

**WILLINGNESS TO PAY FOR COLORECTAL CANCER  
SCREENING: FAECAL OCCULT BLOOD TEST  
VERSUS FLEXIBLE SIGMOIDOSCOPY:**

**By**

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## **Introduction**

Cancer of the colon and rectum is one of the most common cancers in the USA and Europe. The disease has an established stage progression and the observed close association between stage at detection and post-diagnosis survival justifies early intervention. As the earliest stages of the disease tend not to present symptomatically, it has for some time been thought that mass population screening programmes could prove effective in reducing mortality [1]. A number of possible screening techniques are available [2], one of which has already been the subject of extensive clinical and economic evaluation. Given the tendency of colorectal tumours to bleed, regular testing to signal the presence of faecal occult blood (FOB) can select candidates for more detailed investigation using endoscopic or radiological procedures. The trials of FOB screening currently report relative colorectal cancer mortality reductions of the order of 16 per cent in their screening arms, on average [3]. Evidence from the UK trial of FOB screening suggests that the method would be cost effective in principle [4] and pilot screening projects, involving biennial FOB testing for subjects aged 50-59 years, have been announced [5].

The present trial involves a different protocol of cancer screening, namely, the offer of flexible sigmoidoscopy (FS), once only to subjects at around 60 years of age [6]. Unlike FOB screening in the UK, where subjects complete the test in their own homes, FS screening necessitates a clinic visit. The trial's pilot phase has shown that the protocol is both feasible and acceptable to patients [7].

This paper presents the results so far of a study designed to investigate people's preferences for flexible sigmoidoscopy and faecal occult blood testing.

The study has four objectives. Firstly, to estimate a monetary estimate of the value of information from screening for colorectal cancer, i.e. a robust estimate of the willingness to pay for this information. Secondly, to assess whether faecal occult blood testing is more or less valued/acceptable than flexible sigmoidoscopy, i.e. a comparison of the actual modalities for screening colorectal cancer. Thirdly, to ascertain whether the way in which the question is asked affects the responses given,

i.e. a comparison of the open ended versus payment scale questionnaires. And finally, to assess the impact of demographic factors on the absolute and relative valuations.

Preventative medicine can reduce anxiety and produce a benefit in the form of peace of mind. The measurement technique of WTP allows individuals to decide the nature of their utility function and to take account of all factors which are important to them in the provision of a service [8]. WTP is measured by the CVM, which was originally developed in environmental economics to measure the value of environmental improvement [9]. The contingent valuation, or WTP, method is currently receiving increased attention in the medical field where it is being used to value health changes [8-14]. WTP is based on the principle that the maximum amount of money an individual is WTP for a service is indicative of the value they place on that service. When evaluating a medical service such as screening it is important to take account of the process of care as some individuals may gain negative value from use. WTP allows all relevant elements in a consumer's utility function to be included and when estimating WTP, consumer's can trade off these aspects of care.

In the study, the WTP values for both tests can be taken as an indication of preference strength for one test over another. By asking the respondents to reveal their preference before their WTP value this allows investigation of the internal validity of the WTP technique, i.e. are the respondents answering the WTP question in a way one would expect *a priori*. In this respect it is the relative rather than the absolute WTP values which are important.

WTP questions can be classified into open-ended, payment scale and closed-ended (binary) questions. After much concern over the use of WTP techniques an expert panel was formed under the auspices of the National Oceanographic and Atmospheric Administration (NOAA) [18]. The report from the panel criticised open-ended approaches as providing 'biased and erratic' results. The open-ended question involves the respondent being asked directly what the maximum amount is that they would be prepared to pay for a service. Maximum WTP is then estimated using simple descriptive statistics such as the mean and the median. Despite the criticisms of the technique made by the panel, the relationship of WTP to prior preferences and to income using this technique has been shown to be valid [18].

Using the payment scale technique respondents are presented with a range of values and asked to circle the amount that represents the maximum that they would be WTP. The payment scale question has the advantage that respondents find it easier to answer than the open ended question.

