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Title: Willingness to pay (WTP) for gender: Using Discrete Choice Experiments (DCEs) to calculate WTP of patients with menstrual disorders, for a female rather than male doctor.

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Methods: We undertook a DCE to assess having more of the care of patients with period problems in primary not secondary care. After dialogue with service providers / patients we identified potential attributes. We conducted a rating exercise of potential attributes, confirming the importance of a male / female doctor attribute. During *DCE piloting* no one indicated preference for a male doctor, 17 / 35 (48.5%) indicated a preference for a female doctor, and 18 / 35 (51.5%) no preference.

SPEED was used for choice scenarios. Final attributes included, time spent waiting for an appointment with the doctor; time waiting for test results; how often patients saw the same doctor; whether patients saw a GP or Consultant; whether patients had a male or female doctor; and cost to you (to monetarize coefficients on attributes). In Leicester, the relevant hospital doctors are male, thus sex of the doctor may delineate the 2 possible models of care (for women who can select a female GP).

Results: Random effects Probit was used. Overall we sent out 193 final versions of the questionnaire to women in Leicestershire with period problems, obtaining 124 completed responses back (c.64%), of which 117 proved to be consistent responders (c.60%) which were used for econometric analysis. A *simple model* based on 117 responses, showed all the attributes to be significant at the 1% level, and signs / magnitudes of coefficients seemed plausible. Baseline analysis showed the *average* WTP was £50.76 for a female as opposed to male doctor. Another model calculated WTP for *those with a preference for a female doctor* to be £150.21. We also probed whether 'cost to you' was factored into decision making. Using interaction dummies we probed how WTP estimates vary, as we derive the coefficient purely for those respondents who factor it in. The findings indicate the robustness of using DCEs to calculate WTP may be questionable due to widespread failure by many respondents to factor 'cost to you' into their decision making.

Possible issues for discussion by HESG Audience: a) How should factors shaping these preferences be probed; b) Can / should such preferences be accommodated; c) What systems need to be in place to accommodate them; d) What are the implications of these findings for using DCEs to calculate WTP.

Introduction.

We undertook a DCE conjoint analysis. It was part of a project designed to look at the clinical implications, and the implications in terms of meeting patient preferences, of delivering different models of healthcare provision. We evaluated new ways of

delivering care across the primary / secondary care interface (i.e. replacing traditional models whereby most of the care would be via a hospital Consultant, for women with period problems). Although conjoint analysis has previously been applied to women with period problems (San Miguel et al 2000), the focus of that work was primarily on different clinical management options. In contrast we evaluated an alternative whereby GPs would provide the care for women with period problems (but with back-up support from hospital consultants), and compared it with the traditional secondary care based referral model.

Patient sample profile.

All the patients had some form of period problem, and the sample had all *initially* been referred to secondary care. This is still work in progress, so I cannot present a full range of socio-economic and clinical information about the profile of respondents (this information should be available from other collaborators on the project later, before this paper is finally refined and submitted). However the age range of the sample of respondents was as follows:

Table 1.

Age	Number responding in this way
20-30	2 (1.6%)
30-40	14 (11.3%)
40-50	75 (60.5%)
50-60	30 (24.2%)
No response	3 (2.4%)
Average age of those responding	44.87 years

This age profile does not appear atypical of women with period problems in Leicestershire. Moreover, we also posed the following question:

The average annual household income before tax in Leicestershire is about £25,000. Is your household income:

- Above average
- About average
- Below average

We obtained the following answers (table 2 below) which suggests our sample is slightly skewed towards above average income households. However, this finding might be expected given the age profile of the women, and the fact that many such women will have families (perhaps meaning the average number of earners per family is higher than the norm for Leicestershire households).

Table 2.

Answer	Number responding in this way
Above average	55 (44.4%)
About average	27 (21.8%)
Below average	37 (29.8%)
No response	5 (4%)

Attributes and Levels.

Based on conversations with patients and staff, a list of possible attributes was compiled. Patients were also allowed to suggest attributes to add to the list, and then asked to rank them in order of importance (using a ranking list). The final selection of 6 attributes (detailed in the table 3) was made after reflecting on patients responses, by the projects steering committee.

Table 3.

