



**Who is More Likely to Use Doctor-Rating Websites, and Why?**  
**A cross sectional study in London.**

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2012-001493
Article Type:	Research
Date Submitted by the Author:	01-Jun-2012
Complete List of Authors:	Galizzi, Matteo; London School of Economics, LSE Health Miraldo, Marisa; Imperial College London, Business School Stavropoulou, Charitini; University of Surrey, Health Care Management Desai, Mihir; Imperial College London, Medicine Jayatunga, Jeevana; Imperial College London, Medicine Joshi, Mitesh; Imperial College London, Medicine Parikh, Sunny; King's College London, Medicine
<b>Primary Subject Heading</b>:	Health economics
Secondary Subject Heading:	Health policy
Keywords:	HEALTH ECONOMICS, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, World Wide Web technology < BIOTECHNOLOGY & BIOINFORMATICS

SCHOLARONE™  
 Manuscripts

Only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Who is More Likely to Use Doctor-Rating Websites, and Why? A cross sectional study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stravopoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

**Declaration:** All authors have completed the Unified Competing Interest form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

**Copyright statement:** The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, a worldwide licence to the Publishers and its licensees in perpetuity, in all forms, formats and media (whether known now or created in the future), to i) publish, reproduce, distribute, display and store the Contribution, ii) translate the Contribution into other languages, create adaptations, reprints, include within collections and create summaries, extracts and/or, abstracts of the Contribution, iii) create any other derivative work(s) based on the Contribution, iv) to exploit all subsidiary rights in the Contribution, v) the inclusion of electronic links from the Contribution to third party material where-ever it may be located; and, vi) licence any third party to do any or all of the above.

## Who is More Likely to Use Doctor-Rating Websites, and Why? A cross-sectional study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stravopoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

### Article summary

#### Article focus:

- To explore the extent at which doctor-rating websites are known and used among the general population.
- To understand the main predictors of what makes people aware of, and willing to use doctor-ratings websites.

#### Key messages:

- The share of the general public which uses doctor-rating websites is still quite low, although significantly higher than what previously documented by the literature.
- Elderly, subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The doctor-patient relationship is a significant predictor of patients' awareness of, and intention to use, doctor-rating websites.

#### Strength and Limitations:

- We provide for the first time direct evidence on the determinants of people's awareness of and willingness to use doctor-rating websites.
- The relatively small and non-representative sample size in one borough of London limits the possibility to immediately generalise the results of the analysis to a national level.

### Abstract

**Objectives:** To explore the extent at which doctor-rating websites are known and used among the general population. To understand the main predictors of what makes people aware of, and willing to use doctor-ratings websites.

**Design:** A cross-sectional study.

**Setting:** The Borough of Hammersmith and Fulham, London, England.

**Participants:** 200 individuals from the borough.

**Main outcome measures:** The likelihood of being aware of doctor-rating websites and the intention to use doctor-rating websites.

**Results:** The use and awareness of doctor-rating websites is still quite limited. Elderly, white British subjects, as well as respondents with higher income are less likely to use doctor-rating websites. The doctor-patient relationship also plays a key role in explaining awareness and intention to use the websites: the GP-patient gender concordance is associated with higher awareness of, and intention to use, the websites. Respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

**Conclusions:** Online rating websites can play a major role in supporting patients' informed decisions on which health care providers to seek advice from, thus potentially fostering patients' choice in health care. Subjects who seek and provide feedback on

1  
2  
3 doctor-ranking websites, though, are unlikely to be representative of the overall patients'  
4 pool. In particular, they tend to over-represent opinions from young, non white British,  
5 medium-low income patients who are not satisfied with their choice of the healthcare  
6 treatments and the level of information provided by their GP. Accounting for differences  
7 in the users' characteristics is important when interpreting results from doctor-rating sites.  
8

### 9 **Key messages**

- 10 • The share of the general public which uses doctor-rating websites is still quite low,  
11 although significantly higher than what previously documented by the literature.
- 12 • Elderly, subjects with white British background, as well as subjects with higher income  
13 are less likely to use doctor-rating websites.
- 14 • The GP-patient gender concordance is associated with higher awareness of, and intention  
15 to use, the websites.
- 16 • Subjects who feel that their GP explains things clearly and is a valuable source of clear  
17 information, are less likely to use online rating websites.
- 18 • Subjects who feel that they are more satisfied with the level of choice of healthcare  
19 treatments are less likely to use online rating websites.  
20  
21

22  
23 <sup>1</sup> London School of Economics, LSE Health and Centre for the Study of Incentives in Health

24 <sup>2</sup> Imperial College Business School

25 <sup>3</sup> University of Surrey

26 <sup>4</sup> Imperial College School of Medicine

27 <sup>5</sup> King's College London

28 \*Corresponding author: Marisa Miraldo. Email: [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk)  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## INTRODUCTION

Doctor-rating websites such as *NHS Choices* and *Dr Foster Intelligence* are a relatively recent phenomenon in the UK. Compared to other sources of healthcare information – such as official hospital statistics – the websites claim to be more user-friendly and easy to understand. In principle, doctor-rating websites can have a profound impact on public involvement and patients' choice in healthcare, as they potentially enable patients to make more informed decisions on where to seek healthcare, and thus to engage more often in active choices concerning their health and wellbeing.

In practice, however, relative little evidence is available on whether, and to what extent, doctor-rating websites are actually known and actively used in the UK. A study by the Kings Fund<sup>1</sup> explored the information sources used by patients in making decisions about where to receive care. Only 4% of the patients used the *NHS Choices* website, with the majority instead drawing information from their own experiences (41%), advice from GP (36%), advice from friends and family (18%), and other websites (1%). Similarly, a national survey on patients' choice by the Department of Health found that the *NHS Choices* website was only used by 5% of respondents.<sup>2</sup>

Moreover, very little is known about the profile of individuals who are more likely to make active use of these sites. Appleby and Alvarez<sup>3</sup> found that women in England desire patient choice more than men (69% to 56%), suggesting that women may also be more likely to use patient sources of information such as the rating sites. This is in line with findings from the US where women and younger adults are more active 'online health information seekers'.<sup>4</sup>

The apparently limited uptake of doctor rating in the UK calls into question how effective the existing websites may be as information exchange platforms from and to representative groups of patients.

Interventions that aim at enhancing the public engagement with health information on the Internet, and the representativeness of the users providing feedback online, require a better understanding of which characteristics drive the patients' awareness and actual use of doctor-rating websites.

The aim of this work is to provide evidence on the degree at which doctor ratings websites are known and used among the general public. It also aims to provide some novel insights on what appear to be the most significant predictors of the fact that people are aware of, and willing to use, doctor-ratings websites.

## SURVEY DESIGN AND DATA COLLECTION

We conducted a self-administered survey to directly collect quantitative data in the field. The field survey was considered the most appropriate administration mode to involve a sample of respondents from the general population. An online survey, in fact, by exclusively reaching the segment of active internet users, would have failed to address the main goal of the study, whether the users of doctor-rating websites are fairly representative of the general public.

## Questionnaire design

Prior to the data collection a pilot study was conducted. The aim of the pilot was to gain an understanding of the practicalities associated with giving out questionnaires and collecting responses. After listening to feedback from pilot respondents, and looking at results from the pilot study, several changes were made to make the questionnaire easier to understand. The changes related to content, phrasing and ordering of questions.

The final questionnaire contained questions on awareness and use of online rating websites; a wide range of socio-demographic and health variables; individual characteristics related to the access to healthcare services and the doctor-patient relationship; and internet use in general. A list of variables with a brief description is discussed in the Variables section and is summarised in Table 1 in the Appendix.

Closed questions were used, worded in a manner easy to understand. A limited number of responses were provided, either with binary options (e.g. yes or no), or with a numerical Likert scale ranging from 1 to 5, with a further option for “*Not sure*”.

## Ethical approval, informed consent and confidentiality of responses

We completed the checklist for research ethics approval from Imperial College London. As interviews were intended to be conducted in public places among respondents from the general population, the study involved no risk or harm of any type to respondents, no link with clinical data was expected to take place, and no incentives were going to be paid to respondents, the study fitted all the criteria in the first stage checklist with no further formal application to the Imperial College Research Ethics Committee.

At the beginning of each interview, interviewers showed credentials as research assistants at the University of London, informed respondents that their answers were anonymous and would remain strictly confidential, and that all responses and data were going to be treated statistically and used for the purposes of scientific research only. Informed consent by respondents was then given at the beginning of each interview.

## Sample

The questionnaire was administered in June 2010 to a sample of respondents from the Borough of Hammersmith and Fulham, London. The sampling method used was convenience sampling, a form of non-probability sampling. Subjects were approached in public places and asked whether they wanted to take part in a survey on internet usage. To account for confounding variables, the questionnaire explicitly assessed a range of individual socio-demographic and behavioural characteristics to be used as controls in the statistical analysis (see section on Variables).

The sample size was calculated at a minimum number of 200 respondents to achieve a sufficient number of events to use maximum likelihood techniques in the statistical analysis. The target minimum sample size was readily achieved by the convenience sampling procedure, as only 68 subjects who were initially approached refused to take part to the survey, giving a response rate of around 74.6%.

While the convenience sampling in one borough of London, and the relatively small sample size limit the possibility to immediately generalise the results of the analysis to a

1  
2  
3 national level, the careful choice of the location for the fieldwork was dictated by the  
4 consideration that the borough of Hammersmith and Fulham comprises a mix of both  
5 affluent and deprived neighbourhoods, and a broad heterogeneity in ethnic background,  
6 two key dimensions we aimed to relate to doctor websites' awareness and intended usage.  
7

## 8 9 10 **DATA ANALYSIS**

### 11 **Descriptive statistics**

12  
13  
14 Comparing the sample with the Census data for the borough the mean age of our sample  
15 was slightly older than that for the borough (39.57 years compared to 35.2 years).<sup>5</sup> Our  
16 sample however was closer to the national mean age of 38.5 years. The range of ages  
17 seems to show a positive skew, with a greater frequency of people aged 40 years and  
18 under. This is consistent with the 2001 census data for Hammersmith and Fulham which  
19 showed the borough contained a larger proportion of young people aged 20-29 (23.8%)  
20 than the rest of England (12.66%). Age is an important demographic to consider when  
21 analysing our results as age has been shown to be important in internet usage.<sup>4</sup>  
22

23  
24 Also, the sample had a slightly greater proportion of females than the borough (54.44% to  
25 52% respectively), and a lower proportion of 'White British' ethnicity (48.79% compared  
26 to 58% for the borough). This is also significantly lower than figures for England, White  
27 British accounting for 87% of the population. The sample contained 28.99% non white  
28 respondents. This is higher than the 2001 census data for Hammersmith and Fulham  
29 which was 22% and significantly higher than the figures for England, showing non white  
30 ethnic groups accounting for 9% of the total population. Our sample, therefore, allows  
31 controlling for high heterogeneity in ethnic background even with a limited sample size.  
32

33  
34 One major difference in our sample was that 19.32% of respondents were unemployed  
35 compared to only 5% from the Census data for the borough. The high number of  
36 respondents who are unemployed is a result of the convenience sampling method which  
37 was used to select respondents, which may have over-represented people who were out of  
38 work and at home, and who had time to fill out the questionnaire. This feature is quite  
39 common in field surveys conducted with convenience sampling. Moreover an  
40 unemployment rate higher than the one documented in the 2001 Census survey was  
41 largely expected, due to the consequences of the economic and financial crisis after 2007.  
42

43  
44 The majority of actively working respondents reported an income within the £15-35,000  
45 bracket. Income is an important variable to control for in the analysis, as previous  
46 literature found that patients using the Internet were more educated and had higher  
47 incomes.<sup>6</sup>  
48

49  
50 Our sample had a high percentage of people with higher level qualifications: 46.24% of  
51 the sample had a university degree and 27.96% had a postgraduate degree. This is  
52 reflective of Hammersmith and Fulham, where 45% of the population have a qualification  
53 of degree level or higher, a figure which is significantly higher than in England, where  
54 only 19.8% have a degree or higher qualification.  
55

56  
57 **[Figure 1 in here]**  
58  
59

## Variables

The main aim of the empirical analysis is to explore the determinants of the individual awareness of, and attitude to use, doctor-ratings websites. The dependent variables (Y) of our empirical analysis are thus two:

- i) the likelihood of being aware of doctor-rating websites (*Awareness*), which is a binary variable (*Awareness*=1 if patient is aware, *Awareness*=0 otherwise);
- ii) the likelihood of the individual intention to use doctor-rating websites in the future (*IntentionToUse*), which is an ordered discrete dependent variable that assumes values equal to 1 if the respondent is not likely to use the websites in the future, 2 if is not sure, and 3 if is likely to use.

