minutes	1 week	Any time	Any GP	Very poor
27	0.0454	20 minutes	1 week	Working hours	Any GP	Very poor
28	0.0418	10 minutes	4 weeks	Any time	GP of your choice	Poor
29	0.0276	20 minutes	4 weeks	Any time	GP of your choice	Very poor
30	0.0257	10 minutes	4 weeks	Working hours	Any GP	Poor