Attributes	Levels
How long you have to wait for test results	1 day, 2 days, 2 weeks, 4 weeks
The type of doctor you see	GP or Consultant
The sex of the doctor you see	Male or Female
Time spent waiting for an appointment to see the doctor (either the GP or the consultant)	1 day, 4 days, 6 weeks, 12 weeks
How often you get to see the same doctor	None of the time, Half of the time, All of the time
Cost to you (i.e. perhaps because of absence from work or travel costs – <u>Please assume you would loose this amount of money even if you would not</u>). ¹	£0, £25, £75, £125

We had also done a pilot conjoint analysis on a small sample of responses to ensure those attributes which appeared as strong contenders for inclusion on the list, were tested in a small scale DCE, to see if the coefficients were significant - reassuringly they were! The levels for the attributes were selected to relate to prevailing waiting times for results, and waiting for a doctors appointment; the attribute relating to how often you get to see the doctors was included to establish how much patients value continuity of provision, and had 3 descriptive levels. Inevitably which form of doctor patients had (either a Consultant or GP), may impact on perceived quality of provision. An attribute was also included to see if we could normalise the value of differences in other attributes in monetary terms. In the early pilot work we did try to establish what a number of potential respondents might consider to be the best descriptor for it. Talking of willingness to pay can seem somewhat unreal to respondents unused to paying for their care. So we asked responders to rank a few descriptors for describing this attribute (including willingness to pay, cost to you, and amount to you). The descriptor 'cost to you' seemed to be the one that most of our sample best identified with and thus more would take notice of, so we used it.

Finally we discovered during piloting and as a consequence of some conversations with patients, that a proportion of women (over 40%) seemed to have a preference for a female rather than a male doctor. We therefore included an attribute designed to enable us to value any preferences amongst women with such a preference. This was important, because all the hospital consultants at Leicester Royal Infirmary were all male, so women could not select a female hospital doctor. In contrast within primary care there was more scope for self selection of a female doctor. After going through

¹ This wording appeared in the preamble to the questionnaire to encourage people to factor in 'cost to you' in their decision making.

this exercise the project steering committee considered which attributes should be included, paying particular attention to ensuring that all the attributes clearly delineating the two models of provision were included. The attributes, and levels selected for each of the attributes, are as indicated in table 3.

The design of the DCE questionnaire.

The package SPEED was used to generate a range of choice scenarios. Checks were then made to ensure attributes were not correlated using SPSS. Attention was also paid to other objectives of good design i.e. minimising level imbalance and overlap (Huber and Zwerina 1996). In any future DCEs I undertake, I now know that some of the approaches to design have been improved upon (in relation to statistical efficiency), so I would ensure that I use the new state of the art approach to questionnaire design, involving orthogonal arrays. Nonetheless, the DCE questionnaire was thoughtfully designed, and a constant comparator was used for choice scenarios. Roughly half the sample of returned questionnaires contained the first half of the choice scenarios generated by SPEED, whilst the other half contained the remainder. The design was also ordered in such a way as to help prevent respondents being influenced by ‘ordering effects’ (Ryan et al 1998), by rotating the order of listed attributes for the same pairwise choices. Thus in total there were 12 variants of the questionnaire, reflecting the 2 variants required because of the use of a constant comparator, and because I wanted to ensure that each of the 6 attributes had a fairly equal likelihood of being placed first on the list for choices (thereby trying to minimise any potential impact from ordering effects). Consistency type rationality checks were also included in all the variants of the questionnaires.

Results.

All the econometric analysis has been undertaken using a Random Effects Probit model using STATA. A number of models were undertaken which are detailed below (together with supporting information which helps to shed light on the findings).

1) Basic Model (No sub-group analysis).

Table 4.

Attribute.	Coefficient.	P > [z]	Willingness to Pay (WTP)
Difference in type of Doctor (Value Consultant vs. GP)	0.34313383	0.000	£62.53
Difference in type of Doctor (Value Male vs. Female).	-0.2785191	0.002	-£50.76
Difference in time spent waiting to see doctor (impact of a day)	-0.0204779	0.000	-£3.73
How often you get to see the same doctor (all of the time - half of the time).	0.3718856	0.000	£67.77
How often you get to see the same doctor (half of the time – none of the time).	0.4205787	0.001	£76.65
How long you have to wait for test results (impact of a day)	-0.0294737	0.000	-£5.37