The use of binary questions is recommended by the expert panel to assess the reliability and validity of the CVM. This approach asks individuals whether they would pay a specified amount for a given service, with possible responses being 'yes' or 'no'. By varying the price in different sub samples, the relationship between the price and the proportion of individuals who are WTP can be traced. The advantage of this technique is that it more accurately reflects 'real-life' behaviour, i.e. individuals being presented with a price after which they consider if the product is 'worth it'. However this approach requires a larger sample size to ensure accurate estimation of WTP [14].

The decision to examine the open-ended and payment scale technique in the study was made for two reasons. Firstly, without any prior knowledge of the range of values elicited by respondents for the screening procedures it would be difficult to accurately estimate the price bands for the closed ended technique and secondly, the closed ended technique requires a large sample size which given the nature of the study, was not guaranteed.

Comparisons are made between the rate of completion of the payment scale relative to the open-ended approach. It is expected that the payment scale question will produce a high response rate due to its simplistic nature [13]. The payment scale approach presents a range of values for the respondent to circle hence it is hypothesised that the respondent is less likely to attempt to estimate the 'cost' of the health service as they have reference points to work from. It is believed that the open-ended technique will lead to attempts to estimate the 'cost' therefore leading to a value which will not encompass the full consumer surplus as the respondent will be WTP more than their stated amount. If this is true this will lead to the WTP value for the payment scale question being higher than the open-ended [13].

## **Study Design**

WTP data were obtained by means of a postal questionnaire, containing a description of colorectal cancer and methods for screening. The questionnaire requested estimates of WTP for both FOB and FS screening, the reasoning behind the estimates, basic socio-demographic and state-of-health data, and attitudes towards health in general. The instrument was initially piloted on approximately 30 subjects, recruited through a local general practice. After revision, the instrument was presented for ethical approval, as a result of which further modifications were made. The project was then submitted to the Trent Focus, a collaborative research network of GPs, who offer assistance in, amongst other things, questionnaire distribution. Of the 90-odd members of the Focus, 22 practices volunteered to distribute questionnaires to patients during visits to their surgeries. Participants were drawn from across the region, ranging from Sheffield and Grimsby in the north, down as far as Leicester in the south.

In November 1998, approximately 7,000 questionnaires were distributed to the 83 participating GPs (with the payment scale and open-ended instruments being equally represented). GPs were asked to offer the questionnaire to all patients, but to exclude those under around 25 years of age (on grounds of relevance), those with a recent diagnosis of cancer in the family (on the grounds of minimising unnecessary distress) and those with reading/learning/language difficulties. Questionnaires are still being returned at the time of writing, and the results presented below pertain to analyses of the first 2,330 questionnaires received. An assessment of questionnaire compliance will not be possible until later on in the year, when follow-ups with distributing GPs have been undertaken.

## **Results**

### **A. Sociodemographic Data**

Demographic data for the respondents that have completed the questionnaires so far are presented in table 1. A higher proportion of respondents were females

(62%) as might be expected, given that females are the more frequent visitors to GP surgeries [20]. The largest proportion of respondents were married (78%). The distribution of income among respondents complies with *a priori* expectations, the

**Table 1: Respondent demographic data**

<b>Variable</b>	<b>Total</b>	<b>Open-ended</b>	<b>Payment-scale</b>
<b>Age (mean [median])</b>	50 [49]	50 [49]	50 [50]
<b>Gender (%)</b>			
<b>Male</b>	37	36	36
<b>Female</b>	62	63	62
<b>Missing</b>	1	1	2
<b>Marital Status (%)</b>			
<b>Single</b>	15	16	15
<b>Married</b>	78	77	79
<b>Widowed</b>	6	6	5
<b>Missing</b>	1	1	1
<b>Children (%)</b>			
<b>None</b>	17	16	17
<b>One</b>	15	16	14
<b>Two</b>	37	36	37
<b>Three</b>	17	16	16
<b>Four</b>	6	6	7
<b>&gt;4</b>	2	3	2
<b>Missing</b>	6	7	7
<b>Employment (%)</b>			
<b>Employed</b>	55	55	55
<b>Unemployed</b>	5	5	5
<b>Housewife/househusband</b>	11	10	11
<b>Retired</b>	24	24	24
<b>Other</b>	4	5	4
<b>Missing</b>	1	1	1
<b>Age Left Education (%)</b>			
<b>10-14</b>	9	10	9
<b>15-16</b>	53	51	54
<b>17-18</b>	17	16	18
<b>19-22</b>	11	12	11
<b>&gt;22</b>	4	6	4
<b>missing</b>	6	5	4
<b>Household income (%)</b>			
<b>Less than £10,000</b>	24	25	24
<b>£10,000 - £20,000</b>	31	32	29
<b>£20,001 – £30,000</b>	18	18	19
<b>&gt; £30,000</b>	16	15	16
<b>Missing</b>	11	10	12
<b>Received Test (%)</b>			
<b>FOB</b>	3	3	3
<b>FS</b>	5	4	5
<b>Both</b>	1	1	1
<b>Missing</b>	91	92	91

