This is the final draft, after peer-review, of a manuscript published in Value in Health vol 15, no. 8, pp. 1069-1076. [ONLINE] **DOI: 10.1016/j.jval.2012.06.013. The definitive version is available online at www.sciencedirect.com**

ABSTRACT

Background: To design cost-effective health services it is important to understand why people adopt particular symptom management strategies. *Aim:* To establish the relative importance of factors that influence decision-making when managing symptoms of differing severity, how people trade between these factors, and to estimate the monetary value placed on different management-types. *Design:* Discrete choice experiment. *Setting:* UK online research panel.

Method: Successive members of an online panel were invited to participate until 480 discrete choice experiment questionnaires were completed. Relative preferences for managing three symptom scenarios of varying severity were measured. Symptom management was described by three characteristics (management-type, availability and cost). Preferences for ways of managing symptoms were measured using conditional logit analysis.

Results: A total of 98.5% of completed questionnaires were valid (473/480 respondents). People preferred to manage minor symptoms by self-care or by visiting a pharmacy, and were willing to pay £21.58 and £19.06 respectively to do so. For managing moderately severe symptoms people preferred to consult a GP and were willing to pay £34.86 for this option. People preferred to manage potentially very severe symptoms by consulting a GP and were willing to pay £73.08 to do so. Respondents were willing to trade between management-types; options less preferred became more attractive when waiting time and cost were reduced.

Conclusion: People value self-care, supported self-care and GP consultation differently depending on type of symptom. Manipulating costs to users and waiting times for different services could allow policy makers to influence the services people choose when managing symptoms.

Introduction

It is generally acknowledged that demand for primary healthcare in the United Kingdom (UK) is increasing beyond the provision of available resources [1]. Strategies to help manage demand include increasing government spending on healthcare [2] and developing new services in addition to general practice such as NHS walk-in centres, telephone/internet services (www.nhsdirect.nhs.uk; www.nhs24.com), and community pharmacy Minor Ailment Services [3]. One aim of such services is to increase availability of GP appointments for more serious cases. However, a significant proportion of GP consultations still involve minor illnesses that could be managed without GP intervention [4-6], and demand for appointments continues to increase annually [7].

The UK Government and National Health Service (NHS) promote self-care [8,9]. By encouraging people to take personal responsibility for their health, some demand for health care can be met at a personal level [10] and scarce NHS resources can be preserved. Existing services such as community pharmacies and NHS telephone/internet services can support self-care, with the added advantage of readily available professional advice for cases requiring further investigation. The success of these services in managing demand for primary care will partly depend on the public's willingness to use them. It is crucial that people with more serious symptoms recognise when it is appropriate to seek medical help.

Applying economic methods to elicit healthcare-users' preferences informs the rationing of healthcare by means that satisfy demand [11,12]. At present, there is a lack of information regarding the trade-offs people make in managing moderate and serious symptoms. A discrete choice experiment (DCE), a survey-based technique described previously, was used successfully in 2005 to measure preferences for managing symptoms of minor illness [13]. People preferred to manage self-limiting, flu-like symptoms by self-care or, where advice was needed, by consulting a pharmacist or GP. Other options (e.g. NHS help line, complementary therapy) were significantly less preferred. This study expanded the original experiment to establish people's preferences for managing symptoms of

differing severity. Our *a priori* expectations were that preferences would differ depending on symptom severity and that health professional advice would be valued more highly for more severe symptoms.

Method

The DCE method presents individuals with hypothetical choice-sets described in terms of attributes and associated levels. Attribute levels are varied systematically between choice-sets to create different options. Respondents choose their preferred option within each choice-set. Regression analysis yields information on the relative importance of attributes and indicates how respondents trade between them [14].

Development of the experimental design has been described previously [13]. In the current study, the 72 choice-questions used to collect preference data were almost identical to those used in 2005 and included three attributes: management-type, availability and cost. However, compared to 2005, levels of the "cost" attribute were increased and covered a wider range (Box 1), reflecting our expectation that some management-types would be valued more highly for more severe symptoms.