The explanatory variables ( $X_i$ ) include five groups of individual variables, namely:

- i) individual socio-demographic characteristics such as age (*Age*); gender (*Gender*); a set of dummies variables for ethnicity (*WhiteNonBritish*, *WhiteBritish*) with the non-white respondents taken as reference group; education (*Education*), taking values between 1 and 7 increasing with the highest level of attained formal education; income (*Income*), taking values between 1 and 6 increasing with the bracket level of pre-tax income;
- ii) a set of variables on the characteristics of the healthcare providers that the respondents consider important for making their decisions on where to receive health care, including the clinical performance of the healthcare providers (*HC\_ClinicalPerform*); the closeness to home (*HC\_CloseHome*); the familiarity with the doctor (*HC\_Familiarity*); the financial performance of the hospital (*HC\_FinPerform*); the reputation of the doctor (*HC\_GPReputation*); the accessibility of the hospital (*HC\_Access*); the past experience with the hospital (*HC\_PastExp*); the waiting lists (*HC\_Waiting*); and, finally, the rates of hospital-acquired complications (*HC\_HospComp*);
- iii) a set of variables on the sources of information that are important in making decisions about where to receive health care, including published hospital statistics (*SI\_HospStat*); online doctor-rating websites (*SI\_DoctorRating*); advice from the GP (*SI\_GPAdvice*); feedback from relatives or friends (*SI\_Family*); and, finally, past experience (*SI\_PastExp*);
- iv) two dummy variables which take value 1 if the gender and the age of the patient are the same, or within a comparable range, respectively, than the characteristics of her GP, and 0 otherwise (*GenderMatch*, *AgeMatch*);
- v) a set of variables that describe the respondents' feelings about their relation with their doctor, including the feeling that the doctor listens to their problems (*DOC\_Listens*); spends enough time in the consultation (*DOC\_Time*); explains things clearly (*DOC\_Explains*); is sociable and friendly (*DOC\_Friend*); and can be trusted (*DOC\_Trust*);
- vi) a variable indicating the level of participation of the respondents in their GPs' decisions (*Participation*);
- vii) a set of variables on patients' satisfaction with the level of choice in their healthcare decisions, and in particular for the choice of the GP (*SAT\_C\_GP*); of treatments (*SAT\_C\_Treatment*); of a doctor for an outpatient appointment (*SAT\_C\_Doc*); of an hospital for an outpatient appointment (*SAT\_C\_Hosp*); of an appointment time (*SAT\_C\_Time*);



- viii) a dummy variable controlling for whether the subjects had access to internet at home or at work (*WEB\_Access*);
- ix) in the estimation of the likelihood of the intention to use websites, an extra dummy variable controlling for whether the subjects were aware of the existence of doctor-rating websites (*AlreadyAware*)
- x) a dummy variable (*SameGP*) for whether the subject always asks to see the same GP.

## Methodology

Using STATA 11, we estimate a binary probit model for the awareness of doctor online rating websites (*Awareness*), and, an ordered probit for the likelihood of intention to use these websites (*IntentionToUse*).

The main idea beyond the binary probit regression is that the likelihood of observing a positive awareness of the websites (*Awareness*=1) can be modelled as:

$$\Pr (Y = 1|X_1, X_2, X_3, \dots, X_k) = \Phi (\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k) \quad (1)$$

Where  $\Phi$  is the cumulative standard normal distribution function,  $X_1, X_2, \dots, X_k$  are the above described explanatory variables, and  $\beta_0, \beta_1, \beta_2, \dots, \beta_k$  are the coefficients of the explanatory variables to be estimated, which can be immediately interpreted as determining whether the likelihood of observing awareness increases with the corresponding explanatory variable.

The binary probit model can be equivalently generalised to the case where more than two discrete outcomes are possible, using an ordered probit model. In such a case, threshold parameters shown by cut-points between the outcomes are estimated by the data together with the regression coefficients and help to match the probabilities associated with the outcome.<sup>7,8</sup> We in fact employ an ordered probit model to estimate the likelihood that the respondents to our survey intend to use online doctor-rating websites in the future (*IntentionToUse*).

## RESULTS AND DISCUSSION

### Missing data

The incomplete questionnaires were used and missing observations were considered for the questions not answered. From the sample 3.9% did not report their age, 2.43% their gender, 2.9% their ethnicity, 3.4% whether they had internet access, 6.34% did not report how many people they lived with, 3.41% did not report whether they had an outpatient appointment in the previous year.

Missing data was higher for income (15.1% of the sample), education (10.2% of the sample). Also, 27.31% of the respondents did not answer on the gender of their GP, 28.29% on the age and 29.37% on the ethnicity.

On the awareness only 1.46% of our sample did not answer to whether they were aware of the existence of online rating websites and 3.95% failed to answer on the likelihood of using these websites in the future.

## Results on awareness

Only 29 of our respondents were aware of the doctor-rating websites they were asked about. This corresponds to less than 15% of our sample, indicating that the use of these online sources is still quite limited in our sample, although significantly higher than what the previous studies have shown.<sup>1</sup>

We then used a probit regression to explore the possible characteristics that make patients more likely to be aware of the doctor-rating websites. Table 2 summarises the results.

[Table 2 in here]

Among the demographic factors, age and ethnicity were the only significant variables. Older individuals are less likely to be aware of the rating websites, which does not constitute a surprise, as they are usually less familiar with the use of internet in general. Although white British and white non-British respondents were sometimes less likely to be aware of the websites, the effect of these variables is not fully robust across all specifications. Other demographic factors, including income, education and gender were not significant predictors of awareness.

When considering the importance that individuals give to different information channels in order to decide on where to receive care, three sources were significant: clinical performance rates, the reputation of the doctor, and the hospital statistics. Those who consider the reputation of the doctor and the hospital statistics important in deciding where to receive care were more likely to be aware of the rating websites. This is consistent with the fact that individuals who give importance to these factors are more likely to seek for this information and therefore be aware of the websites that provide it. On the contrary, those who considered clinical performance rates important were less likely to be aware of the doctor-rating websites, perhaps signalling that those respondents may be more familiar with other sources of information, such as hospital statistics, for instance.

Finally, although the majority of the variables on doctor-patient relationship were not significant, the gender match between the GP and the patient predicted higher awareness of the website ratings. We see this as an interesting finding. The doctor-patient gender concordance has often been reported in the literature as a factor associated with higher patient satisfaction with the consultation as well as better outcomes.<sup>9</sup> If we interpret the gender match variable as an indication of satisfaction with the consultation, our finding indicates that being aware of the doctor-rating websites is not necessarily the result of a poor consultation. Instead, the Internet and the doctor are likely to be seen as complementary, rather than alternative, information channels.

Our evidence is consistent with recent findings from the literature. Indeed, a study by Stevenson and colleagues<sup>10</sup> shows that although patients use the Internet increasingly more, they show no intention of doing so with the aim of disrupting the existing balance of roles during the patient-doctor consultation. They all mentioned the Internet as an additional resource of health and healthcare information. Other evidence suggests that patients with hypertension who search for more information on the Internet, in addition to

1  
2  
3 that they receive from their doctor, may be more engaged in their treatment, and therefore  
4 more willing to adhere to medication prescribed by them.<sup>11</sup>  
5  
6

### 7 **Results on the likelihood to use online rating websites**

8  
9 Table 3 below summarizes several statistical specifications of the ordered probit model  
10 looking at the determinants of the likelihood that respondents to our survey declared their  
11 intention to use doctor-rating websites in the future.  
12

13  
14 **[Table 3 in here]**  
15

16  
17 Concerning socio-demographic variables, it turns out that white British, as well as  
18 respondents who reported income in higher brackets, said they were less likely to use  
19 doctor-rating websites. This result is partly in contrast to what found by the previous  
20 literature<sup>6 12 13</sup> and can signal that white British subjects and respondents with higher self-  
21 reported income may feel less in need of checking online doctor ratings, perhaps because  
22 they may also have private, or employer-paid, health insurance schemes, or because are in  
23 the position of directly accessing alternative sources of information through their networks  
24 of acquaintances. As the estimated effect of these variables appear to be robust across all  
25 empirical specifications, these findings seem to suggest that online doctor-rating websites  
26 are likely to be particularly attractive to subjects with non-white British ethnicity and less  
27 favoured economic background.  
28

29  
30 Among other socio-demographic variables, we do not find any effect of education, age  
31 and gender of the respondents on the likelihood of their intention to use (the results of the  
32 specifications including the age and gender variables are not reported in the table for the  
33 sake of space but are available from authors upon request). These results seem to suggest  
34 that while age and gender can be significant factors in explaining the use of Internet for  
35 health information,<sup>4</sup> they are not significant factors to explain the intention to use doctor-  
36 rating websites once subjects are made aware of their existence.  
37

38  
39 Of the characteristics of the healthcare providers that respondents perceived as important  
40 while making decisions where to receive healthcare, our data suggest that those who  
41 consider clinical performance and doctor reputation (in most specifications) as important  
42 factors, are more likely to use doctor-rating websites. These results are consistent with the  
43 nature of the information provided in these websites. Also, subjects who consider the  
44 familiarity with their doctor an important factor to decide where to seek healthcare, tend to  
45 be less likely to intend to use websites.  
46

47  
48 Concerning the role of the different sources of information on the decisions of where to  
49 seek healthcare, respondents who see published hospital statistics (and, sometimes also  
50 online doctor-rating websites) as important sources of information are more likely to use  
51 the rating websites. On the other hand, and interestingly, those for whom GP advice is an  
52 important source of information for decision making are less likely to use doctor-rating  
53 websites.  
54

55  
56 Also the nature of the doctor-patients relationship seems to play a key role in explaining  
57 whether respondents intend to use online rating websites. First, patients with GPs of the  
58 same gender tend to be more likely to use the websites. This seems consistent with the  
59  
60

1  
2  
3 analogous effect found for the likelihood of being aware of those websites, and together  
4 they point to the possible explanation that the doctor and the Internet may sometimes be  
5 seen as complementary, rather than alternative, information channels.<sup>12</sup> This interpretation  
6 is further confirmed by the finding that respondents for whom the doctor is able to listen  
7 to them, and who perceive the nature of the relationship with their GP as friendly, also  
8 tend to be more likely to use the websites.  
9

10  
11 On the other hand, there may be other dimensions in the patient-doctor relationship which  
12 seem to rather point to a “substitute” relationship with information on the Internet. For  
13 instance, respondents who feel that their doctor explains things clearly are less likely to  
14 use online rating websites, suggesting that when they are generally more satisfied with the  
15 feedback provided by their doctor they are less concerned about finding about alternative  
16 doctors and how they perform relative to each other.  
17

18  
19 This result on a “substitute relationship” is consistent with previous evidence by Diaz and  
20 colleagues<sup>6</sup> that found that 11% of their respondents said they would rather use the  
21 Internet ‘instead of seeing or speaking with their doctors’, and that 59% of respondents  
22 ‘did not discuss information with their doctors’. It also seems in line with the study by  
23 McMullan<sup>12</sup> that indicates that patients who become dissatisfied with the information  
24 provided to them by the health professionals are more likely to seek confirmation of the  
25 information given and additional information on the Internet.  
26