largest proportion being in the £10,000-£20,000 bracket. Only 3% and 5% of respondents have received FOB or FS previously. As can be seen from table 1,

respondent demographic data captured by the payment scale and the open-ended questionnaires are similar. A series of chi-squared tests between the open ended and payment scale approaches showed no statistical differences across the variables proving the randomisation procedure to be successful.

### **B. Type of Questionnaire**

It is believed that the use of the payment scale approach would lead to a higher rate of completion of the WTP question amongst those questionnaires returned [13]. This is because respondents find it easier to understand and complete the payment scale compared to the open ended approach. We investigated this hypothesis for each of the screening tests. For FOB, out of 1278 returns in the group receiving open ended, 897(70%) responded to the WTP question. In the group receiving payment scale 1113 (85%) responded to the WTP question out of a total of 1301. This difference in the WTP question response rate for FOB is not statistically significant at the 5% level ( $z = -9.4$ ). The rate of completion of the FS WTP question was 841(66%) out of the open ended returns compared to 1002 (77%) of payment scale returns. Again, the difference in the rate of completion of the WTP question between open ended and payment scale was not statistically significant at the 5% level, ( $z = -6.3$ ). The results from our study therefore do not support the hypothesis that respondents find it easier to complete the payment scale question.

Overall, the average maximum WTP for FOB and FS screening was £104.26 and £88.86 respectively. Table 2 illustrates the average maximum WTP for FOB and FS separately for payment scale and open ended. To investigate the hypothesis that respondents are more likely to give a higher WTP for the payment scale approach relative to the open-ended approach we can examine the difference between the WTP value [13].

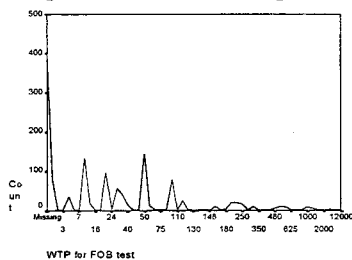
**Table 2: WTP for FS and FOB by payment and open-ended approach.**

	WTP FS (£'s)	WTP FOB (£'s)
<b><u>OPEN-ENDED</u></b>		
Mean (95% CI)	83.67	119.15
Median	30.00	30.00
Percentiles:		
25	10	10
50	30	30
75	50	100
<b><u>PAYMENT SCALE</u></b>		
Mean (95% CI)	94.45	92.48
Median	50.00	50.00
Percentiles:		
25	20.00	20.00
50	50.00	50.00
75	100	100.00

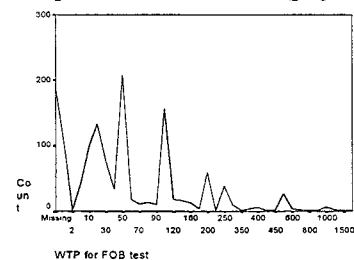
Our results show that there is no statistical difference between the mean WTP for the open-ended and payment scale technique. Comparisons of mean WTP across payment and open ended for FOB give F value of 2.983, P = .084. For FS, comparisons give F value of .259, P = .611. Perhaps this hypothesis is making assumptions about people's preferences as they may not value the screening test highly therefore are WTP less than the estimated cost.

It is worth noting the distribution of the WTP values of open-ended relative to payment scale. This can be illustrated in graphs 1-4.