Cost to you.	-0.0054873	0.000	
Constant	0.36677008	0.001	

Given the coding we ascribed to the dependent and independent variables these findings have the following interpretation. All the coefficients appear to be highly significant and consistent with our priors about the signs of the coefficients. They suggest that the *average* respondent is willing to pay £62.53 in order to have a Consultant rather than a GP, but that in contrast she would be WTP £50.76 to have a female rather than a male consultant. Avoiding an extra day waiting to see the doctor is worth £3.73 per day to the average respondent, whilst avoiding an extra day waiting for test results is worth £5.37. Patients also seem to place a value upon continuity of care, with the difference between getting to see the same doctor all of the time rather than half of the time being valued at £67.77, whilst a difference between getting to see the same doctor half of the time rather than none of the time is valued at £76.65. WTP estimates here assume that it is legitimate to assume that the coefficient relating to ‘cost to you’ can be used for the purposes of normalising the value of other changes in other attributes into monetary terms. However, some of the econometric findings later on in this paper make the accuracy of the WTP figures open to question, because of the number of respondents who say they did not factor differences in the ‘Cost to you’ attribute when decision making (table 11). An important part of this research therefore was methodological, investigating *one aspect of the robustness of estimating willingness to pay using DCEs.*

Preferences for a female doctor.

The following question was posed and respondents responses are as indicated:

Question posed: Do you have a preference for seeing a male or female doctor about a period problem?

Table 5.

Answer	Number responding in this way
Strong preference for male	0 (0%)
Some preference for male	4 (c. 3.2%)
No preference	65 (c. 52.4%)
Some preference for female	39 (c.31.5%)
Strong preference for female	12 (c. 9.7%)
No response	4 (c. 3.2%)

These findings indicate that many respondents c.41% had some form of a preference for seeing a female doctor, model 2 below derives the coefficient relating to the sex of the doctor only for those women with a preference for a female doctor.

2) Basic model (but sex of doctor only for those with preference for a female doctor).

Sub-group variable: The value of the coefficient upon this attribute purely for those respondents who indicated either that they had “Some preference for a female” or “Strong preference for a female doctor.”²

Interaction variable 1 (for this attribute)

The data relating to differences in the type of Doctor (Value Male vs. Female) was multiplied by the following interaction variable:

D = 1: If “Some preference for a female” or “Strong preference for a female.”
D = 0: Otherwise.

Table 6.

Attribute.	Coefficient.	P > [z]	WTP.
Difference in type of Doctor (Value Consultant vs. GP).	0.3620429	0.000	£60.46
Difference in type of Doctor (Value Male vs. Female) for those with a preference for a female doctor.	-0.8994709	0.000	-£150.21
Difference in time spent waiting to see doctor (impact of a day).	-0.0215347	0.000	-£3.60
How often you get to see the same doctor (all of the time – half of the time).	0.3658036	0.000	£61.09
How often you get to see the same doctor (half of the time – none of the time).	0.4473158	0.000	£74.70
How long you have to wait for test results (impact of a day).	-0.03327	0.000	-£5.56
Cost to you.	-0.0059882	0.000	
Constant.	0.3751528	0.001	

The interpretation of the WTP figures is as for model 1, the only difference is that here the impact upon WTP of having a female rather than a male doctor is derived only for those with a preference for a male rather than a female doctor. Clearly although most coefficients have changed only marginally, the impact of deriving the coefficient on the impact of a male rather than a female doctor only for those with a preference for a female doctor is that its value rises to -£150.21 (expected intuitively).

3) Basic model (but sex of doctor only for those with preference for a female doctor, divided into some preference and strong preference).

Sub group variables: The value of the coefficient upon this attribute relating to differences purely for those respondents who indicated either that they had “Some preference for a female” or “Strong preference for a female.”

² It should be noted that this model was adopted because with only 4 respondents indicating a preference for a male rather than female doctor (and all of them having ‘some’ rather than a ‘strong’ preference), not unsurprisingly an earlier model taking into account the influence of a preference for a male doctor also, had an insignificant coefficient relating to a preference for a male doctor.

Interaction variable 1 (for this attribute)

D = 1: If “Some preference for a female.”

D = 0: Otherwise.

Interaction variable 2 (for this attribute)

D = 1: If “Strong preference for a female.”

D = 0: Otherwise.

Table 7.