27  
28 Regarding other respondents’ attitudes within the patient-doctor relationship, it also  
29 transpires that the more autonomy patients have in their healthcare, the more likely they  
30 are to be willing to use the rating websites. This intuitive result is consistent with the  
31 evidence by McMullan<sup>12</sup> that a patient would look up health information before a  
32 consultation ‘to seek information to manage their own healthcare independently’. These  
33 may be the type of people who are ‘more likely to be health-oriented’ or ‘health  
34 conscious’, and therefore be more proactive in consultations.<sup>14</sup>  
35

36  
37 Concerning, finally, the interaction between levels of satisfaction for the healthcare  
38 services within the NHS, and the intention to use doctor-rating websites, it is interesting  
39 to note that those that have reported to be more satisfied with the level of choice of GP, and  
40 with the amount of choice of the hospital to receive outpatient appointments, are more  
41 likely to use these websites. These results may be considered as reinforcing the above  
42 discussed interpretation that some dimensions of the patient-doctor relationship may be  
43 “complementary” with online information. For instance, patients who are more satisfied  
44 with their GP because they feel the latter is more friendly and empathic may also be more  
45 likely to engage more actively with health and healthcare information more generally.  
46

47  
48 On the other hand, the respondents that are more satisfied with the level of choice of  
49 treatments are less likely to use the websites. Together with the above result, these  
50 findings suggest that the choice of doctors and providers may be seen as only instrumental  
51 for the choice of treatment, and therefore respondents that are happy with treatment choice  
52 levels are less likely to shop around for different doctors’ opinions.  
53

54  
55 Of course, the study was conducted on a relatively small sample in one borough of  
56 London which limits the possibility to generalise the findings. Yet, having chosen a  
57 borough which comprises a mix of ethnicities and both affluent and deprived  
58 neighbourhoods and having controlled for a range of characteristics in the analysis, makes  
59 the provided evidence of potential relevance under a much broader perspective.  
60

## CONCLUSIONS

The use of doctor-rating websites in our sample remains particularly low. Our findings suggest that older and more affluent people, as well as subjects of a white ethnic background, are less likely to use them.

One of the main results that seem to emerge from our empirical analysis is the importance of the doctor-patient relationship as a factor determining people's awareness or intention to use online websites. In particular, the GP-patient gender concordance is associated with higher awareness of, and intention to use, the websites, while respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

The existence of both "substitute" and "complementary" effects between the GP and the Internet information channels is not at all conflicting. In fact, they both indicate that the level of concordance achieved during the consultation is likely to define whether or not individuals will seek for further information channels, such as the Internet. When the outcome of a consultation does not satisfy the patient, the use of Internet fills the gap of information needs. The intention to use online doctor-rating websites in this case also indicates that these patients are likely to look at these websites with the aim of seeking for another clinician. Individuals who are satisfied with their GPs may also search these websites, but more as an additional information channel as they seem keener to engage more actively with health and healthcare information in general.

The findings of our study thus contribute also to the wider debate on the inter-relationships between Internet usage and the doctor-patient relationship.<sup>15 16 17</sup> The argument, sometimes addressed by the previous literature, that information on the Internet can threaten the trust relationship and the balance of roles between doctors and patients, seems a concern which is not supported by our evidence. If any, a potential challenge to the doctor-patient relation can only affect the patients who already feel dissatisfied with the ability of their doctor to listen to them and provide them enough information regarding their condition, or with the level of their choice for healthcare treatments.

The above, however, can hardly be seen as a serious threat by those who advocate a greater choice by patients. On the contrary, if the latter is indeed a priority in the health policy agenda, online information on healthcare providers should be seen as a stimulating opportunity to enhance patients' choice in healthcare, and public engagement with health information, especially for the less favoured segments of the population.

Our study shows, however, that subjects who seek and provide feedback on doctor-ranking websites are unlikely to be representative of the overall patients' pool. In particular, they tend to over-represent opinions from young, non white British, medium-low income patients who are not satisfied with their choice of the healthcare treatments and the level of information provided by their GP.

Accounting for differences in the users' characteristics is important when interpreting results from doctor-rating sites and when informing interventions that aim at enhancing the public engagement with health information on the Internet, and the representativeness of the users who seek and provide feedback on doctor-ratings.

1  
2  
3  
4  
5 **Data sharing:** technical appendix, statistical code and dataset available from the  
6 corresponding author at [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk). Consent for data sharing was not  
7 obtained but the presented data are anonymised and risk of identification is low.  
8

9  
10 All authors had full access to all the data in the study and take responsibility for the  
11 integrity of the data and the accuracy of the data analysis.  
12

13  
14 **Funding:** this piece of work has not received any specific funding.  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## REFERENCES

1. Dixon A, Robertson R, Appleby J, et al. Patient Choice. London: The Kings Fund 2010 [http://www.kingsfund.org.uk/publications/patient\\_choice.html](http://www.kingsfund.org.uk/publications/patient_choice.html)
2. Department of Health. Report of the National Patient Choice Survey, England. Crown 2008.
3. Appleby J, Alvarez A. Public Responses to NHS Reform. In British Social Attitudes Survey 22nd Report, London: Sage Publications 2005.
4. Ybarra M, Suman M. Help seeking behavior and the Internet: A national survey. *Int J Med Inform* 2006;**75**(1): 29-41.
5. Office for National statistics. 2001 Census: Key Statistics. 2001. Available from: <http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.doa=3&b=276755&c=hammersmith&d=13&e=15&g=334516&i=1001x1003x1004&m=0&r=1&s=1273150763921&enc=1&dsFamilyId=47>
6. Diaz JA, Griffith RA, Ng JJ, et al. Patients' use of the Internet for medical information. *J Gen Intern Med* 2002;**17**(3): 180-185.
7. Wooldridge J. Econometric analysis of cross section and panel data. MIT Press, 2001.
8. Cameron C, Trivedi PK. Microeconometrics Using STATA, Stata Press, 2007.
9. Bertakis KD. The influence of gender on the doctor-patient interaction. *Patient Educ Couns* 2009;**73**(3): 356-60.
10. Stevenson FA, Kerr C, Murray E, et al. Information from the Internet and the doctor-patient relationship: the patient perspective – a qualitative study. *BMC Fam Pract* 2007;**8**: 47.
11. Stavropoulou C. Perceived information needs and non-adherence: evidence from Greek patients with hypertension. *Health Expect* Published Online First: 17 April 2011. doi: 10.1111/j.1369-7625.2011.00679.x
12. McMullan M. Patients using the Internet to obtain health information: how this affects the patient-health professional relationship. *Patient Educ Couns* 2006;**63**(1-2): 24.
13. Cotten SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. *Soc Sc Med* 2004;**59**(9): 1795-1806.
14. Dutta-Bergman MJ. Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. *J Med Internet Res* 2004;**6**(2): e15.
15. Nwosu CR, Cox BM. The impact of the Internet on the doctor-patient relationship. *Health Informatics Journal* 2000;**6**(3): 156-161.
16. Broom A. Virtually He@lthy: The Impact of Internet Use on Disease Experience and the Doctor-Patient Relationship. *Quality Health Research* 2005;**15**(3): 325-345.
17. Gorrindo T. Web searching for information about physicians. *JAMA* 2008; **300**(2), 213.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49

**Appendix 1**  
**Table 1 Variable description**

<b>Label</b>	<b>Values</b>
<b>IntentionToUse</b>	Dummy variable =1 if Yes
<b>Awareness</b>	Ordered discrete variable ranging from 1 ="not likely to use" to 3="likely to use"
<b>HC_Waiting</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>HC_HospComp</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>HC_Clinical_Performance</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>HC_CloseHome</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>HC_Familiarity</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>HC_FinPerform</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>HC_GP_Reputation</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>HC_Access</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>HC_PastExp</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>SI_GP_Advice</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>SI_HospStat</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>SI_DoctorRating</b>	Ordered discrete variable ranging from 1 =not important to 5=very important



<b>SI_PastExp</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>SI_Family</b>	Ordered discrete variable ranging from 1 =not important to 5=very important
<b>Reliable</b>	Ordered discrete variable ranging from 1 =very unreliable to 5=very reliable
<b>DOC_Listens</b>	Dummy variable =1 if "I feel my doctor listens to my problems"
<b>DOC_Time</b>	Dummy variable =1 if "I feel my doctor spends enough time with me in each consultation"
<b>DOC_Explains</b>	Dummy variable =1 if "I feel my doctor explains things clearly"
<b>DOC_Friend</b>	Dummy variable =1 if "I feel my doctor is sociable and friendly"
<b>DOC_Trust</b>	Dummy variable =1 if "I feel I can trust in my doctor"
<b>Participation</b>	Ordered discrete variable. Value=1 if "My doctor always makes decisions for me", Value =6 I make decisions with my parents/spouse/relatives
<b>SAT_C_GP</b>	Ordered discrete variable ranging from 1 =strongly dissatisfied to 5=strongly satisfied
<b>SAT_C_Hosp</b>	Ordered discrete variable ranging from 1 =strongly dissatisfied to 5=strongly satisfied
<b>SAT_C_Doc</b>	Ordered discrete variable ranging from 1 =strongly dissatisfied to 5=strongly satisfied
<b>SAT_C_Treatment</b>	Ordered discrete variable ranging from 1 =strongly dissatisfied to 5=strongly satisfied
<b>SAT_C_Time</b>	Ordered discrete variable ranging from 1 =strongly dissatisfied to 5=strongly satisfied
<b>CB_AWARE</b>	Dummy variable =1 if aware of Choose &Book
<b>CB_Use</b>	Dummy variable =1 if has used Choose &Book
<b>WEB_Access</b>	Dummy variable =1 if has Internet Access at home or work
<b>AgeMatch</b>	Dummy variable =1 if gender matches GP age
<b>GenderMatch</b>	Dummy variable =1 if age matches GP age
<b>WhiteBritish</b>	Dummy variable =1 if White British
<b>WhiteNonBritish</b>	Dummy variable =1 if White Non British

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49

<b>Income</b>	Ordered discrete variable =1 if Income <15000; =6 if Income>95000
<b>Education</b>	Ordered discrete variable ranging from 1 to 7 increasing with level of highest attained education

For peer review only

**Table 2:** Probit model on the factors explaining individuals' awareness of doctor-rating websites

<i>Awareness</i>	Model 1	Model 2	Model 3	Model 4
Age	-.02511*	-.03802*		
Gender	0.17571	0.37698		
White British	-0.31364	-0.04029	-0.40867	-1.37686*
WhiteNonBritish	-.77154*	-0.51540	-0.73818	-1.49512*
Education	0.08598	0.22691	0.16062	0.15219
Income	-0.03388	-0.03182	-0.18586	-0.32047
HC_HospComp		0.09907	0.17904	0.13723
HC_Clinical_Performance		-0.24814	-0.34760	-.89496*
HC_Familiarity		-0.20002	-0.15916	-0.00744
HC_GP_Reputation		0.20240	0.23607	.88312*
SI_GP_Advice		0.07143	-0.06556	-0.24120
SI_HospStat		0.11735	0.17486	.78768*
SI_PastExp		-0.14996	0.06721	0.09103
SI_Family		-0.02373	-0.23585	-0.67718
DOC_Listens			-0.39510	-0.78662
DOC_Time			0.17592	-0.91318
DOC_Explains			0.38843	0.32532
DOC_Friend			-0.16654	0.78108
DOC_Trust			0.04683	0.30238
Participation			0.02650	0.22745
AgeMatch			0.41149	1.15968
GenderMatch			.60875*	0.83468
SameGP				-0.43671

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49

SAT_C_GP				0.34304
SAT_C_Hosp				0.03738
SAT_C_Doc				0.17756
SAT_C_Treatment				0.14192
SAT_C_Time				-0.09109
_cons	-0.17923	-0.00659	-0.70032	-3.12100
-----	-----	-----	-----	-----
	legend:		* p<0.05; **	p<0.01; ***
				p<0.001

peer review only

Table 3 Ordered Probit model on the factors explaining the likelihood to intend to use the doctor-rating websites.