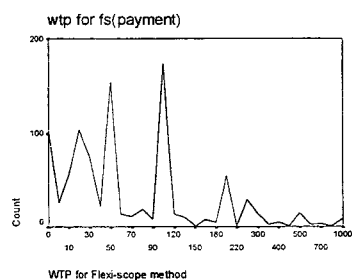
**Graph 1 WTP for fob (open ended)**



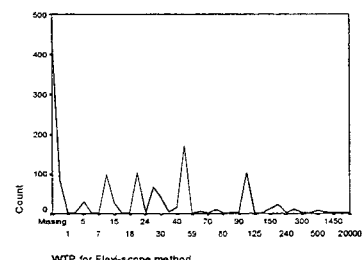
**Graph 2 WTP for FOB (payment)**



**Graph 3 WTP for FS (payment)**



**Graph 4 WTP for FS (open-ended)**





The peaks in both the payment scale and open-ended graphs can be explained by the tendency for respondents to give 'round' figures as their maximum WTP value. Concentrating on the open-ended distributions, (graphs 1 and 4), we can see that the FOB graph is more skewed to the left than the FS graph. Perhaps this is due to respondents perceiving FS to be a more sophisticated test hence giving higher WTP values as they believe that it costs more to the NHS. Since the payment approach presents respondents with a scale of values *a priori* expectations would have thought the variance of the payment scale to be smaller than the open-ended because respondents have the set values at which to estimate their WTP. Concentrating on the distribution of the WTP for FS, graphs 3 and 4 exhibit a pattern that agrees with this hypothesis. The variance of the open-ended is greater than the payment scale. The difference in the distribution between open ended and payment scale is not as marked in the FOB group.

The questionnaire asked respondents for their preferred screening test. Table 3 illustrates the preference groups for FOB and FS.

**Table 3: Preferences and WTP.**

Preference	Number	%
FOB	1110	45
FS	323	13
No Preference	1022	42
TOTAL	2455	100

\* 125 missing responses

Forty five percent of respondents indicated a preference for FOB whilst 13% had a preference for FS. This difference is statistically significant at the 5% level (chi sq. = 454.46, P = .000).

Prior economic expectations would anticipate that respondents would give a higher maximum WTP value for their preferred screening method, [10]. We can investigate this hypothesis by looking at the proportion of respondents who indicated a WTP value greater for FOB than FS for each of the preference groups. For the purpose of evaluation we will concentrate only on the 1773 respondents who

responded to both questions, i.e. indicated a preference group and elicited a WTP value for FOB and FS.

**Table 4: WTP for preference groups**

Preference Group	Is WTP FOB > WTP FS?			Total
	No	Equal	Yes	
FOB	184(10%)	405(24%)	185(10%)	774(44%)
FS	79(4%)	110(6%)	47(3%)	236(13%)
No preference	179(10%)	404(23%)	180(10%)	763(43%)
Total	442(24%)	919(53%)	412(23%)	1773(100%)

Twenty percent of respondents who indicated either a preference for FOB or no preference were prepared to pay more for FS. This could be explained by respondent's perception that FS is a more sophisticated procedure leading to higher costs for the NHS or perhaps the respondents simply did not understand what was being asked of them. Should these WTP values be classed as invalid?

Out of the respondents preferring FOB (45%), 24% gave equal WTP values for both FOB and FS. Of those respondents preferring FS (13%), 6% gave equal WTP values. One possible explanation for this could be that respondents might have a preference for one method over another but that this preference is not strong enough for them to be WTP more for it, [13].

To measure respondent's intensity of preference for one screening method over another we can calculate the WTP ratios for each of the preference groups, [10]

**Table 5: Intensity of preferences for FOB and FS.**

Preferences	WTP ratio
All cases	WTP FOB/ WTP FS = 1.17
Preference for FOB	WTP FOB/ WTP FS = 1.27
Preference for FS	WTP FS/ WTP FOB = 1.17
No preference	WTP FOB/ WTP FS = 1.10

Overall, the WTP for FOB was 17% greater than that for FS. This difference was statistically significant, (5% level).

Out of the group of respondents that indicated no preference for either test (42%), they were on average willing to pay 10% more for FOB. The difference between the WTP FOB and WTP for FS for this group was not statistically significant at 5% level.