Attribute.	Coefficient.	P > [z]	WTP.
Difference in type of Doctor (Value Consultant vs. GP).	0.3633577	0.000	£59.53
Difference in type of Doctor (Value Male vs. Female) for those with some female preference.	-0.4583326	0.002	-£75.10
Difference in type of Doctor (Value Male vs. Female) for those with strong female preference.	-2.231853	0.000	-£365.68
Difference in time spent waiting to see doctor (impact of a day).	-0.0226761	0.000	-£3.72
How often you get to see the same doctor (all of the time – half of the time).	0.3217041	0.002	£52.71
How often you get to see the same doctor (half of the time – none of the time).	0.4809783	0.000	£78.81
How long you have to wait for test results (impact of a day).	-0.037007	0.000	-£6.06
Cost to you.	-0.0061033	0.000	
Constant.	0.3539776	0.004	

This model is very similar to model 2. Here though we have two interaction variables. One of them provides information on peoples WTP for a difference in type of doctor (Value Male vs. Female) for those with some female preference for a female doctor. The other gives WTP for a difference in type of doctor (Value Male vs. Female) for those with a strong preference for a female doctor. The WTP figures are £365.68, and £75.10 for those with a strong as opposed to some preference for a female doctor respectively, for a female doctor. The interpretation of the other variables is similar to model 2, and it is notable that most of the other coefficients are not very different again. Once again these results appear to make intuitive sense given respondents stated preferences (table 5). These findings suggest that there is *a significant minority of women who in this clinical context*, do have a preference (either some or a strong preference) for having a female rather than male doctor. This preference cannot currently be met if women are dealt with by hospital doctors at Leicester Royal Infirmary (all male). We thus wanted to see how much these preferences could be entertained in primary care (see below):

Question posed: If you have a preference, can your **GP surgery** meet this preference?

There were 55 respondents who indicated they had a preference in terms of the sex of the doctor they see about a period problem, and responses to the above question were:

Table 8.

Answer	Number responding in this way
Yes	29 (c.52.7%)
No	8 (c. 14.5%)
Sometimes	16 (c.29.1%)
Don't know	2 (c.3.6%)

These are reassuring findings for those who might favour greater management in primary care of period problems. They suggest that women's preferences for a female GP can usually be met (should they have one), by the new more primary care orientated models of provision for women with period problems. There is some other evidence we gathered though at the very beginning of section B of the questionnaire that also sheds some light on gender preferences. The following question was posed:

When you answered this questionnaire did **one** thing matter to you more than anything else?

- Yes
- No

(Answers in table 9 below):

Table 9.

Answer	Number responding in this way
Yes	96 (77.4 %)
No	22 (17.7 %)
No response	6 (4.8 %)

If Yes, which **one** mattered most? **If No**, go to the next box.

- Differences in the type of doctor you see (GP or Consultant)
- Differences in how long I have to wait for results
- Differences in the sex of the doctor you see (Male or Female)
- Differences in how often I would get to see the same doctor
- Differences in time spent waiting for an appointment to see the doctor
- Differences in 'cost to you'

If Yes, did you ignore the other things on the list?

- Yes
- No
- Sometimes

The question was designed to elicit information about whether there was evidence of Lexicographic preferences or some form of dominance in relation to preferences. Moreover, we wanted to establish which attributes were associated with more dominant preferences. The following information could be gleaned from responses:

i) A respondent who replied indicating one thing did not matter more than anything else to the first part of the question, may not have any form of dominant preference for a particular attribute. In total 22 / 124 respondents (17.7%) fell into this category.

ii) A respondent who indicated that one thing mattered more than anything else, who ticked the box adjacent to one attribute only, and responded ‘Yes’ that they ignored other things on the list, is in effect indicating that they are behaving Lexicographically. In total 8 / 124 respondents (6.5%) fell into this category.

iii) A respondent who indicated that one thing mattered more than anything else, who ticked the box adjacent to one attribute only, and responded that they ‘Sometimes’ ignored other things on the list, may for some pairwise choices have some form of dominant preference. In total 40 / 124 respondents (32.3%) fell into this category.

iv) A respondent who indicated that one thing mattered more than anything else, who ticked the box adjacent to one attribute only, and responded that ‘No’ they did not ignore other things on the list, may value some attributes more than others but probably does not have a dominant preference. In total 34 / 124 respondents (27.4%) fell into this category.

v) A respondent who failed to answer the question completely or correctly (for example ticking more than one box adjacent to an attribute) could not have responses to this question assessed. In total 20 / 124 respondents (16.1%) fell into this category.

Details of how the above results break down by attribute are presented in table 10.

Table 10.