IntentionToUse	Model I	Model II	Model III	Model IV	Model V	Model VI	Model VII	Model VIII	Model IX	Model X	Model XI
Awareness	-1.490098 (1.105938)	-1.46876 (1.086428)	-1.37799 (1.013997)	-1.39186 (1.014678)	-1.39135 (1.028182)	-1.32087 (0.964004)	-1.33837 (0.950678)	-1.30858 (0.883072)	-1.21886 (0.859385)	-1.26392 (0.858102)	-1.25845 (0.850407)
HC_Waiting	-0.0333763 (0.4812862)	-0.0289 (0.475927)	0.034038 (0.42562)	0.037041 (0.427061)	-0.00202 (0.404197)	0.037416 (0.351975)					
HC_HospComp	0.1258374 (0.4490633)	0.130149 (0.448609)	-0.14574 (0.389477)	-0.14176 (0.389321)	-0.17246 (0.378143)	-0.17163 (0.376829)	-0.16192 (0.364591)	-0.16609 (0.361465)			
HC_Clinical_Performance	1.27466* (0.706387)	1.24218* (0.664938)	1.108376* (0.567199)	1.114709** (0.566718)	1.084543** (0.552248)	1.068527* (0.542242)	1.049116** (0.507769)	1.051533** (0.506566)	1.013939** (0.473)	0.972573** (0.475465)	0.961459** (0.47394)
HC_CloseHome	0.0479294 (0.4304794)	0.071271 (0.404689)	-0.06446 (0.36145)								
HC_Familiarity	-0.6430315 (0.4431286)	-0.61777 (0.396589)	-0.50769 (0.346218)	-0.50751 (0.346708)		-0.55836* (0.330284)	-0.55738* (0.330004)	-0.56245* (0.324459)	-0.56886* (0.326828)	-0.59213* (0.330537)	-0.57454* (0.317614)
HC_FinPerform	-0.2879855 (0.5759051)	-0.32068 (0.523122)	-0.17394 (0.474874)	-0.1614 (0.471761)							
HC_GP_Reputation	0.531551 (0.4888328)	0.559182 (0.457822)	0.649998 (0.422641)	0.667459 (0.413469)		0.734803* (0.389075)	0.734723* (0.389097)	0.739415* (0.385034)	0.706219* (0.3866097)	0.690839* (0.385655)	0.686293* (0.379665)
HC_Access	0.0646001 (0.3598014)	0.063482 (0.358318)	0.126025 (0.335348)	0.106341 (0.314739)	0.128631 (0.307265)	0.128902 (0.309413)	0.135516 (0.303004)	0.146907 (0.272835)	0.14238 (0.260669)	0.157805 (0.2587)	0.167118 (0.255171)
HC_PastExp	0.0116506 (0.3126032)	0.009942 (0.309821)	-0.07334 (0.285021)	-0.069 (0.284343)	-0.07509 (0.280258)	-0.08766 (0.272015)	-0.07412 (0.240066)	-0.07626 (0.238735)	-0.06161 (0.236172)	-0.05774 (0.236731)	-0.05854 (0.236593)
SI_GP_Advice	-0.965477* (0.5812963)	-0.96164* (0.572932)	-0.68184 (0.478883)	-0.71602* (0.439781)	-0.71349* (0.431606)	-0.70949* (0.431902)	-0.6887* (0.381957)	-0.69106* (0.381335)	-0.73722** (0.368857)	-0.73987** (0.377419)	-0.73816* (0.379712)
SI_HospStat	1.430153** (0.7232476)	1.472196** (0.654768)	1.282785** (0.563935)	1.266714** (0.560111)	1.157914** (0.464421)	1.109429** (0.382154)	1.112091** (0.380992)	1.11389** (0.381585)	1.070698** (0.366592)	1.077707** (0.374138)	1.057476** (0.366079)
SI_DoctorRating	0.3509325 (0.5678123)	0.341427 (0.554121)	0.140798 (0.482839)	0.166676 (0.466254)	0.167322 (0.461632)	0.225253 (0.3595)	0.212759 (0.339169)	0.205901 (0.329077)	0.213284 (0.331575)	0.263376 (0.318113)	0.256045 (0.313808)
SI_PastExp	-0.2323052 (0.6857292)	-0.27113 (0.63673)	-0.33326 (0.61977)	-0.32871 (0.617586)	-0.31629 (0.620509)	-0.33499 (0.617278)	-0.33643 (0.617512)	-0.33403 (0.615972)	-0.33182 (0.595386)	-0.34589 (0.593174)	-0.21412 (0.321702)
SI_Family	0.0969089 (0.6530482)	0.100416 (0.654709)	0.153811 (0.644386)	0.144818 (0.640823)	0.129728 (0.635845)	0.147216 (0.631958)	0.143252 (0.630112)	0.140679 (0.62874)	0.17626 (0.566482)	0.149968 (0.563479)	
Reliable	0.8541392 (0.6146382)	0.836024 (0.610583)	0.998539* (0.553175)	0.950086** (0.481689)	0.93444* (0.485219)	0.904671* (0.455675)	0.91699** (0.441021)	0.931441** (0.410032)	0.951635** (0.389758)	0.951738** (0.391553)	0.968708** (0.383293)
DOC_Listens	2.783105* (1.595183)	2.701009* (1.459189)	2.107379 (1.28265)	2.050764* (1.240544)	2.200222* (1.196851)	2.186488* (1.190079)	2.191035* (1.186518)	2.203634* (1.177361)	2.115074* (1.142362)	2.276804** (1.12992)	2.254619** (1.115993)
DOC_Time	0.0028009 (0.9663045)	0.031698 (0.935949)	0.263194 (0.862893)	0.291105 (0.846794)	0.288719 (0.841739)	0.295651 (0.83964)	0.277058 (0.820967)	0.279926 (0.819897)	0.426324		

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49

	-2.873068**	-2.79747**	-2.93956**	-2.89406**	-2.9724**	-2.99408**	-3.01245***	-3.03793***	-3.01943***	-3.13156***	-3.08263***
DOC_Explains	(1.451857)	(1.322986)	(1.211433)	(1.183745)	(1.189955)	(1.187278)	(1.171195)	(1.136076)	(1.162068)	(1.153486)	(1.119211)
	1.476197	1.39654	1.262265	1.2366	1.44486*	1.500166*	1.514821**	1.526402**	1.530325**	1.712944**	1.66892**
DOC_Friend	(1.253959)	(1.084211)	(0.994411)	(0.987052)	(0.816683)	(0.774784)	(0.760908)	(0.750412)	(0.759932)	(0.693328)	(0.663803)
	-1.186211	-1.14321	-0.33227	-0.34088	-0.45629	-0.47195	-0.47596	-0.47622	-0.42764	-0.49349	-0.52024
DOC_Trust	(1.151477)	(1.101659)	(0.852505)	(0.851113)	(0.781121)	(0.772027)	(0.770021)	(0.768023)	(0.744095)	(0.749657)	(0.741436)
	0.8461796*	0.855876*	0.800821*	0.794849*	0.8473**	0.819995**	0.831744**	0.830086**	0.838354**	0.830293**	0.833261**
Participation	(0.491942)	(0.48811)	(0.458173)	(0.455168)	(0.423296)	(0.397621)	(0.382059)	(0.381645)	(0.377555)	(0.381665)	(0.383463)
	1.616577*	1.580913*	1.086233	1.0879	0.969971*	0.976733*	0.974172*	0.973823*	1.023485**	1.11913**	1.101251**
SAT_C_GP	(0.9071144)	(0.871629)	(0.676455)	(0.677227)	(0.558515)	(0.564364)	(0.562785)	(0.562188)	(0.555839)	(0.545879)	(0.535677)
	1.723845**	1.695945**	1.751533**	1.759649**	1.916303***	1.923682**	1.932668***	1.925975***	1.903824***	1.939607***	1.891536***
SAT_C_Hosp	(0.8389526)	(0.799005)	(0.742486)	(0.740237)	(0.614399)	(0.612479)	(0.607808)	(0.60232)	(0.612007)	(0.614163)	(0.576251)
	-0.7285988	-0.66508	-0.76136	-0.75242	-0.93997	-0.94502	-0.97965*	-0.97734*	-0.9978*	-1.05803*	-1.01815*
SAT_C_Doc	(1.060924)	(0.948389)	(0.860521)	(0.857113)	(0.677123)	(0.675133)	(0.592137)	(0.591815)	(0.596322)	(0.586979)	(0.566104)
	-1.567085**	-1.57843*	-1.35684*	-1.33813*	-1.28051*	-1.23127**	-1.20025**	-1.20117**	-1.21581**	-1.16225**	-1.13815**
SAT_C_Treatment	(0.7866272)	(0.782397)	(0.693826)	(0.684359)	0.655734 ()	(0.600107)	(0.52193)	(0.521766)	(0.522225)	(0.517201)	(0.503693)
	0.1581313	0.194839	0.093667	0.11126	0.083362						
SAT_C_Time	(0.581505)	(0.510654)	(0.448609)	(0.439809)	(0.435461)						
	0.1785468										
CB_AWARE	(1.21653)										
	2.871912	2.922662									
CB_Use	(2.383214)	(2.309773)									
	-0.1814284	-0.33442	-0.68649	-0.68119	-0.30375	-0.36828	-0.39107	-0.39367	-0.56363	-0.64547	-0.62991
WEB_Access	(2.107242)	(1.813491)	(1.689725)	(1.688781)	(1.248163)	(1.201655)	(1.18264)	(1.181729)	(1.087667)	(1.078176)	(1.073669)
	0.3049883	0.321252	0.436832	0.3895	0.382174	0.36762	0.374635	0.368968	0.399045	0.454745	0.470967
AgeMatch	(0.675904)	(0.667981)	(0.642998)	(0.587025)	(0.585798)	(0.579437)	(0.576317)	(0.573503)	(0.573024)	(0.562488)	(0.555307)
	1.625302*	1.646905*	1.271183	1.32497*	1.346428*	1.295927*	1.302533*	1.290756**	1.303267**	1.251888*	1.285204**
GenderMatch	(0.9550201)	(0.940185)	(0.794867)	(0.737975)	(0.726754)	(0.674346)	(0.671871)	(0.65768)	(0.658903)	(0.655342)	(0.642696)
	-2.445666*	-2.37552**	-1.66445*	-1.73668**	-1.65291**	-1.64323**	-1.64111**	-1.61578**	-1.6038**	-1.68753**	-1.67893**
WhiteBritish	(1.302153)	(1.199783)	(0.967674)	(0.88187)	(0.833364)	(0.838285)	(0.837516)	(0.78357)	(0.792896)	(0.793251)	(0.790574)
	0.1386463	0.148545	-0.03916	-0.05989	-0.08249	-0.07566	-0.09611				
WhiteNonBritish	(1.338847)	(1.334615)	(1.133546)	(1.130741)	(1.115916)	(1.144774)	(1.119425)				
	-0.4429667*	-0.44365*	-0.45861**	-0.44977**	-0.44793**	-0.44075**	-0.43956**	-0.43487**	-0.43322**	-0.41784**	-0.41836**
Income	(0.2316356)	(0.230714)	(0.209061)	(0.202333)	(0.20238)	(0.199407)	(0.198726)	(0.19095)	(0.188427)	(0.188807)	(0.188147)
	-0.4187334	-0.44168	-0.22666	-0.27136	-0.263	-0.21485	-0.21566	-0.21695	-0.17452	-0.17701	-0.19386
Education	(0.6287027)	(0.603559)	(0.52803)	(0.466123)	(0.467876)	(0.395259)	(0.394563)	(0.393897)	0.368419 ()	(0.367215)	(0.362042)