Three hypothetical symptom scenarios were developed in consultation with two practising GPs; one minor, one more severe but likely to be self-limiting, and one potentially very severe (Box 2). To ensure perceived severity of the scenarios was as intended, a convenience sample of non-medical individuals rated their likelihood of consulting a GP for each. For the majority, diarrhoea was the least likely and rectal bleeding the most likely symptom for which they would consult.

The 72 choice-questions were allocated to eight blocks of nine questions using SAS statistical software (version 8). Allocation was performed in such a way that each block maintained the statistical properties of the original design. Box 3 shows a sample choice-question. Blocks were repeated three times per questionnaire, once for each of the symptom scenarios. A tenth choice-question was included with each set of nine to check consistency of responses [13]; thus, three consistency tests were included for each respondent. Failing one test was deemed acceptable due to

random error; respondents failing more were excluded from the regression analysis. Definitions of the attributes and a worked example of a choice-question to illustrate the task were provided. Demographic, lifestyle and other descriptive data were also collected (questionnaire available from authors).

Based on econometric criteria [14], we aimed to survey a minimum of 50 people per block, increased by 20% to compensate for any exclusion due to invalid responses (480 participants in total). The self-completed survey was administered online in February 2010, hosted by a professional survey company [15]. Non-leading invitations to complete the survey were issued to members of an online panel that was managed by the survey company. Based on demographic data, routinely collected for all panel members, quota sampling was used to ensure respondents were nationally representative in terms of age, gender and household income (Table 1). A further quota was applied to 'block number' to ensure comparable numbers of respondents in each of the eight blocks of the DCE design. The company continued to contact panel members until the required number of respondents had been achieved (480 completed questionnaires). As part of the survey company's rolling incentive scheme, panellists received a £0.75 participation reward. Responses were anonymous and participants could withdraw at any stage. The survey company collected all data and delivered it in SPSS (Version 17).

Data were transferred to STATA (Version SE 10.1) for analysis. Choice data (excluding consistency questions) were analysed using conditional logit regression, allowing for clustering due to multiple observations from individuals. "Self-care" was the reference category for "management-type" (the only categorical variable). Willingness-to-pay for marginal changes in attribute levels was estimated (the ratio of the management-type and (negative of) the cost coefficients). Ninety-five per cent confidence intervals were used to compare willingness-to-pay for management-type across symptoms; no overlap indicated a significant difference. Utility scores were calculated to compare preferences for different models of care.

Results

Respondents' characteristics are shown in Table 1. No respondent failed three consistency tests but

seven failed two and were excluded; the analysis included data from 98.5% (473/480) of respondents. Table 2 shows the conditional logit regression results.

Positive constants for the three symptoms indicate a preference for doing “something” to manage each symptom (rather than doing nothing) where that “something” is self-care. Positive coefficients for different management-types indicate increased utility (respondents preferred that management-type above self-care). Negative coefficients indicate decreased utility relative to self-care, e.g. the coefficient for GP consultation to manage diarrhoea was negative (-0.50, $p<0.001$), indicating that respondents significantly preferred self-care to GP consultation. Coefficient magnitude indicates the degree of preference. Coefficients for “availability” and “cost” were theoretically valid; significantly negative values indicate that respondents preferred waiting less time and paying less money.
Figure 1 shows willingness-to-pay (and 95% confidence intervals) for each management-type and for each symptom scenario. Self-care and pharmacy advice were the most favoured management-types for minor (diarrhoea) symptoms with no significant statistical difference between the two ($p=0.062$). Respondents were willing to pay £21.58 to self-care and £19.06 for pharmacy advice; both were preferred over GP consultation ($p<0.001$), valued at £13.42. There was no statistically significant difference between GP consultation and NHS24/Direct telephone advice ($p=0.46$) or practice nurse advice ($p=0.2$). Respondents were willing to pay £11.61 to see a nurse and £12.28 for NHS24/Direct advice. Complementary therapy was the least preferred management-type valued at £3.12.
GP consultation was preferred for managing moderate (back pain) symptoms ($p<0.001$) valued at £34.86. Practice nurse advice was preferred second to GP advice ($p<0.001$, £26.30) and above self-care ($p=0.02$, £22.31). There was no statistically significant difference between self-care and pharmacy advice ($p=0.51$, £23.35) or NHS24/Direct telephone advice ($p=0.18$, £21.19). Complementary therapy was again least preferred (£15.97).