Attribute	(ii) above – Compatible with Lexicographic preference	(iii) above – Compatible with some form of dominant preference for some choices on occasions	(iv) above – Preferences expressed but probably not a dominant preference
The type of doctor you see	0 (0%) ³	1 (2.5%)	3 (8.8%)
How long you have to wait for test results	2 (25%)	14 (35%)	10 (29.4%)
The sex of the doctor you see	0 (0%)	6 (15%)	3 (8.8%)
How often you get to see the same doctor	0 (0%)	3 (7.5%)	1 (2.9%)
Time waiting for an appointment to see the doctor (either the GP or Consultant)	2 (25%)	15 (37.5%)	9 (26.5%)
Cost to you	4 (50%)	1 (2.5%)	8 (23.5%)

³ Percentages in this table relate to percentage of respondents who indicated the type of preference indicated by the column heading for the attribute in question, as a proportion of respondents indicating a preference, and a preference for just one attribute, who also indicated whether or not they ignored other things on the list (so that they could be assigned to one of the 3 columns in the table). Overall 82 / 124 respondents (66.1%) fulfilled all these criteria.

Total	8	40	34

The implications of our findings are that estimates of WTP for the gender of the doctor suggest a relatively high WTP for a female rather than a male doctor, for the 41.2% of respondents who indicated they had some form of preference for a female doctor. However, none of the respondents responded to the above question in a manner indicative of a Lexicographic preference for a female doctor. This is despite the fact that it is not uncommon with conjoint analyses to obtain evidence suggestive of Lexicographic preferences (Bryan et al 1998; Scott et al (1998). Amongst respondents categorised as having preferences compatible with some form of dominant preference, 6 - just under 1/6th of respondents (15%), had such a preference for the sex of the doctor attribute. Given that there were 6 attributes, this does not suggest differences in this attribute was a major priority in the sample of respondents indicating they ‘Sometimes’ ignored other things on the list. In the group of respondents who indicated a preference, but indicated they had not ignored other things on the list, only 3 (8.8%) indicated a preference for the ‘sex of the doctor you see attribute.’ These findings may indicate that whilst women may have some preference or a strong preference for seeing a male rather than a female doctor, it is rarely an overriding preference, and clinical issues may be of more importance to many women. It may also be that WTP estimates may be inflated (see below).

Cost to you.

4) Basic model (but cost to you is derived for 3 separate groups, those who said 'Yes' it did influence their choices; those who said 'No' it did not; and those who said it ‘Sometimes’ did).

Table 11 utilises more data responses from Section B of the questionnaire. We posed the following question: Did differences in ‘cost to you’ for options A and B influence your choices?

Table 11.

Answer	Number responding in this way
Yes	25 (c. 20.2%)
No	44 (c.35.5%)
Sometimes	51 (c.41.1%)
No response	4 (c. 3.2%)

The issue we are trying to address here is whether people are factoring in the actual level of ‘cost to you’ when making a decision about whether to choose option A or B. That 35.5% of respondents say ‘No’ is of concern, if they do not factor it into their decision making, the coefficient will be underestimated. This will result in inflated estimates of WTP, if we try to derive WTP estimates using it.

We assume that money is of value to everyone, which is not an unreasonable assumption from an economic perspective. Thus we assume any complete failure to take into account differences in ‘cost to you’ should be attributable to people ignoring the attribute perhaps because they either feel such a ‘cost to you’ should not apply, or that they feel in reality it would not apply to them. Someone who indicated that they

sometimes took differences in ‘cost-to-you’ into account may be acting completely rationally (because some choice options are such that respondents for example did not face a difference in ‘cost to you’ for a choice). In these circumstances it would be reasonable to factor out the differences in such an attribute, from decision making. However, the presence of those who factor out ‘cost to you’ from their decision making completely is worrying, it will distort estimates of WTP. Thus we use the following approach to derive the coefficients relating to this ‘cost to you’ attribute.

Sub group variables: We derive the ‘cost to you’ variable for 3 different subgroups of respondents.” We multiply the data on differences in ‘cost to you’ by 3 separate interaction variables:

Interaction variable 1 (for this attribute)

D = 1: If “Yes” it did influence their choices.
D = 0: Otherwise.

Interaction variable 2 (for this attribute)

D = 1: If “Sometimes” it did influence their choices
D = 0: Otherwise.

Interaction variable 3 (for this attribute)

D = 1: If “No” it did not influenced their choices
D = 0: Otherwise.

Having done this we obtained the results in table 12.

Table 12.