Significance: \*\*\* 1%, \*\*5%, \*10%

IntentionToUse	Model XII	Model XIII	Model XIV	Model XV	Model XVI	Model XVII	Model XVIII
Awareness	-1.35405* (0.762141)	-1.39636* (0.71649)	-1.51122** (0.697829)	-1.39906** (0.664531)	-1.23561* (0.640507)	-1.07294* (0.62631)	-1.12425* (0.575731)
HC_Waiting							
HC_HospComp							
HC_Clinical_Performance	0.742779** (0.375086)	0.752098** (0.366512)	0.764735** (0.359466)	0.849936** (0.336895)	0.898678*** (0.330463)	0.882219*** (0.326485)	0.944563*** (0.295874)
HC_CloseHome							
HC_Familiarity	-0.54233* (0.290214)	-0.51609* (0.276828)	-0.51594* (0.267087)	-0.49808** (0.25428)	-0.54864** (0.241671)	-0.60725*** (0.232756)	-0.61785*** (0.223936)
HC_FinPerform							
HC_GP_Reputation	0.828095** (0.359508)	0.814669** (0.348304)	0.797127** (0.315723)	0.747344** (0.300588)	0.739494** (0.296632)	0.611509** (0.268221)	0.595868** (0.259027)
HC_Access	0.173275 (0.246916)	0.15193 (0.238385)					
HC_PastExp							
SI_GP_Advice	-0.65977** (0.33332)	-0.62503** (0.322332)	-0.60416** (0.30826)	-0.59226** (0.297143)	-0.53056* (0.293969)	-0.56652* (0.29569)	-0.50096* (0.26816)
SI_HospStat	0.987615*** (0.337093)	0.995717*** (0.316308)	0.994115*** (0.31843)	0.92096*** (0.297078)	0.84345*** (0.284109)	0.921466*** (0.286705)	0.90438*** (0.276913)
SI_DoctorRating	0.263139 (0.308835)	0.230677 (0.295113)	0.333973 (0.255608)	0.375391 (0.251258)	0.552494** (0.228649)	0.475429** (0.213175)	0.500322** (0.214247)
SI_PastExp	-0.32261 (0.27318)	-0.36216 (0.269062)	-0.37955 (0.26113)	-0.33212 (0.252811)	-0.37862 (0.238344)		
SI_Family							
Reliable	0.958473*** (0.367147)	1.01697*** (0.358757)	0.949026*** (0.322317)	0.914138*** (0.311631)	0.816859*** (0.283659)	0.792445** (0.281111)	0.765322*** (0.267114)
DOC_Listens	1.810485** (0.908723)	1.824438** (0.852209)	1.719578** (0.791297)	1.664127** (0.768941)	1.862081** (0.739667)	1.698746** (0.704665)	1.762115*** (0.674643)
DOC_Time							
DOC_Explains	-2.87072*** (1.05123)	-2.81547*** (1.006082)	-2.67299*** (0.904423)	-2.66787*** (0.872004)	-2.74535*** (0.832484)	-2.53694*** (0.795942)	-2.53369*** (0.754888)
DOC_Friend	1.593912*** (0.617866)	1.540915*** (0.591173)	1.46116*** (0.561516)	1.384344*** (0.534861)	1.302343** (0.528824)	1.188568** (0.505959)	1.13078** (0.487777)
DOC_Trust							

Participation	0.684301** (0.344683)	0.693557** (0.331651)	0.603889** (0.289766)	0.577557** (0.281968)	0.5249* (0.276517)	0.446094* (0.26172)	0.433024* (0.256209)
SAT_C_GP	0.952641** (0.45077)	0.888207** (0.391233)	0.966883** (0.392334)	0.955362** (0.363593)	0.933933*** (0.355031)	0.875975** (0.342618)	0.85138*** (0.321651)
SAT_C_Hosp	1.98471*** (0.574437)	1.954144*** (0.556058)	1.932415*** (0.539056)	1.911218*** (0.517017)	1.863321*** (0.507577)	1.647233*** (0.479992)	1.389768*** (0.379117)
SAT_C_Doc	-1.06978* (0.575851)	-0.99994* (0.557385)	-0.9119* (0.531006)	-0.83629 (0.513876)	-0.71345 (0.470408)	-0.45209 (0.428856)	
SAT_C_Treatment	-1.07515** (0.481247)	-1.05954** (0.464941)	-1.08114** (0.45812)	-1.08222** (0.44724)	-1.05645** (0.439241)	-1.09415** (0.43443)	-1.25888*** (0.401232)
SAT_C_Time							
CB_AWARE							
CB_Use							
WEB_Access	-0.61963 (0.996695)						
AgeMatch	0.555876 (0.548903)	0.556183 (0.549439)	0.471949 (0.517743)				
GenderMatch	1.34958** (0.599521)	1.376749** (0.579511)	1.514943*** (0.554387)	1.57004*** (0.540893)	1.673178*** (0.530982)	1.634432*** (0.516775)	1.565512*** (0.493472)
WhiteBritish	-1.61082** (0.76516)	-1.5309** (0.649262)	-1.72099*** (0.619344)	-1.69463*** (0.590724)	-1.4476*** (0.551136)	-1.37653** (0.542948)	-1.312** (0.522632)
WhiteNonBritish							
Income	-0.36211** (0.16748)	-0.36542** (0.165261)	-0.36142** (0.163348)	-0.36243** (0.159068)	-0.39924*** (0.15215)	-0.41213*** (0.151761)	-0.43588*** (0.144619)
Education	-0.27091 (0.335256)	-0.26045 (0.313089)	-0.33076 (0.293814)	-0.29302 (0.287501)			



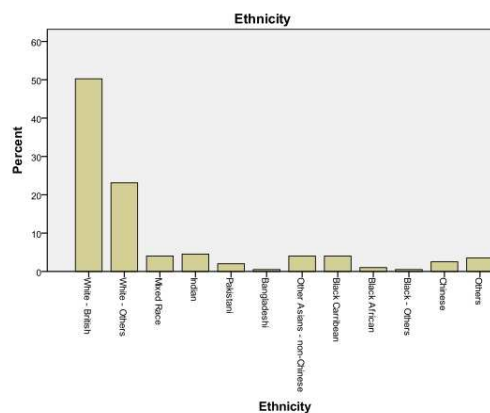
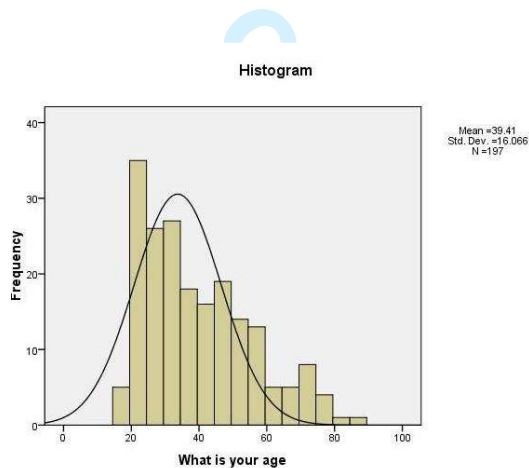
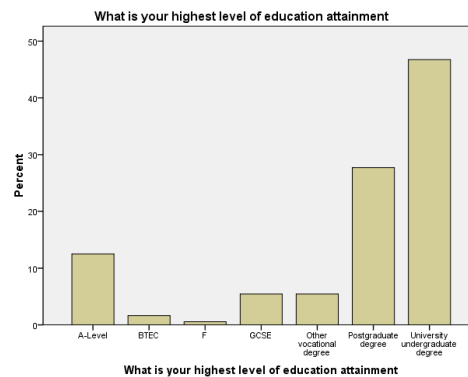
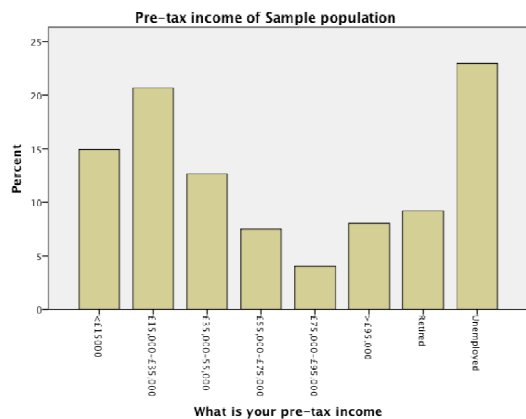
STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1-2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2- 3
<b>Introduction</b>			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	8
		(b) Describe any methods used to examine subgroups and interactions	8
		(c) Explain how missing data were addressed	8
		(d) If applicable, describe analytical methods taking account of sampling strategy	NA
		(e) Describe any sensitivity analyses	NA
<b>Results</b>			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	8-11
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	18-23
		(b) Report category boundaries when continuous variables were categorized	NA
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	11-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	11
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	12

\*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).



Figures 1 (a), (b), (c) and (d) (moving clockwise from top-left figure). Distribution of pre-tax income (a), highest level of attained education (b), ethnicity (c), and age (d) in the sample of respondents.



**Who is More Likely to Use Doctor-Rating Websites, and Why?**  
**A cross sectional study in London.**

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2012-001493.R1
Article Type:	Research
Date Submitted by the Author:	15-Aug-2012
Complete List of Authors:	Galizzi, Matteo; London School of Economics, LSE Health Miraldo, Marisa; Imperial College London, Business School Stavropoulou, Charitini; University of Surrey, Health Care Management Desai, Mihir; Imperial College London, Medicine Jayatunga, Jeevana; Imperial College London, Medicine Joshi, Mitesh; Imperial College London, Medicine Parikh, Sunny; King's College London, Medicine
<b>Primary Subject Heading</b>:	Health economics
Secondary Subject Heading:	Health policy
Keywords:	HEALTH ECONOMICS, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, World Wide Web technology < BIOTECHNOLOGY & BIOINFORMATICS

SCHOLARONE™  
 Manuscripts

Only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stravopoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

**Declaration:** All authors have completed the Unified Competing Interest form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

**Copyright statement:** The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, a worldwide licence to the Publishers and its licensees in perpetuity, in all forms, formats and media (whether known now or created in the future), to i) publish, reproduce, distribute, display and store the Contribution, ii) translate the Contribution into other languages, create adaptations, reprints, include within collections and create summaries, extracts and/or, abstracts of the Contribution, iii) create any other derivative work(s) based on the Contribution, iv) to exploit all subsidiary rights in the Contribution, v) the inclusion of electronic links from the Contribution to third party material where-ever it may be located; and, vi) licence any third party to do any or all of the above.

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stravopoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

### Article summary

#### Article focus:

- To explore the awareness of the existence of doctor-rating and its usage among the general population.
- To understand the main predictors of what makes people aware of, and willing to use doctor-ratings websites.

#### Key messages:

- The share of the general public which uses doctor-rating websites is still quite low.
- Elderly, subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The doctor-patient relationship is a significant predictor of patients' awareness of, and intention to use, doctor-rating websites.

#### Strength and Limitations:

- Our study contributes to the literature of online health information where evidence on the determinants of people's awareness of and willingness to use doctor-rating websites is limited.
- The main limitation of the study is that we use a convenience sample from one borough of London, UK and therefore results cannot be immediately generalised to the UK population.

### Abstract

**Objectives:** To explore the extent at which doctor-rating websites are known and used among the general population. To understand the main predictors of what makes people aware of, and willing to use doctor-ratings websites.

**Design:** A cross-sectional study.

**Setting:** The Borough of Hammersmith and Fulham, London, England.

**Participants:** 200 individuals from the borough.

**Main outcome measures:** The likelihood of being aware of doctor-rating websites and the intention to use doctor-rating websites.

**Results:** The use and awareness of doctor-rating websites is still quite limited. Elderly, white British subjects, as well as respondents with higher income are less likely to use doctor-rating websites. The doctor-patient relationship also plays a key role in explaining awareness of and intention to use the websites: the GP-patient gender concordance is associated with higher awareness of, and intention to use, the websites. Respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

**Conclusions:** Online rating websites can play a major role in supporting patients' informed decisions on which health care providers to seek advice from, thus potentially fostering patients' choice in health care. Subjects who seek and provide feedback on

1  
2  
3 doctor-ranking websites, though, are unlikely to be representative of the overall patients'  
4 pool. In particular, they tend to over-represent opinions from young, non white British,  
5 medium-low income patients who are not satisfied with their choice of the healthcare  
6 treatments and the level of information provided by their GP. Accounting for differences  
7 in the users' characteristics is important when interpreting results from doctor-rating sites.  
8

### 9 **Key messages**

- 10 • The share of the general public which uses doctor-rating websites is still quite  
11 low..
- 12 • Elderly, subjects with white British background, as well as subjects with higher  
13 income are less likely to use doctor-rating websites.
- 14 • The GP-patient gender concordance is associated with higher awareness of, and  
15 intention to use, the websites.
- 16 • Subjects who feel that their GP explains things clearly and is a valuable source of  
17 clear information, are less likely to use online rating websites.
- 18 • Subjects who feel that they are more satisfied with the level of choice of healthcare  
19 treatments are less likely to use online rating websites.