Respondents that indicated a preference for FOB (43%) were on average willing to pay 27% more for their preferred method. Respondents that preferred FS (12%), were on average only WTP 17% more for their preferred test. Therefore we can infer from this that those respondents that preferred FOB to FS did so more intensely than those that preferred FS to FOB. Proposed reasons for the greater intensity of preference for FOB over FS could be the respondent's aversion to the invasiveness of the FS test or the belief that more frequent testing (FOB) will be more likely to detect cancer.

The internal validity of the open-ended and payment scale approach can be examined by looking at the distribution of WTP according to social class, where social class is used as a proxy for ability to pay.

**Table 6: Comparisons of WTP across social class groupings for payment scale and open-ended**

Social Class	FOB TEST				FS TEST			
	Payment scale	Open-ended	F value	sig.	Payment Scale	Open-ended	F value	Sig.
1	£117.66	£250.81	1.421	0.235	£136.19	£276.31	0.531	0.450
2	£118.51	£126.91	0.145	0.704	£98.95	£61.47	12.77	0.000
3 non-manual	£91.92	£113.11	0.328	0.567	£91.07	£45.31	12.65	0.000
3 manual	£61.68	£131.92	4.737	0.031	£59.71	£81.45	0.899	0.344
4	£77.50	£61.57	1.336	0.250	£87.69	£43.72	9.44	0.003
5	£96.38	£94.64	0.002	0.968	£114.43	£43.20	4.242	0.044

We would expect the WTP values to progressively fall moving from social class 1 – 5, [13]. From table 6 we can see that neither the payment scale nor the open-ended approach for both tests exhibit this pattern. Results from an ANOVA test reveal that the difference in the average maximum WTP between open ended and payment scale are statistically significant for social class 3 (manual) for the FOB test, and social class 2, 3(non-manual) and 4 for the FS test.

It is believed that the difference in the WTP value between the open-ended and payment scale are more marked amongst higher social economic groups, [13]. This is because respondents in higher social economic groups have a greater ability to pay allowing them to go beyond their estimation of cost. We can investigate this hypothesis by examining the difference between the mean WTP for FOB and FS for open ended and payment scale for each social economic group to see if the difference is statistically different.

**Table 6: comparison of mean WTP for SEG groups.**

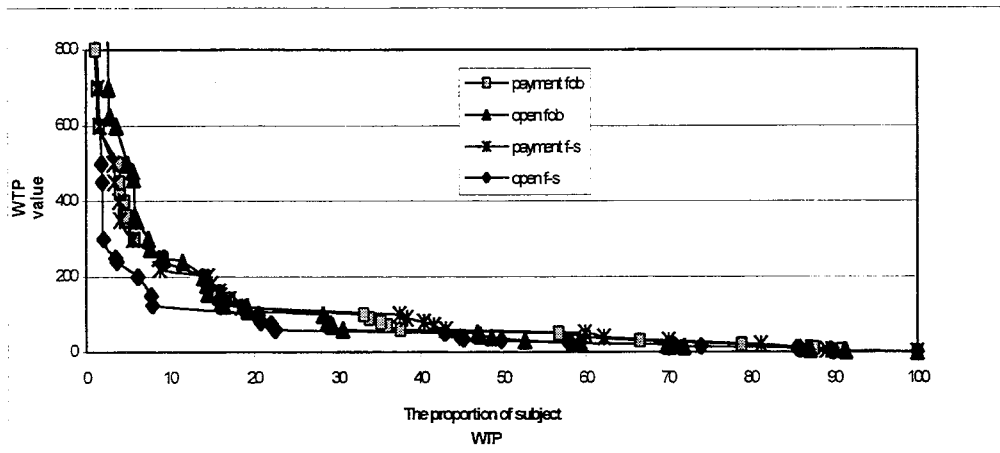
SEG Groups	FOB TEST				FS TEST			
	Payment Scale	Open-ended	F value	P value	Payment Scale	Open-ended	F value	P value
1-3	107.88	119.17	.206	.651	95.93	70.20	4.25	.040
4-5.2	124.63	199.52	1.545	.215	172.55	117.50	.314	.576
6-8	65.78	102.10	2.104	.148	62.36	68.09	.087	.768
9-11	89.14	101.95	.243	.622	95.59	42.89	24.91	.000
>11	115.29	108.54	.017	.897	117.29	81.52	1.762	.193