The preferred option for managing potentially severe symptoms (rectal bleeding) was GP consultation ($p<0.001$) valued at £73.08. Practice nurse advice was preferred less than seeing a GP ($p<0.001$, £56.69) but above NHS24 advice ($p<0.001$, £48.31). Telephoning NHS24/Direct was preferred above

pharmacy advice ($p<0.001$, £41.39). Self-care (£22.99) and complementary therapy (£18.76) were the least preferred options.

There was no significant difference in willingness-to-pay values for self-care between all three symptoms (Fig. 1). When managing back pain, respondents were willing to pay significantly more to see a GP, consult a nurse, see a complementary therapist, or telephone NHS24/Direct than they would when managing diarrhoea. To manage rectal bleeding, respondents were willing to pay significantly more for pharmacy advice, consulting a GP, seeing a practice nurse and NHS24/Direct advice when compared with managing back pain symptoms.

To reduce waiting time (to manage symptom) by one day, respondents were willing to pay £4, £2.34 and £2.77 to manage rectal bleeding, back pain and diarrhoea symptoms respectively, however there was no significant difference between these values ($p>0.05$).

Trade-offs between attributes can be demonstrated using utility scores (V), calculated using the equation:

$$V = \beta_{(constant)} + \beta_{(management\text{-}type)} + (\beta_{(availability)}).availability + (\beta_{(cost)}).cost$$

For example, the utility associated with waiting seven days to see a GP to manage rectal bleeding at a cost of £15 is calculated as:

$$V = 0.91 + (1.98) + 7(-0.16) + 15(-0.040) = \underline{\underline{1.17}}$$

The positive utility score indicates respondents prefer this model over doing nothing. An alternative model, seeing a practice nurse after a reduced wait of one day at a cost of £15, generates a higher utility score of 1.49. Thus, whilst when all other things are equal GP advice is preferred over practice nurse advice for rectal bleeding, the reduced waiting time compensates for seeing the (less preferred) practice nurse.

Discussion

Summary of main findings

A priori expectations were confirmed. Preferences for managing minor symptoms echoed previous research [13]. For the most severe symptoms there was a general preference for health professional advice (except from a complementary therapist) over self-care. Preferences for, and the value of, consulting a GP increased with increasing symptom severity. Implicit in the concept of severity is the negative effect respondents experience as a consequence of the uncertainty and associated anxiety about their future health state. This will be different across the three scenarios; more severe symptoms are likely to be associated with greater uncertainty/anxiety. Such uncertainty could help to explain the observed preference for GP consultation for symptoms of rectal bleeding.

With respect to trade-offs, people were willing to trade between the different management options for each symptom-type; even for the most severe symptoms, less preferred management-types became more desirable when the waiting time and cost of managing symptoms were reduced.

Complementary therapy was consistently the least preferred management-type.

Strengths and limitations of the study

This is the first published study using a DCE to compare, within the same respondents, the relative importance of some of the factors that influence decision-making when managing symptoms of differing severity. Furthermore, it has been demonstrated that people are prepared to trade between these factors.

To guarantee an adequate response rate we used an online panel, therefore, participants may not be representative of the general population or those accessing primary care services. Additionally, we were unable to estimate the extent of potential response bias from those subscribing to the online research panel because drop-out and non-participation rates were not provided by the survey company.

Whilst DCEs present useful policy relevant information, they rely on the assumption that respondents behave in reality as they say in the DCE questionnaire. Very little work has investigated the external validity of responses to DCEs [12]. Watson and Ryan [16] found that values generated from a DCE concerned with valuing a Chlamydia screening programme were only slightly higher than the real price of a screening test from the pharmacy (once introduced). This finding gives validity to the DCE technique since the market may not be extracting maximum willingness-to-pay. Furthermore, Ryan and Watson [17] found that 80% of participants responded to the real offer of a screening test in a manner consistent with their responses to the hypothetical questions i.e. said yes (or no) to both hypothetical and real choices. This suggests respondents' answers are consistent with their actual behaviour, but further work is required to establish why 20% of respondents gave different answers. Our willingness-to-pay estimates for self-care and supported self-care have some face validity because we know that some people regularly purchase expensive OTC medicines that could be obtained less expensively on prescription (e.g. statins, proton pump inhibitors, anti-fungal preparations). Establishing external validity of estimates for GP and nurse consultations, however, is difficult since in the UK these services are usually free at the point of consumption. Further work is needed to address this issue.