20  
21  
22  
23 <sup>1</sup> London School of Economics, LSE Health and Centre for the Study of Incentives in Health

24 <sup>2</sup> Imperial College Business School

25 <sup>3</sup> University of Surrey

26 <sup>4</sup> Imperial College School of Medicine

27 <sup>5</sup> King's College London

28  
29 \*Corresponding author: Marisa Miraldo. Email: [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk)  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## INTRODUCTION

This study aims, first, at providing direct evidence on the extent to which doctor ratings websites are known and used among the general public in a borough of London. It also aims to directly provide some novel insight on what appear to be the most significant predictors of the fact that people are aware of, and willing to use, doctor-ratings websites.

Although direct evidence on both these aspects is scant, especially for the UK, doctor rating websites are often regarded as key innovations within the broader health policy agenda aiming at enhancing patients' choice.

Both the NHS Plan<sup>1</sup> and the NHS Improvement Plan<sup>2</sup>, in fact, set out the changes required for the NHS to become more patient-focussed. Greater patient involvement in the running of the NHS has gone hand in hand with the policymakers' drive to improve the quality of public healthcare services. The 'bottom-up' approach to shape a more patient-centred NHS has typically focused on three main areas: i) giving users more choice and personalisation; ii) making funding respond to users' choices; and iii) engaging users through greater involvement. This was with the aim of creating a patient-led service promptly responding and supporting patients' health needs.<sup>3</sup>

Lord Darzi's 2008 report "High Quality Care For All - The Next Stage Review"<sup>4</sup> acknowledged that improvements to the NHS should focus on improving the quality of services, and that the best way of achieving this would be to ensure that services are locally responsive to the needs of the community. This would involve empowering providers and patients as decentralised decision-makers in order to foster a culture of continuous quality improvement and innovation.

Along this line, a number of initiatives have been introduced. In particular, *Choose and Book* is an IT service which allows patients needing an outpatient appointment to choose which hospital they are referred to by their GP, as well as the time and date of the appointment. *Choose and Book* was planned from 2003 as part of the National Program for IT (NPFIT), and has been progressively introduced from 2005 onwards. By 2009, 98% of GPs claimed to have used *Choose and Book* at some stage during the week, although only half of all secondary care appointments were being arranged using the system.<sup>5</sup>

A debate exists on whether *Choose and Book* has succeeded in actually increasing patient choice. A survey of 2,181 patients carried out in January 2009, for instance, found that only 46% were aware of having a choice of where to receive hospital care before attending their GP.<sup>6</sup> This seems to naturally lead to the issue that the capability of making informed choices crucially depends on the availability of relevant information.

Key sources of information are doctor-rating websites. Websites such as *NHS Choices* and *Dr Foster Intelligence* are also a relatively recent phenomenon in the UK. Compared to other sources of healthcare information – such as official hospital statistics – these websites claim to be more user-friendly and easy to understand.

In principle, doctor-rating websites can have a profound impact on public involvement and patients' choice in healthcare, as they potentially enable patients to make more informed decisions on where to seek healthcare, and thus to engage more often in active choices concerning their health and wellbeing.



1  
2  
3 In practice, however, relative little evidence is available on whether, and to what extent,  
4 doctor-rating websites are actually known and actively used in the UK. A study by the  
5 Kings Fund<sup>6</sup> explored the information sources used by patients in making decisions about  
6 where to receive care. Only 4% of the patients used the NHS Choices website, with the  
7 majority instead drawing information from their own experiences (41%), advice from GP  
8 (36%), advice from friends and family (18%), and other websites (1%). Similarly, a  
9 national survey on patients' choice by the Department of Health found that the NHS  
10 Choices website was only used by 5% of respondents.<sup>7</sup> These figures are consistent with  
11 the evidence from the US where usage of doctor rating websites is relatively more  
12 diffused and established.<sup>8,9</sup>

13  
14  
15 Moreover, very little is known about the profile of individuals who are more likely to  
16 make active use of these sites. Appleby and Alvarez<sup>10</sup> found that women in England desire  
17 patient choice more than men (69% to 56%), suggesting that women may also be more  
18 likely to use patient sources of information such as rating sites. This is in line with  
19 findings from the US where women and younger adults are more active 'online health  
20 information seekers'.<sup>11</sup>

21  
22  
23 The apparently limited uptake of doctor rating sites in the UK calls into question how  
24 effective the existing websites may be as information exchange platforms from and to  
25 representative groups of patients.

26  
27 Interventions that aim at enhancing the public engagement with health information on the  
28 Internet, and the representativeness of the users providing feedback online, require a  
29 thorough understanding of which characteristics drive the patients' awareness and use of  
30 online health information such as the doctor-rating websites.<sup>12-14</sup>

31  
32  
33 The aim of this study is to contribute to fill these gaps by providing more direct evidence  
34 to support decision-making.

## 35 36 **METHODS**

37  
38 We conducted a self-administered survey to assess the extent and the determinants of i)  
39 the awareness of the existence of doctor-ratings websites; ii) the level of actual usage of  
40 those websites; iii) the intention to use doctor-ratings websites in the future.

41  
42  
43 The field survey was considered the most appropriate administration mode to involve a  
44 sample of respondents from the general population. An online survey, in fact, by  
45 exclusively reaching the segment of active internet users, would have failed to address the  
46 main goal of the study, whether the users of doctor-rating websites are fairly  
47 representative of the general public.

### 48 49 **Questionnaire design**

50  
51  
52 Prior to the data collection a pilot study was conducted. The aim of the pilot was to gain  
53 an understanding of the practicalities associated with giving out questionnaires and  
54 collecting responses. After listening to feedback from pilot respondents, and looking at  
55 results from the pilot study, several changes were made to make the questionnaire easier to  
56 understand. The changes related to content, phrasing and ordering of questions.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

The content of the final questionnaire was based on findings from the preliminary literature review and was designed to have a number of sections (see Appendix for full questionnaire). In particular, section A focuses on the awareness of online rating websites, while section B assesses actual usage of online rating websites. Section C measures the willingness to use the online rating websites in the future, and explores which aspects of the healthcare providers and which sources of information are perceived as being important factors in making decisions about where to receive healthcare. Section D assesses the individual contribution to the online rating sites, while section E focuses on aspects of the doctor-patient relationship and attitudes and dimensions of patient choice. Finally section F controls for internet usage, while section G collects a broad range of socio-demographic characteristics.

Closed questions were used, worded in a manner easy to understand. A limited number of responses were provided, either with binary options (e.g. yes or no), or with a numerical Likert scale ranging from 1 to 5, with a further option for “*Not sure*”.

A list of variables with a brief description is discussed in the Variables section and is summarised in Table 1 in the Appendix.

### **Ethical approval, informed consent and confidentiality of responses**

We completed the checklist for research ethics approval from Imperial College London. As interviews were intended to be conducted in public places among respondents from the general population, the study involved no risk or harm of any type to respondents, no link with clinical data was expected to take place, and no incentives were going to be paid to respondents, the study fitted all the criteria in the first stage checklist with no further formal application to the Imperial College Research Ethics Committee.

At the beginning of each interview, interviewers showed credentials as research assistants at the University of London, informed respondents that their answers were anonymous and would remain strictly confidential, and that all responses and data were going to be treated statistically and used for the purposes of scientific research only. Informed consent by respondents was then given at the beginning of each interview.

### **Sample**

The survey was conducted in the field by the researchers involved in the paper. The borough of Hammersmith and Fulham was chosen for the location of the field survey because it is a transport hub in Central West London, and hosts many offices and several major business centres. The four interviewers went to different public locations within the borough (underground stations, high street and residential areas) at different times during the day (early morning, midday and in the evening) and in different days of the week (including weekends). By covering different times and locations within the borough, we aimed at being able to approach both working and non-working members of the public. During the surveys in the field, the interviewers approached every third male and third female that would pass by them. A target of 200 respondents was envisaged, which was readily achieved, since only 68 subjects who were initially approached refused to take part to the survey, with a final response rate of 74%.

## Statistical analysis

We have carried a multiple regression analysis which aims to explore the determinants of i) being either aware or not of doctor rating websites; and ii) the individual intention of using these websites in the future.

The dependent variable in the first case is modeled as a binary variable (*Awareness*) taking values 1 or 0 for the respondents who reported to be aware or unaware of the websites, respectively. The second dependent variable is instead modeled as a discrete ordered variable (*IntentionToUse*) taking values 1, 2, and 3 for subjects reporting to be 'not likely', 'quite likely', and 'likely' to use the websites in the future, respectively.

The explanatory variables ( $X_i$ ) include the variables described in Table 1, namely: individual socio-demographic characteristics; a set of variables on the characteristics of the healthcare providers that the respondents consider important for making their decisions on where to receive health care; a set of variables on the sources of information that are important in making decisions about where to receive health care; two dummy variables that capture whether the patient's gender and age are the same, or within a comparable range, respectively, than the gender and age of her GP; a set of variables that describe the respondents' feelings about their relation with their doctor; a variable indicating the level of participation of the respondents in their GPs' decisions; a set of variables on patients' satisfaction with the level of choice in their healthcare decisions; a dummy variable controlling for whether the subjects had access to internet at home or at work; a variable on awareness of the existence of doctor-rating websites; and a variable on whether the subject always asks to see the same GP (see Table 1 for variables' details). The choice of the explanatory variables was further informed by the bivariate correlation analysis reported in Table 2 in the Appendix.

We employed a binary logistic and an ordered logistic model to fit the *Awareness* and the *IntentionToUse* discrete variables, respectively, to ensure a reasonable comparability between the empirical results obtained for the two set of regressions. The two models, in fact, only differ in the number of values that the dependent variables can take, while the underlying structure of the error terms follows the same standardized logistic distribution. The logistic specification is particularly appealing because its results can be readily expressed in terms of odds ratio. We have, however, conducted a robustness check by replicating the multiple regression analysis using the alternative binary and ordered probit specifications, which assume a Gaussian error term and present results in terms of estimated coefficients instead of odds ratio. The two set of regressions provide consistent estimates and results which are qualitatively fully aligned. Results of the probit specifications are available, upon request, from the authors.

All the regression analysis has been conducted using STATA v.11.