For the purpose of evaluation, we re-grouped the social economic groups into larger groups. Table 6 illustrates the results from an ANOVA on the average maximum WTP for FOB and FS for payment and open-ended questionnaires for each class of SEG. The table shows a significant difference between open ended and payment scale WTP values for SEG 1-3 and 9-11 for the FS test, however, the results failed to show a more marked difference between the WTP values for open ended and payment scale in the higher social economic groups.

### **C. Demand for Screening**

Figure 1 exhibits the demand curve for FOB and FS, i.e. the proportion of respondents WTP each price for both FOB and FS for each type of questionnaire approach used.

**Figure 1: Demand curve for FOB and FS for both questionnaire types, i.e. payment scale and open-ended.**



The demand curves for the two tests derived from both the open-ended and payment scale questions are remarkably similar. For each WTP value, the proportion of subjects that were willing to pay is almost the same for both tests. One plausible reason which could explain this result is that perhaps respondents have given a WTP value for the benefits derived from colorectal cancer screening as a whole and have failed to, or are not concerned with, the relative difference in the screening procedure used.

#### **D. Multivariate Analysis**

The study results were analysed using ordinary least squares (OLS) regression, with the WTP value as the dependent variable. To compensate for the clustering of WTP values we transformed the WTP to its natural logarithm. Attributes hypothesised as significant predictors of WTP were included as independent variables in the regression.

A general to specific regression was used with explanatory variables being excluded in a stepwise fashion. Using this method the first variable to be excluded from the regression equation is the one with the smallest positive or negative correlation with WTP. The variable is dropped from the equation if the  $p$  value is greater than 0.05. All variables are tested for exit and entry according to these steps.

WTP was regressed on the variables listed in Table 7.

**Table 7. Variables included in the regression model**

Description of variable	Variable Name
Type of questionnaire(0=payment scale, 1=open-ended)	Questionnaire type
Subject's responses to common health promotion messages	Health belief scores
Smoker (0=non-smoker, 1=smoker)	Current smoker?
Income of household	Income
Gender(0=female, 1=male)	Gender
Assessment of personal risk from colorectal cancer in comparison with female/male of the same age(0=average risk, 1= above average risk)	Chances?
Age (in years) when the subject left full-time education	Education
How worried are you about getting bowel cancer?(0=else, 1= very worried)	Worried?
Number of visits made to the dentist during the preceding two years.	Dental visit
Indication if the subjects or their families had ever suffered from haemorrhoids, stomach problems, heart troubles, cancer, stroke or depression (sum of indications ranging from 0-12)	Illness experience

To test whether there was a significant difference in the WTP across the two types of questionnaires (open-ended vs. payment scale) this independent variable was included in the questionnaire. This took on the value of zero if payment scale and one if open-ended. If there was a significant difference in the WTP values then this would be expected to be reflected in the *p* value, (i.e. having a *p* value less than or equal to 0.05).

Subjects were asked for a response to common health promotion messages, i.e. agreement with the importance to personal health or regular breast and cervical screening, exercise and fresh fruit. Each statement was scored on a 1-5 scale, ranging from 'not at all important' to 'extremely important', and the independent variable is thus the mean score for the four.

The questionnaire data located subjects in one of four income bands. For this independent variable, data were re-coded as mean incomes within each of the bands, i.e. £5k, £15k, £25k and £35k.

Subjects provided a subjective assessment of their personal risk from colorectal cancer in comparison with a typical male/female of their age, possibilities ranging from 'much lower' (coded 1) through 'lower' (2), 'about the same' (3), 'higher' (4) to 'much higher' (5). These data were re-coded as 1 for those perceiving themselves to be at above average risks (4&5). The remainder were re-coded 0.

Responses to the statement - 'how worried are you about getting bowel cancer'? ranged from 'not at all worried' (coded 1) through 'a bit worried' (2), 'quite worried' (3), and 'very worried' (4). For the regression, these data were re-coded as 'very worried' =1, else 0.