Attribute	Coefficient	P > [z]	WTP – For respondents who reply ‘yes’ they take this into account when making decisions	WTP – For respondents who reply they ‘sometimes’ take this into account when making decisions	WTP – For respondents who reply they ‘No’ they do not take this into account when making decisions⁴
Difference in type of Doctor (Value Consultant vs. GP)	0.3553407	0.000	£16.95	£56.30	£273.93
Difference in type of Doctor (Value Male vs. Female).	-0.2696308	0.004	-£12.86	-£42.72	-£207.86
Difference in time spent waiting to	-0.0213785	0.000	-£1.02	-£3.39	-£16.48

⁴ Data in this column must be treated with caution as ‘cost to you’ for the ‘No’ group is not significant - P = .317

see doctor (impact of a day)					
How often you get to see the same doctor (all of the time - half of the time).	0.3710669	0.000	£17.70	£58.79	£286.05
How often you get to see the same doctor (half of the time – none of the time).	0.4433379	0.000	£21.15	£70.24	£341.77
How long you have to wait for test results (impact of a day)	-0.0303694	0.000	-£1.45	-£4.81	-£23.41
Cost to you (for the group that says 'yes' their choices were influenced by this attribute).	-0.0209635	0.000			
Cost to you (for the group that says their choices were 'sometimes' influenced by this attribute).	-0.00631118	0.000			
Cost to you (for the group that says 'no' their choices were not influenced by this attribute).	-0.0012972	0.317			
Constant	.3739789	0.001			

The findings here are seriously worrying for those who want to use DCEs to estimate WTP, the above shows that estimates of WTP can be very influenced by the extent to which respondents factor in differences in the level of this attribute into their decision making. It could be that 'hypothetical' bias, or perhaps 'strategic' bias (amongst respondents who disagree with paying for healthcare at the point of use), could distort estimates of WTP, as could other factors (Ratcliffe 2000).

5) Basic model (but cost to you is derived for 3 separate groups, i.e. for respondents who said their income was about the same; those who said it had gone down; those who said that it had gone up).

The following question was posed in Section B of the questionnaire: Overall what has happened to you **household** income (after deducting income tax and national insurance) in the last year?

Table 13.

Answer	Number responding in this way
Stayed about the same	52 (c. 41.9%)
Gone down	34 (c.27.4%)
Gone up	31 (c.25%)
No response	7 (c. 5.6%)

Here we test the premise that trends in individuals income may impact upon their willingness to bare a ‘cost to you.’ We use the following approach to derive the coefficients relating to this ‘cost to you’ attribute:

Sub group variables: We derive the ‘cost to you’ variable for 3 different subgroups of respondents.” We multiply the data on differences in ‘cost to you’ by 3 separate interaction variables:

Interaction variable 1 (for this attribute)

D = 1: If income is about the same.

D = 0: Otherwise.

Interaction variable 2 (for this attribute)

D = 1: If income had gone down.

D = 0: Otherwise.

Interaction variable 3 (for this attribute)

D = 1: If income had gone up.

D = 0: Otherwise.

The results in table 14 were obtained:

Table 14.

Attribute	Coefficient	P > [z]	WTP – Using coefficient for respondents whose income is about the same	WTP – Using coefficient for respondents whose income has gone down	WTP – Using coefficient for respondents whose income has gone up ⁵
Difference in type of Doctor (Value Consultant vs. GP)	0.349076	0.000	£59.03	£48.40	£141.98
Difference in type of Doctor (Value Male vs. Female).	-0.2633462	0.003	-£44.54	-£36.51	-£107.11

⁵ Cost to you for those whose income had gone up is not significant (2 tailed test 5% level: P=0.066) thus results in this column need to be treated with caution.

Attribute	Coefficient	P > [z]	WTP – Using coefficient for respondents whose income is about the same	WTP – Using coefficient for respondents whose income has gone down	WTP – Using coefficient for respondents whose income has gone up⁵
Difference in time spent waiting to see doctor (impact of a day)	-0.0203778	0.000	-£3.45	-£2.83	-£8.29
How often you get to see the same doctor (all of the time - half of the time).	0.3497169	0.000	£59.14	£48.49	£142.24
How often you get to see the same doctor (half of the time – none of the time).	0.4364134	0.000	£73.80	£60.51	£177.50
How long you have to wait for test results (impact of a day)	-0.030117	0.000	-£5.09	-£4.18	-£12.25
Cost to you (for the group that indicated their income was about the same).	-0.0059131	0.000			
Cost to you (for the group that indicated their income had gone down).	-0.0072121	0.000			
Cost to you (for the group that indicated their income had gone up).	-0.0024587	0.066			
Constant	0.3565056	0.002			

The analysis does lend some support for the view that trends in income may impact upon peoples WTP, however the big difference may be between those whose income has risen not stayed the same (whose WTP appears to have risen), and not between those whose income has fallen rather than stayed the same (whose WTP appears little affected) - but note footnote 5.