## RESULTS

### Descriptive statistics

1  
2  
3 Descriptive statistics of all the dependent and independent variables for the resulting  
4 sample of respondents to our survey are provided in detail in Table 1, and here we briefly  
5 report their main aspects. As a result of the convenience sampling, our resulting sample  
6 consisted in 141 workers (ten of which reported to be currently unemployed), 33 students,  
7 nine officially unemployed and six retired subjects. Eleven respondents did not report  
8 their working status.  
9

10  
11 As common in field surveys of this type, the convenience sampling tended to over-  
12 represent respondents who were currently not working, or were at home, and thus had  
13 time to fill out the questionnaire: the proportion of subjects who were not currently  
14 working, as given by the sum of the respondents who reported to be unemployed, retired,  
15 or students, indeed amounts to 29% of the sample.  
16

17  
18 Related to that, it turned out that 9.5% of the respondents in our sample were currently  
19 unemployed, compared to only 5% from the Census data for the borough. The relatively  
20 higher proportion of unemployed respondents may also be a result of the convenience  
21 sampling method. Moreover, an unemployment rate higher than the one documented in  
22 the 2001 Census survey was largely expected, due to the consequences of the economic  
23 and financial crisis after 2007.  
24

25  
26 Comparing the sample with the Census data for the borough the mean age of our sample  
27 was slightly older than that for the borough (39.57 years compared to 35.2 years).<sup>15</sup> Our  
28 sample however was closer to the national mean age of 38.5 years. The range of ages  
29 seems to show a positive skew, with a greater frequency of people aged 40 years and  
30 under. This is consistent with the 2001 census data for Hammersmith and Fulham which  
31 showed the borough contained a larger proportion of young people aged 20-29 (23.8%)  
32 than the rest of England (12.66%) (ONS, 2001).<sup>15</sup> Age is an important demographic to  
33 consider when analysing our results as age has been shown to be important in internet  
34 usage.<sup>11</sup>  
35

36  
37 Also, the sample had a slightly greater proportion of females than the borough (54.44% to  
38 52% respectively), and a lower proportion of 'White British' ethnicity (48.79% compared  
39 to 58% for the borough).<sup>15</sup> This is also significantly lower than figures for England, White  
40 British accounting for 87% of the population.<sup>15</sup> The sample contained 28.99% non white  
41 respondents. This is higher than the 2001 census data for Hammersmith and Fulham  
42 which was 22% and significantly higher than the figures for England, showing non white  
43 ethnic groups accounting for 9% of the total population.<sup>15</sup> Our sample, therefore, allows  
44 controlling for high heterogeneity in ethnic background even with a limited sample size.  
45

46  
47 The majority of actively working respondents reported an income within the £15-35,000  
48 bracket. Income is an important variable to control for in the analysis, as previous  
49 literature found that patients using the Internet were more educated and had higher  
50 incomes.<sup>16</sup>  
51

52  
53 Our sample had a high percentage of people with higher level qualifications: 46.24% of  
54 the sample had a university degree and 27.96% had a postgraduate degree. This is  
55 reflective of Hammersmith and Fulham, where 45% of the population have a qualification  
56 of degree level or higher, a figure which is significantly higher than in England, where  
57 only 19.8% have a degree or higher qualification.<sup>15</sup>  
58  
59  
60

## Results on awareness

Only 29 of our respondents were aware of the doctor-rating websites they were asked about. This corresponds to less than 15% of our sample, indicating that the awareness and, consequently, usage of these online sources is still quite limited in the UK, although significantly higher than what the previous studies have shown.<sup>6</sup>

A slow uptake of online ratings has also been reported in the US, a more market-oriented health system. It is indicative that only 6% of Americans were aware of Hospital Compare, the quality reporting website maintained by the Centres for Medicare and Medicaid Services (CMS).<sup>17</sup>

In Table 3 we present the estimate results of four different specifications of the binary logistic regression for the dependent variable *Awareness* with different sets of regressors, which are presented in terms of the odds ratio, together with the standard errors, and levels of significance.

[Table 3 in here]

Among the demographic factors, age and ethnicity are the only significant variables. Older individuals are less likely to be aware of the rating websites, which does not constitute a surprise, as they are usually less familiar with the use of internet in general. Moreover, in most specifications, white British and white non-British respondents appear less likely to be aware of the websites.

Among the broader socio-demographic factors, only income is sometimes (marginally) significant, pointing to the fact that respondents with higher reported levels of income tend to be less aware of the websites, while neither education or gender turn out to be significant predictors of awareness.

Looking at the characteristics of the providers that respondents consider important in making their decisions on where to receive healthcare, in one specification the reputation of the doctor has a strong positive effect, while both clinical and financial performance rates of the providers show negative significant effects. Thus, the respondents who consider the reputation of the doctor important in deciding where to receive care are more likely to be aware of the rating websites, while this is less often the case for respondents putting a higher weight on financial or clinical performance ratings, perhaps signalling that those respondents may be more familiar with alternative sources of information.

Concerning the sources of information, in one specification respondents who consider the hospital statistics important in deciding where to receive care, turn out to be more likely of being aware of the rating websites, with an effect which is particularly significant and quite remarkable in terms of odds ratio. This may signal the possible existence of 'complementary' effects between the two sources of information, according to which individuals who give importance to hospital statistics are also more likely to actively seek for doctor rating websites.

1  
2  
3 Furthermore, although in one specification the respondents who feel that their GPs spend a  
4 sufficient time in their consultation are less likely to be aware of the internet rating  
5 websites, both the statistical significance and the estimated odds ratio do not appear robust  
6 across specifications. Although all other variables on doctor-patient relationship were not  
7 significant, whenever included among the regressors, the gender match between the GP  
8 and the patient predicts higher awareness of the website ratings, with a noticeable effect as  
9 evident by the reported value of the odds ratio.  
10

11 From those that were aware of the existence of doctor-rating websites only 6 have  
12 reported to have used these websites. In light of this low usage rate, and of the consequent  
13 limitations of conducting statistical estimations with very little variation in the dependent  
14 outcomes, we have thus focused the rest of the analysis on the determinants of the  
15 intention to use, rather than actual usage of, doctor rating websites.  
16  
17

### 18 19 20 21 **Results on the likelihood to use online rating websites**

22 In Table 4 we present the estimate results of six different specifications of the ordered  
23 logistic regression for the dependent variable *IntentionToUse* with different sets of  
24 regressors, which are presented in terms of the odds ratio, together with the standard  
25 errors, and levels of significance.  
26  
27

28 **[Table 4 in here]**  
29

30 Concerning socio-demographic variables, it turns out that white British, as well as  
31 respondents who reported income in higher brackets, said they were less likely to use  
32 doctor-rating websites. Moreover, we do not find any effect of education, age and gender  
33 of the respondents on the likelihood of their intention to use (the results of the  
34 specifications including the age and gender variables are not reported in the table for the  
35 sake of space but are available from the authors upon request).  
36  
37

38 Looking at the characteristics of the healthcare providers that respondents perceived as  
39 important while making decisions where to receive healthcare, our data suggest that those  
40 who consider clinical performance and doctor reputation (in most specifications) as  
41 important factors, are more likely to use doctor-rating websites. These results are  
42 consistent with the nature of the information provided in these websites. Also, and quite  
43 intuitively, subjects who consider the familiarity with their doctor an important factor to  
44 decide where to seek healthcare, tend to be less likely to intend to use websites.  
45  
46

47 Concerning the role of the different sources of information on the decisions of where to  
48 seek healthcare, respondents who see published hospital statistics as important sources of  
49 information are more likely to use the rating websites. On the other hand, and  
50 interestingly, those for whom GP advice is an important source of information for decision  
51 making are less likely to use doctor-rating websites.  
52  
53

54 Also the nature of the doctor-patient relationship seems to play a key role in explaining  
55 whether respondents intend to use online rating websites. First, patients with GPs of the  
56 same gender tend to be more likely to use the websites. Second, respondents for whom the  
57 doctor is able to listen to them, and who perceive the nature of the relationship with their  
58 GP as friendly, also tend to be more likely to use the websites. Third, respondents who  
59  
60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

feel that their doctor explains things clearly are less likely to use online rating websites. Fourth, it also transpires that the more autonomy patients have in their healthcare decisions, the more likely they are to be willing to use the rating websites.

Finally, concerning, the interaction between levels of satisfaction for the healthcare services within the NHS, and the intention to use doctor-rating websites, it is interesting to note that those that have reported to be more satisfied with the level of choice of GP, and with the amount of choice of the hospital to receive outpatient appointments, are more likely to use these websites. On the other hand, the respondents that are more satisfied with the level of choice of treatments are less likely to use the websites.

## DISCUSSION

In this section we briefly discuss our main findings on i) the determinants of the awareness of doctor rating websites; ii) the actual usage of the websites; and iii) the determinants of the intention to use them in the future.

### Awareness

As for the determinants of being aware of the doctor rating websites, we see the significant and positive effect by the gender match between the GP and the patient as a particularly interesting finding. The doctor-patient gender concordance, in fact, has often been reported in the literature as a factor associated with higher patient satisfaction with the consultation as well as better outcomes.<sup>18</sup> If we interpret the gender match variable as an indication of satisfaction with the consultation, our finding indicates that being aware of the doctor-rating websites is not necessarily the result of a poor consultation. Instead, the Internet and the doctor are likely to be seen as complementary, rather than alternative, information channels.

### Actual usage

Concerning the low reported rate of active usage of doctor rating websites, the finding is not too surprising given that the survey was done among the general population: the reason why many more respondents were aware of the online ratings than did actually use it may simply be because those subjects did not actually need to see a doctor. Generally speaking, the finding is consistent with previously reported levels of usage in the UK. In particular, a study by the Kings Fund<sup>6</sup> that explored the information sources used by patients in making decisions about where to receive care, found that only 4% of the patients used the *NHS Choices* website, with the majority instead drawing information from their own experiences (41%), advice from GP (36%), advice from friends and family (18%), and other websites (1%). Similarly, a national survey on patients' choice by the Department of Health found that the *NHS Choices* website was only used by 5% of respondents.<sup>7</sup>

The proportion of active users in our survey is also consistent with evidence from the US on the limited usage of doctor rating websites. Gao et al.<sup>9</sup> analysed 386,000 national ratings from 2005-2010 in the US and showed that only 1 out of 6 physicians among those included in the study had received some rating. Lagu, Hannon, Rothberg et al.<sup>8</sup> also reported a low average number of ratings per physician.

## Intention to use

The result that shows that white British and respondents who reported income in higher brackets said that they were less likely to use doctor-rating websites, is partly in contrast to what found by the previous literature<sup>16,19,20</sup> and can signal that white British subjects and respondents with higher self-reported income may feel less in need of checking online doctor ratings, perhaps because they may also have private, or employer-paid, health insurance schemes, or because they are in the position of directly accessing alternative sources of information through their networks of acquaintances. Another possible explanation may be that white British individuals may trust less information that exists online and they have more concerns about confidentiality issues as shown in a study among different socio-economic groups in the US by Brodie et al.<sup>12</sup> As the estimated effect of these variables appear to be robust across all empirical specifications, these findings seem to suggest that online doctor-rating websites are likely to be particularly attractive to subjects with non-white British ethnicity and less favoured economic background.

On the other hand, the lack of statistical significance in the ordered logit estimates, seems to suggest that while age can be a significant factor in explaining the awareness of Internet for health information, it is not significantly explaining the intention to use doctor-rating websites once subjects are made aware of their existence. The analogous lack of significance for the respondents' gender, on the other hand, does not support the view that women in the UK may be more likely to use patient sources of information and rating websites, although they have been found to desire patient choice more than men (69% to 56%).<sup>10</sup> Both results differ from the findings from the US, where women and younger adults are more active 'online health information seekers'.<sup>11</sup>

From the perspective of the doctor-patient relationship, the finding that patients with GPs of the same gender tend to be more likely to use the websites is of particular interest, and it is consistent with the analogous effect found for the likelihood of being aware of those websites. Considered together these findings point to the possible explanation that the doctor and the Internet may sometimes be seen by patients as "complementary", rather than alternative, information channels.<sup>19</sup> This interpretation is further confirmed by the finding that respondents for whom the doctor is able to listen to them, and who perceive the nature of the relationship with their GP as friendly, also tend to be more likely to use the websites.

On the other hand, there may be other dimensions in the patient-doctor relationship which seem to rather point to a "substitute" relationship with information on the Internet. For instance, the fact that respondents who feel that their doctor explains things clearly are less likely to use online rating websites, suggests that when they are generally more satisfied with the feedback provided by their doctor they are less concerned about finding about alternative doctors and compare them with their current GP.

This result on a "substitute relationship" is consistent with previous evidence by Diaz and colleagues<sup>16</sup> that found that 11% of their respondents said they would rather use the Internet 'instead of seeing or speaking with their doctors', and that 59% of respondents 'did not discuss information with their doctors'. It also seems in line with the study by McMullan<sup>19</sup> that indicates that patients who become dissatisfied with the information



provided to them by the health professionals are more likely to seek confirmation of the information given and additional information on the Internet.