Comparison with existing literature

This research provides evidence of how preferences change when managing different symptoms of varying perceived severity. Previous DCEs applied to health care also found that self-care was the preferred management-type for symptoms of minor illness [13] and that reduced waiting time was an important preference for the provision of out-of-hours services [18]. Willingness-to-pay for self-care of minor symptoms in this study (diarrhoea, £21.58) was similar to our previous findings (flu-like symptoms, £22.62) [13].

In 2005, NHS24 advice to help manage minor symptoms was valued at £5.61 which, together with complementary therapy, was the least preferred management-type [13]. The current research suggests that public confidence in NHS telephone help lines has improved; respondents were willing

to pay £12.28 to manage minor symptoms using NHS24/Direct. For managing rectal bleeding, NHS24/Direct was more highly valued than community pharmacy advice, possibly because participants perceive it as a faster route to specialist services.

Implications for future research or clinical practice

This study presented aggregate preferences. Future research should look at sources of both observed and unobserved heterogeneity; preferences may differ according to a number of factors such as age, gender, experiences of ill health and income. When looking at the impact of income, standardised income scales should be used. Here, data collected on household income is adjusted to take account of the size of the household and the age of its members (whether they are adults or children). A wide range of equivalence scales exists [19]. To allow for unobserved heterogeneity, alternative econometric models such as mixed logit and latent class models could be further explored [12].

A comparison of the impact on estimated coefficients of potential biases that may exist within an on-line panel survey (resulting from e.g. panel composition and/or response) also merits further inquiry. One avenue for future research would be to compare the values generated across mailed surveys and on-line panel surveys.

Self-care was the preferred management-type for minor illness and GP consultation for potentially very severe symptoms. These are likely to be the most appropriate actions for those symptoms, which is encouraging. In practice, however, many GP consultations are for conditions that could probably be managed without GP input [5]. The moderate (back pain) scenario in this study described symptoms that in most cases would be self-limiting. Our respondents, however, stated a preference for GP consultation when managing this scenario. Respondents possibly perceived the symptoms as more severe than intended, but this finding may also indicate that symptom severity is not the only driver behind consulting behaviour. Previous researchers have described the complex nature of consulting behaviour [20-23]. A proportion of consultations for minor conditions may be understandable and

appropriate. For other cases where self-care would be a reasonable response, our findings suggest that promoting self-care and existing support services, may need further development to make an impact on GPs' case mix. In some areas new initiatives help patients choose the most appropriate service when they experience symptoms [24], and services like the Minor Ailment Service will meet the needs of some who would previously have consulted their GP. Future evaluation of these and other initiatives should consider their impact on the nature of GP consultations.

The action of consulting prevents other people from accessing appointments. Reducing GP caseloads for minor ailments may release appointments for patients with more serious conditions (although overall GP workload may not be reduced [25]). Many patients characterise themselves as responsible users of health services [26,27], but evidence suggests that per-capita GP consultations continue to rise [7]. Our respondents were willing to use alternative health care options, even for more severe symptoms, providing other conditions (cost and convenience) were favourable. This information is valuable in understanding the trade-offs people make in symptom management decision-making and can be applied to support policy implementation. Recent initiatives encourage increasing access to GPs by reducing waiting times and increasing practice opening hours [28]. This policy could potentially further fuel patient expectations and demand, making a reduction in consultations unlikely. Other UK initiatives such as reducing or removing prescription charges in Scotland and Wales may also increase demand for GP services, although the effect of reducing health care charges is a matter of current debate [29]. While improving access to general practice seems like a worthwhile goal e.g. to reduce inequalities, ways of ensuring that GP utilisation is commensurate with the health issues experienced are needed. Reducing consulting for self-limiting conditions may be more effective if targeted at specific patient groups; further research is required to identify these patients.