6) Basic model (but cost to you is derived for 3 separate groups, i.e. for respondents who said their income was above average; those who said it was about average; and those who said it was below average.

Sub group variables: We derive the ‘cost to you’ variable for 3 different subgroups of respondents.” We multiply the data on differences in ‘cost to you’ by 3 separate interaction variables:

Interaction variable 1 (for this attribute)

D = 1: If income is above average.

D = 0: Otherwise.

Interaction variable 2 (for this attribute)

D = 1: If income is average

D = 0: Otherwise.

Interaction variable 3 (for this attribute)

D = 1: If income is below average.

D = 0: Otherwise.

Earlier in the paper in table 2, details of the responses to the question about respondents income levels was presented. The findings here in table 15 though are somewhat counter-intuitive because they are significant but also appear to suggest that those with below average incomes have higher WTP than those on average incomes. The formation of the dummy variables was checked to ensure that an error had not arisen during data preparation (and no error was detected).

Table 15.

Attribute	Coefficient	P > [z]	WTP - for those indicating their income was above average	WTP – for those indicating their income was about average	WTP - for those indicating their income was below average
Difference in type of Doctor (Value Consultant vs. GP)	0.358037	0.000	£129.54	£42.33	£48.92
Difference in type of Doctor (Value Male vs. Female).	-0.2612446	0.004	-£94.52	-£30.89	-£35.69
Difference in time spent waiting to see doctor (impact of a day)	-0.0200219	0.000	-£7.24	-£2.37	-£2.74
How often you get to see the same	0.3604552	0.000	£130.42	£42.62	£49.25

Attribute	Coefficient	P > [z]	WTP - for those indicating their income was above average	WTP – for those indicating their income was about average	WTP - for those indicating their income was below average
doctor (all of the time - half of the time).					
How often you get to see the same doctor (half of the time – none of the time).	0.4304988	0.000	£155.76	£50.90	£58.82
How long you have to wait for test results (impact of a day)	-0.0295311	0.000	-£10.68	-£3.49	-£4.03
Cost to you (for the group that indicated their income was above average).	-0.0027639	0.015			
Cost to you (for the group that indicated their income was about average).	-0.008458	0.000			
Cost to you (for the group that indicated their income was below average).	-0.0073193	0.000			
Constant	0.3512729	0.002			

7) Model with sex of the doctor for those with a preference for a female doctor (but cost to you is derived for 3 separate groups. Those who said ‘Yes’ it did influence their choices; those who said ‘No’ it did not; and those who said it sometimes did).

The coefficients in table 16 are obtained using the specified interaction variables detailed under model 2 and model 4 previously. The data below only derives the coefficient on the sex of the doctor you see for women with a preference (whether it be some preference or a strong preference) for a female doctor. It is combined with the ‘cost-to-you’ variable divided into the 3 possible categories (as in model 4), to show how estimates of WTP (for those with a preference for a female doctor) are sensitive to whether or not respondents actually factor in the ‘cost-to-you’ variable when they make their choices. Once again (see below) they illustrate a wide

discrepancy in results contingent upon whether respondents factor in 'cost to you' into their decision making (but note footnote 6).

Table 16.

Attribute	Coefficient	P > [z]	WTP – for those indicating 'Yes' it did influence their choices	WTP – for those indicating it 'Sometimes' influenced their choices	WTP – for those indicating 'No' it did not influence their choices ⁶
Difference in type of Doctor (Value Consultant vs. GP)	0.3714541	0.000	£18.06	£53.78	£185.76
Difference in type of Doctor (Value Male vs. Female) for those with a preference for a female	-0.8259737	0.000	-£40.15	-£119.58	-£413.07
Difference in time spent waiting to see doctor (impact of a day)	-.0222016	0.000	-£1.08	-£3.21	-£11.10
How often you get to see the same doctor (all of the time - half of the time).	0.3683366	0.000	£17.91	£53.33	£184.21
How often you get to see the same doctor (half of the time – none of the time).	0.4628211	0.000	£22.50	£67.01	£231.46
How long you have to wait for test results (impact of a day)	-0.0334025	0.000	-£1.62	-£4.84	-£16.70
Cost to you (for the group that indicated 'Yes' it did influence their choices).	-0.0205699	0.000			
Cost to you (for the group that	-0.0069072	0.000			

⁶ Figures in this column need to be treated with caution given that 'cost to you' answer 'No' is not significant (P=0.123).