Subjects were asked to indicate if they or their families had ever suffered from haemorrhoids, stomach problems, heart troubles, cancer, stroke or depression. Each such indication was coded 1 (else 0). This independent variable is the sum of these indications of experiences of, or familiarity with, illnesses, implying a possible range of 0 through 12.

Table 8 shows the results from the FOB and the FS model.

**Table 8: Regression results**

Variable	FS model			FOB model		
	$\beta$	t-ratio	sig.	$\beta$	t-ratio	sig.
Constant	2.848	12.12	0.00*	2.515	9.83	0.00*
Questionnaire type	-0.559	-10.07	0.00*	-0.235	-3.78	0.00*
Health belief scores	0.069	1.35	0.18	0.139	2.51	0.01*
Current smoker?	-0.163	-2.24	0.03*	-0.141	-1.75	0.08
Income	0.019	6.71	0.00*	0.021	6.97	0.00*
Gender	0.107	1.82	0.07	0.174	2.63	0.01*
Chances?	0.228	2.70	0.01*	0.359	3.74	0.00*
Education	0.020	3.61	0.00*	0.010	1.67	0.10
Worried?	0.391	3.12	0.00*	0.166	1.16	0.25
Dentist visit	0.046	2.55	0.01*	0.041	2.07	0.04*
Illness Experiences.	0.040	2.29	0.02*	0.054	2.77	0.01*

The positive sign on the income and education variable indicates as we would expect that the higher the income and the higher the education age of the respondent, the greater the WTP value. The positive coefficient on illness experience implies that the more experienced or familiar the respondent is with major illnesses the greater the

WTP value. The positive coefficient on chances indicates that respondents who worry about contracting colorectal cancer place a higher value on screening. This is what we would expect. Other things remaining equal, the expressed WTP for either screening procedure is higher if the subject are male and express their WTP valuations by means of a pre-specified payment scale rather than by open-ended questionnaire. This finding supports the previous hypothesis that respondents attempt to estimate cost more with the open ended relative to the payment scale approach leading to the WTP value elicited by the payment scale being higher.

The negative sign on the smoking variable indicates, as we would expect, that if the respondent does not smoke the more likely they are to give a higher WTP value. The positive sign on health belief scores and the dental visits variable implies that the respondents who visit their dentist frequently and who strongly accept the health promotion messages will place a higher value on screening for bowel cancer. Again, this is what we would expect.

#### **E. Further work and comments**

To the best of our knowledge, this is one of the largest WTP study ever to be undertaken in the UK. We conducted a WTP study of patients valuing two competing screening tests, FOB and FS, for colorectal cancer.

The average maximum WTP for FOB and FS using the open-ended approach is £119.12 and £82.61 respectively, using the payment scale it is £92.28 and £94.11 respectively.

The multivariate analysis presented above represents only the “best first attempt” conditioned by the time available to us. The model remains to be tested in depth, and alternative formulations have yet to be assayed. Despite the significance of the coefficients in this model, and the plausibility of their signs, the proportion of variance explained remains very small. We are presently unclear as to the causes of this lack of explanatory power.



It is interesting that revealed WTP differs insubstantially between the two screening methods. It is possible that we have discovered an embedding effect i.e. people value the general good rather than any specific form of the good [15].

All questionnaire respondents were invited to provide reasons, as written comments, for providing the WTP valuations which they did. Approximately 65 per cent provided such comments. These responses have yet to be analysed in details but cursory examination leads us to suspect that a sizeable proportion believe that, when screening is introduced in the future, they will actually have to pay. Many commented on the ethical unacceptability of paying for such health care; indeed, such a response is common in WTP valuation.

The NOAA panel [18] recommends that WTP be valued using closed-ended questionnaires, i.e. each respondent is provided with a price/value and then offered the binary choice of WTP or not-WTP. We have recently issued 800 copies of a closed-ended version of our questionnaire, using exactly the same distribution method as before. This will enable us to directly compare the results of three WTP methodologies. Again, reasons for subjects' views on WTP have been requested.

## References:

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