Primary care services are constantly changing. To guide their development, it is important to take account of patient preferences for different services. Combining this knowledge with the move to GP commissioning could help to enable appropriate allocation of NHS resources and achieve balance between self-care and consulting practices [30].

Acknowledgements

Thanks go to Professor Blair Smith, Dr Elizabeth Delaney and all pilot volunteers for their assistance with development of the symptom scenarios, and to Sylvia Mendolia for analysis advice. We also acknowledge an anonymous referee whose comments made a useful contribution to this paper.

REFERENCES

(1) Pencheon D. Managing demand: Matching demand and supply fairly and efficiently. BMJ 1998;316:1665-7.

(2) Harker R. NHS funding and expenditure. 2011;SN/SG/724. Available from: http://www.parliament.uk/briefing-papers/SN00724. [Accessed November 3rd, 2011].

(3) Bellingham C. How to manage a minor ailments service. Pharm J 2006;276:14.

(4) Hassell K, Whittington Z, Cantrill J, et al. Managing demand: Transfer of self-limiting conditions from general practice to community pharmacies. BMJ 2001;323:146-7.

(5) Banks I. Self care of minor ailments: a survey of consumer and healthcare professional beliefs and behaviour. SelfCare 2010;1:1-13.

(6) McCormick A, Fleming D, Charlton J. Morbidity statistics from General Practice. Fourth national study. 1991-1992. HMSO, London, 1995.

(7) Hippisley-Cox J, Vinogradova Y. Trends in Consultation Rates in General Practice 1995-2008: Analysis of the QResearch® Database. NHS Information Centre for Health and Social Care 2009. Available from: http://www.ic.nhs.uk/webfiles/publications/gp/Trends_in_Consultation_Rates_in_General_Practice_1995_2008.pdf. [Accessed November 3rd, 2011].

(8) Department of Health. Self care - A real choice. Self care support - a practical option. 2005. Available from: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4100717. [Accessed November 3rd, 2011].

(9) Scottish Executive Health Department. Delivering for Health. 2005. Available from: http://www.scotland.gov.uk/Resource/Doc/76169/0018996.pdf. [Accessed November 3rd, 2011].

(10) Rogers A, Flowers J, Pencheon D. Improving access needs a whole systems approach. BMJ 1999 10/02/;319:866-7.

(11) Using discrete choice experiments with a cost-utility analysis framework. 2000; Paper presented at Health Economists' Study Group Meeting, University of Nottingham; 2000.

(12) De Bekker-Grob E, Ryan M, Gerard K. Discrete choice experiments in health economics: a review of the literature. Health Econ 2012;21:145-72.

(13) Porteous T, Ryan M, Bond CM, Hannaford P. Preferences for self-care or consulting a health professional for minor illness: A discrete choice experiment. Br J Gen Pract 2006;56:911-7.

(14) Ryan M, Gerard K, Amaya-Amaya M. Using discrete choice experiments to value health and health care: Springer; 2008.

(15) Research Now. Available from: http://www.researchnow.com/en-GB.aspx. [Accessed November 3rd, 2011].

(16) Watson V, Ryan M. Valuing patient experience factors in the provision of Chlamydia screening. HERU Briefing Paper, University of Aberdeen March 2010.

(17) Ryan M, Watson V. Comparing welfare estimates from payment card contingent valuation and discrete choice experiments. Health Econ 2009;18:389-401.

(18) Gerard K, Lattimer V, Surridge H, et al. The introduction of integrated out-of-hours arrangements in England: A discrete choice experiment of public preferences for alternative models of care. Health Expect 2006;9:60-9.

(19) Atkinson AB, Rainwater, L, Smeeding TM. Income Distribution in OECD Countries. OECD Social Policy Studies 1995, No. 18, Paris.

(20) Campbell SM, Roland MO. Why do people consult the doctor? Fam Pract 1996;13:75-83.

(21) Burton C. Beyond somatisation: A review of the understanding and treatment of medically unexplained physical symptoms (MUPS). Br J Gen Pract 2003;53:231-9.