Attribute	Coefficient	P > [z]	WTP – for those indicating ‘Yes’ it did influence their choices	WTP – for those indicating it ‘Sometimes’ influenced their choices	WTP – for those indicating ‘No’ it did not influence their choices ⁶
indicated it ‘Sometimes’ influenced their choices).					
Cost to you (for the group that indicated ‘No’ it did not influence their choices)	-0.0019996	0.123			
Constant	0.37271	0.002			

8) Model with sex of the doctor only for those with some preference for a female doctor and those who had a strong preference for a female doctor (but cost to you is derived for 3 separate groups. Those who said ‘Yes’ it did influence their choices; those who said ‘No’ it did not; and those who said it sometimes did).

This is like model 7 but the coefficient on preferences for a male doctor is represented separately for those with some preference, and for those with a strong preference (using the interaction variables as in model 3 not model 2, with those from model 4). Findings in table 17 suggests that strength of preference may be a major determinant of WTP, but that also WTP estimates are much affected by the extent to which ‘cost to you’ is factored into decision making.

Table 17.

Attribute	Coefficient	P > [z]	WTP – for those indicating ‘Yes’ it did influence their choices	WTP – for those indicating it ‘Sometimes’ influenced their choices	WTP – for those indicating ‘No’ it did not influence their choices ⁷
Difference in type of Doctor (Value Consultant vs. GP)	0.3817591	0.000	£17.89	£55.28	£173.76
Difference in type of Doctor (Value Male vs. Female) for those with	-0.3977337	0.007	-£18.64	-£57.60	-£181.03

⁷ Figures in this column need to be treated with caution again given that ‘cost to you’ answer ‘No’ is not significant (P = 0.107).

Attribute	Coefficient	P > [z]	WTP – for those indicating ‘Yes’ it did influence their choices	WTP – for those indicating it ‘Sometimes’ influenced their choices	WTP – for those indicating ‘No’ it did not influence their choices ⁷
‘some’ preference for a female					
Difference in type of Doctor (Value Male vs. Female) for those with a ‘strong’ preference for a female	-2.185157	0.000	-£102.41	-£316.44	-£994.56
Difference in time spent waiting to see doctor (impact of a day)	-0.0232306	0.000	-£1.09	-£3.38	-£10.61
How often you get to see the same doctor (all of the time – half of the time).	0.3338239	0.001	£15.65	£48.34	£151.94
How often you get to see the same doctor (half of the time – none of the time).	0.4992137	0.000	£23.40	£72.29	£227.21
How long you have to wait for test results (impact of a day)	-0.0368802	0.000	-£1.73	-£5.34	-£16.79
Cost to you (for the group that indicated ‘Yes’ it did influence their choices).	-0.0213367	0.000			
Cost to you (for the group that indicated it ‘Sometimes’ influenced their choices).	-£0.0069054	0.000			
Cost to you (for the group that indicated ‘No’ it did not influence	-0.0021971	0.107			

Attribute	Coefficient	P > [z]	WTP – for those indicating ‘Yes’ it did influence their choices	WTP – for those indicating it ‘Sometimes’ influenced their choices	WTP – for those indicating ‘No’ it did not influence their choices ⁷
their choices)					
Constant	0.3487504	0.005			

Conclusions.

These findings taken overall suggest that perhaps particularly for some health problems of a sensitive nature women may feel more comfortable with and have a preference for a female doctor. The extent to which this is the case may be overstated in some of the willingness to pay figures presented here as indicated. There must also now be serious concerns about the robustness of estimating willingness to pay using conjoint analysis (particularly in the UK where healthcare is free at the point of use and willingness to pay questions may therefore not seem realistic to many respondents). Future work (and I have a project ongoing which is looking at this), should also see how sensitive estimates of willingness to pay obtained using conjoint analysis are to the way in which the attribute included for this purpose is described. At the moment though the reliability of many estimates of willingness to pay obtained using conjoint analysis must be open to question.

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