(22) Koloski NA, Talley NJ, Boyce PM. Predictors of health care seeking for irritable bowel syndrome and non-ulcer dyspepsia: A critical review of the literature on symptom and psychosocial factors. Am J Gastroenterol 2001;96:1340-9.

(23) Uhlig T, Hagen KB, Kvien TK. Why do patients with chronic musculoskeletal disorders consult their primary care physicians? Curr Opin Rheumatol 2002;14:104-8.

(24) NHS Grampian. When you're ill, know who to turn to. Available from: http://www.know-who-to-turn-to.com/. [Accessed November day, 2011].

(25) Bojke C, Gravelle H, Hassell K, Whittington Z. Increasing patient choice in primary care: The management of minor ailments. Health Econ 2004;13:73-86.

(26) Farmer J, Iversen L, Campbell NC, Guest C, Chesson R, Deans G, et al. Rural/urban differences in accounts of patients' initial decisions to consult primary care. Health & Place 2006;12:210-21.

(27) Bury M. Illness narratives: Fact or fiction?. Sociology of Health and Illness 2001;23:263-85.

(28) Department of Health. Improving appointment booking systems - a PCT guide. 2007; Available from: http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Healthcare/PatientChoice/Waitingbookingchoice/DH_4101499. [Accessed November 3rd, 2011].

(29) Thomson S, Foubiser T, Mossialos E. Can user charges make health care more efficient? BMJ 2010;341:487-9.

(30) Department of Health. The Functions of GP Commissioning Consortia: A Working Document. March 2011. Available from: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_125006.pdf. [Accessed February 14th, 2012].

.

Box 1. Discrete choice experiment attributes: descriptions and levels.

Type of management:

GP
You could make an appointment at your GP surgery and get professional medical advice in the usual way. You may or may not be given a prescription or advised to purchase a treatment.

Practice nurse
You could arrange to see the practice nurse at your GP surgery for professional advice/information. You may or may not be given a prescription or advised to purchase a treatment.

Pharmacy
You could ask for professional advice or information from a pharmacist or from a counter sales assistant at a community pharmacy (local chemist). You may or may not be advised to purchase a treatment.

Complementary
You could get advice by consulting a professional complementary therapist such as a herbalist, homeopath, aromatherapist, massage therapist etc. You may or may not be advised to purchase a treatment.

NHS24 / NHS Direct
You could call and ask for information or advice from a health professional on the 24-hour NHS telephone help line. You may or may not be advised to purchase a treatment.

Self-care
You could deal with the symptoms by yourself or by asking for advice from friends or family. This might include using an over-the-counter medicine or a home remedy, exercise, resting etc. You might also look for advice or extra information e.g. from books or the internet. In this case, you would NOT consult a health professional directly.

Do nothing
You could choose to do nothing about the symptoms, i.e. you would not ask anyone for advice or information, and would not change your normal behaviour in any way.

Availability:
The length of time you would have to wait before you can deal with your symptoms in your preferred way. This might include: the time you have to wait for an appointment, travel time, and time taken to get any treatment.

- 0 hours
- 1 hour
- 5 hours
- 1 day
- 2 days
- 5 days

Cost:
We want to know how much you value the different options. One way of doing this is to measure how much you would be willing to pay. We want you to think about how much you would be prepared to spend to get your preferred option This would include **all** associated costs, such as travel costs and the cost of any treatment (for example any consultation fee, over-the-counter medicines, complementary remedies etc).

- £5
- £10
- £20
- £30

Box 2 Symptom scenarios

SYMPTOM 1 – DIARRHEA

PLEASE IMAGINE THIS SITUATION:

You have had diarrhea six times in the last 24 hours. You are experiencing mild cramp-like pains in your stomach and have lost your appetite. A member of your family has had similar symptoms. Your symptoms began yesterday morning and you have been drinking plenty of water. You are feeling a little bit better today but your symptoms still continue.

SYMPTOM 2 - BACK PAIN

PLEASE IMAGINE THIS SITUATION:

You have moderate pain in your lower back that is there constantly. You have not been able to do all the things you usually do and find moving your back difficult. The pain is eased when you are lying down. The symptom began five days ago when you woke up in the morning and you cannot think of an obvious cause.

SYMPTOM 3 – RECTAL BLEEDING

PLEASE IMAGINE THIS SITUATION:

You have noticed blood every time you go to the toilet for a bowel motion. The blood is fresh red in colour and is seen both on the bowel motion and on the toilet paper after wiping. You are feeling well otherwise. The symptom began ten days ago and the amount of blood being passed has remained the same.

Box 3: Example of a choice question

Example **Which option would you choose?**

	Option 1	**Option 2**
Type of management	Self-care	GP
Availability	0 hours	5 days
Cost ☐	£20 ☐	£10 ☐

Table 1: Characteristics of questionnaire respondents

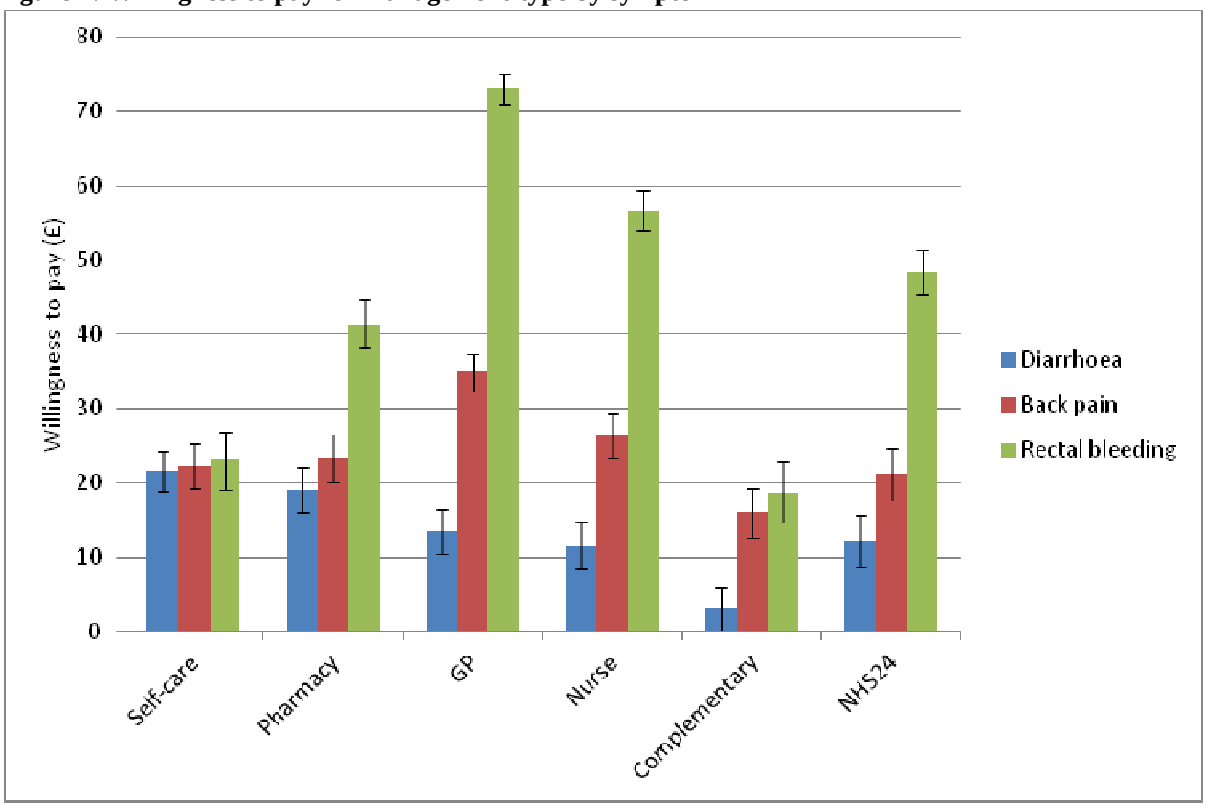
		Respondents% (n)
Gender (N=480)	Male	50.2 (241)
	Female	49.8 (239)
Age range (N=480)	18-24	19.2 (92)
	25-34	16.9 (81)
	35-44	20.4 (98)
	45-54	17.1 (82)
	55-64	12.7 (61)
	65+	13.8 (66)
Marital status (N=480)	Single	28.1 (135)
	Married/living with partner	61.7 (296)
	Divorced/separated	7.5 (36)
	Widowed	2.7 (13)
Ethnicity (N=480)	White (British/Irish/Other)	93.1 (447)
	Black/Black British (Caribbean/African/Other)	1.0 (5)
	Asian/Asian British (Indian/Pakistani/Bangladeshi/Other Asian)	2.7 (13)
	Chinese or other east & south east Asian	1.7 (8)
	Mixed (White and Black Caribbean/White and Black African/White and Asian)	0.8 (4)
	Any other mixed	
	Prefer not to say	0.2 (1)
		0.4 (2)
Educational qualifications (N=480)	No formal qualification	6.5 (31)
	GCSE/O-grade/O-level/Standard grade	25.2 (121)
	A level/AS level/Scottish Higher/NVQ levels 3 or 4	30.2 (145)
	Undergraduate degree	21.3 (102)
	Postgraduate degree	10.0 (48)
	Professional qualification	6.9 (33)
Household income (N=480)	Under £10,000	8.3 (40)
	£10,000 to £19,999	21.3 (102)
	£20,000 to £29,999	21.0 (101)
	£30,000 to £39,999	14.4 (69)
	£40,000 to £49,999	9.6 (46)
	£50,000 and over	15.6 (75)
	Prefer not to say	9.8 (47)
Smoking status	Smoker	22.7 (109)
	Ex-smoker	47.5 (228)
	Never smoked	29.8 (143)
Pay prescription charges	Yes	57.5 (272)
	No	42.5 (201)

Table 2: Results of conditional logit regression analysis

Variable	Symptom		
	Diarrhoea	**Back pain**	**Rectal bleeding**
Constant [1]			
Regression coefficient (β)	1.31	1.22	0.91
95%CI	1.12 to 1.50	1.03 to 1.42	0.68 to 1.14
p value	< 0.001	< 0.001	< 0.001
Management-type (*reference level for management-type = self-care*)			
Pharmacy			
β	-0.15	0.06	0.73
95%CI	-0.31 to 0.01	-0.11 to 0.23	0.56 to 0.90
p value	0.062	0.512	< 0.001
GP			
β	-0.50	0.69	1.98
95%CI	-0.71 to -0.28	0.48 to 0.90	1.74 to 2.23
p value	< 0.001	< 0.001	< 0.001
Practice nurse			
β	-0.61	0.22	1.34
95%CI	-0.80 to -0.41	0.03 to 0.41	1.15 to 1.53
p value	< 0.001	0.023	< 0.001
Complementary			
β	-1.12	-0.35	-0.17
95%CI	-1.34 to -0.90	-0.55 to -0.14	-0.37 to 0.04
p value	< 0.001	0.001	0.107
NHS24/NHS Direct			
β	-0.56	-0.06	1.00
95%CI	-0.74 to -0.39	-0.24 to 0.11	0.82 to 1.18
p value	< 0.001	0.493	< 0.001
Availability (days)			
β	-0.18	-0.13	-0.16
95%CI	-0.23 to -0.14	-0.17 to -0.09	-0.20 to -0.11
p value	< 0.001	< 0.001	< 0.001
Cost (£)			
β	-0.061	-0.055	-0.040
95%CI	-0.067 to -0.054	-0.061 to -0.049	-0.045 to -0.034
p value	< 0.001	< 0.001	< 0.001
Log likelihood	-4118.3873	-4160.5094	-3648.2565
Pseudo R2	0.1194	0.1104	0.2199
Number of individuals (observations)	473 (12,771)[2]	473 (12,771)[2]	473 (12,771)[2]

1. The two constant terms were initially entered separately into the regression equation. The Wald test indicated no significant difference so they were merged into a single constant.
2. Number of observations = 12,771 (473 individuals x 9 choices x 3 options)

Figure 1: Willingness to pay for management-type by symptom



Error bars show 95% confidence interval for willingness-to-pay. Overlapping error bars indicate no significant difference in willingness-to-pay.