As for the other aspects of the patient-doctor relationship, the finding that the more autonomous patients are in their healthcare decisions, the more willing they are to use the rating websites is also consistent with previous evidence: a study by McMullan<sup>19</sup>, for instance, reports that patients would seek health information before a consultation ‘to manage their own healthcare independently’. These may be the type of people who are ‘more likely to be health-oriented’ or ‘health conscious’, and therefore be more proactive in consultations.<sup>21</sup>

Moreover, the positive association between willingness to use doctor rating websites and levels of satisfaction with the level of choice of GP, and of outpatient appointments in the hospital, can be considered as reinforcing the above discussed interpretation that some dimensions of the doctor-patient relationship may be “complementary” with online information. For instance, patients who are more satisfied with their GP because they feel the latter is more friendly and empathic may also be more likely to engage more actively with health and healthcare information more generally. These results, together with the finding that the respondents who are more satisfied with the level of choice of treatments are less likely to use the websites, suggest that the choice of doctors and providers may be seen as only instrumental for the choice of treatment, and therefore respondents that are happy with treatment choice levels are less likely to shop around for different doctors’ opinions.

### General discussion

Overall, our evidence on the determinants of both awareness and intention to use is broadly consistent with recent findings from the literature. Indeed, a study by Stevenson and colleagues<sup>22</sup> shows that although patients use the Internet increasingly more, they show no intention of doing so with the aim of disrupting the existing balance of roles during the doctor-patient consultation. They all mentioned the Internet as an additional resource of health and healthcare information. Other evidence suggests that patients with hypertension who search for more information on the Internet, in addition to that they receive from their doctor, may be more engaged in their treatment, and therefore more willing to adhere to medication prescribed by them.<sup>23</sup>

Our findings that online information can be used not only as “substitute” but also, and perhaps mainly, as “complementary” to several dimensions of the doctor-patient relationship do not seem to entail any particular evidence suggesting that online ratings may put in danger the doctor-patient relationship, an important aspect which has been raised in the literature.<sup>24,25</sup>

The “complementarity” findings, in particular, seem consistent with the evidence from the US which shows that the vast majority of the reviews by patients are generally rather positive.<sup>8,9,26</sup> Taken together, this evidence can be seen as providing little support to the related concern that the likeliest to use online ratings and enter actual comments may be the most disgruntled patients.<sup>27</sup>

On a related topic, concerns have been expressed about the ability of online ratings to truly reflect the quality of care. A recent UK study, however, demonstrated a strong relationship between the ratings reported online and more objective measures of clinical

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

quality such as mortality and infection rates,<sup>28</sup> while another study showed that online ratings were associated with ratings derived from a traditional paper-based survey.<sup>29</sup> Online ratings, thus, do not seem to provide systematically biased or misleading information regarding the health care that patients receive, at least not more than a traditional survey would do. Consistently with this evidence, our results seem to support the idea that patients may see online ratings as a supplementary information base to be used in support of direct interaction with their doctor, which remains the most significant and reliable information channel.<sup>30</sup>

More generally, the evidence provided by our study confirms that the actual usage of doctor-rating websites in the UK remains particularly low. In our sample only 29 respondents out of 200 were aware of the existence of the patient rating websites. Among these, however, only 6 subjects reported they were actually using those websites.

While these figures are substantially in line with previous evidence brought forward from the literature,<sup>6,7</sup> considered together these results may pose serious concerns on the reasons and consequences of the lack of patient awareness and usage.

Previous studies in the US have reported a number of reasons behind this slow uptake, including i) the preference for more traditional information channels, such as recommendations by family and friends; ii) the lack of time; and iii) in many cases the fact that people do not recognise that the quality of care may vary.<sup>25</sup>

Our study confirms that not only awareness of rating websites is still limited among the general public in the UK, but awareness per se does not seem a sufficient condition to guarantee active usage. This poses a double challenge from a clinician and health policy perspective.

In fact, on the one hand, the documented correlation between online ratings and other measures of healthcare quality, including survey-based ratings and clinical quality indicators,<sup>28,29</sup> necessarily requires that patients have already gone through two preliminary hurdles, namely i) being aware of, and ii) being active users of the doctor rating websites. If the ultimate goal is indeed the continuous enhancement of healthcare quality, the effective removal of this double hurdle is likely to become the next priority to guarantee the full spread of online rating website.

On the other hand, while appropriate online and offline informational campaigns are likely to overcome the first hurdle, thus effectively raising patients' awareness of online ratings as a potential source of information on provider quality, informational campaigns alone can fail to effectively trigger changes in behaviour. Alike in several other health contexts, in fact, 'nudging' behaviour may be difficult as a mere consequence of accessing more information.

If this is the case, other avenues should be explored to increase the active usage of rating websites by patients who are already aware of them. For instance, the evidence brought forward by the present study confirms the importance of the doctor-patient relationship as a factor determining individuals' awareness of and willingness to use online ratings<sup>25,31-34</sup> and suggests that tailored behavioural interventions based on the doctor-patient relationship have the potential to help patients to overcome this last hurdle and actively engage with online ratings.

### Limitations of the study

While dictated by practical issues, the convenience sampling is a limitation of the study, and tends to over-represent respondents who are currently not employed, such as unemployed, retired and students. Also the fact that the study was conducted in only one borough of London limits the possibility to immediately generalise the findings to the broader UK population.

In an attempt to make such limitations of smaller concern to enhance the external validity and generalisability of the analysis, we have i) chosen a borough which comprises a mix of both affluent and deprived neighbourhoods from heterogeneous ethnic backgrounds; ii) conducted surveys in the field at different public locations and at different times of the day and of the week to approach both working and non-working members of the public; and iii) controlled for a wide range of socio-demographic measures in the statistical analysis.

### CONCLUSIONS

This study brings forward direct evidence suggesting that the awareness and actual usage of doctor-rating websites in the UK remains particularly low. In a sample of the general public from a borough of London only 29 respondents out of 200 were aware of the existence of the patient rating websites, and only 6 reported to be actually using those websites.

By collecting a broad range of information on the socio-demographic characteristics of the respondents, their views and perceptions of the most important aspects of healthcare quality, patient choice, and doctor-patient relationship, the study also explicitly explores the determinants of respondents' awareness of the doctor ratings websites, and of their intention to use the sites in the future.

Among other results, the statistical analysis provides evidence that the GP-patient gender concordance is associated with higher awareness of, and intention to use, the websites, while respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

The existence of both "substitute" and "complementary" effects between the doctor-patient and the Internet information channels is not at all conflicting. In fact, they both indicate that the level of concordance achieved during the consultation is likely to define whether or not individuals will seek for further information channels, such as the Internet.

When the outcome of a consultation does not satisfy the patient, the use of Internet fills the gap of information needs. The intention to use online doctor-rating websites in this case also indicates that these patients are likely to look at these websites with the aim of seeking for another clinician. Individuals who are satisfied with their GPs may also search these websites, but more as an additional information channel as they seem keener to engage more actively with health and healthcare information in general.

1  
2  
3  
4 The findings of our study thus contribute also to the wider debate on the inter-  
5 relationships between Internet usage and the doctor-patient relationship.<sup>8,25,26, 31-34</sup> The  
6 argument, sometimes addressed by the previous literature, that information on the Internet  
7 can threaten the trust relationship and the balance of roles between doctors and patients,  
8 seems a concern which is not supported by our evidence. If any, a potential challenge to  
9 the doctor-patient relation can only affect the patients who already feel dissatisfied with  
10 the ability of their doctor to listen to them and provide them enough information regarding  
11 their condition, or with the level of their choice for healthcare treatments.  
12

13  
14 The above, however, can hardly be seen as a serious threat by those who advocate a  
15 greater choice by patients. On the contrary, if the latter is indeed a priority in the health  
16 policy agenda, online information on healthcare providers should be seen as a challenging  
17 opportunity to enhance patients' choice in healthcare, and public engagement with health  
18 information, especially for the less favoured segments of the population. Indeed, our  
19 findings suggest that subjects of non-white background and with lower income are more  
20 willing to use online ratings.  
21

22  
23 Finally, our study highlights that subjects who use doctor rating websites are unlikely to  
24 be representative of the overall patients' pool. In particular, they tend to over-represent  
25 opinions from young, non-white British, medium-low income patients who are not  
26 satisfied with their choice of healthcare treatments. Accounting for differences in the  
27 users' characteristics is important when interpreting results from doctor-rating sites and  
28 when informing interventions that aim at enhancing the public engagement with health  
29 information on the Internet, and the representativeness of the users who seek and provide  
30 feedback online.  
31

32  
33  
34  
35 **Data sharing:** technical appendix, statistical code and dataset available from the  
36 corresponding author at [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk). Consent for data sharing was not  
37 obtained but the presented data are anonymised and risk of identification is low.  
38

39  
40 All authors had full access to all the data in the study and take responsibility for the  
41 integrity of the data and the accuracy of the data analysis.  
42

43  
44 **Funding:** this piece of work has not received any specific funding.  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## REFERENCES

1. Department of Health. The NHS Plan: a plan for investment, a plan for reform. Crown 2000. Cm 4818-I.
2. Department of Health. The NHS Improvement Plan: Putting people at the heart of public services. London: The Stationery Office 2004. Cm 6268.
3. Department of Health. Creating a patient-led NHS: Delivering the NHS Improvement Plan. London: The Stationery Office 2005.
4. Department of Health. High Quality Care For All: NHS Next Stage Review final report. London: The Stationery Office 2008. Cm 7432.
5. House of Commons Public Accounts Committee. The National Programme for IT in the NHS: Progress since 2006. London: The Stationery Office 2009.
6. Dixon A, Robertson R, Appleby J, et al. Patient Choice. London: The Kings Fund 2010 [http://www.kingsfund.org.uk/publications/patient\\_choice.html](http://www.kingsfund.org.uk/publications/patient_choice.html)
7. Department of Health. Report of the National Patient Choice Survey, England. Crown 2008.
8. Lagu T, Hannon NS, Rothberg MB, et al. Patients' Evaluations of Health Care Providers in the Era of Social Networking: An Analysis of Physician-Rating Websites. *J Gen Intern Med* 2010;**25**(9):942-6.
9. Gao GG, McCullough JS, Agarwal R et al. A Changing Landscape of Physician Quality Reporting: Analysis of Patients' Online Ratings of Their Physicians Over a 5-Year Period. *J Med Internet Res* 2012; **14**(1):e.38.
10. Appleby J, Alvarez A. Public Responses to NHS Reform. In British Social Attitudes Survey 22nd Report, London: Sage Publications 2005.
11. Ybarra M, Suman M. Help seeking behavior and the Internet: A national survey. *Int J Med Inform* 2006;**75**(1): 29-41.
12. Brodie M, Flournoy RE, Altman DE, et al. Health information, the Internet, and the digital divide. *Health Affairs* 2000; **19**(6): 255-265.
13. Gustafson DH, Hawkins RP, Boberg EW, et al. CHES: 10 years of research and development in consumer health informatics for broad populations, including the underserved. *International Journal of Medical Informatics* 2002; **65**: 169-177.
14. Car J, Lang B, Colledge A, Ung C, Majeed A. Interventions for enhancing consumers' online health literacy. *Cochrane Database of Systematic Reviews* 2011; **6**: Art. No.: CD007092. DOI: 10.1002/14651858.CD007092.pub2.
15. Office for National statistics. 2001 Census: Key Statistics. 2001. Available from: <http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.doa=3&b=276755&c=hammersmith&d=13&e=15&g=334516&i=1001x1003x1004&m=0&r=1&s=1273150763921&enc=1&dsFamilyId=47>
16. Diaz JA, Griffith RA, Ng JJ, et al. Patients' use of the Internet for medical information. *J Gen Intern Med* 2002;**17**(3): 180-185.
17. Kaiser Family Foundation, 2008 Update on consumers' views of patient safety and quality information. Kaiser Family Foundation. <http://www.kff.org/kaiserpolls/posr101508pkg.cfm>.
18. Bertakis KD. The influence of gender on the doctor-patient interaction. *Patient Educ Couns* 2009;**73**(3): 356-60.
19. McMullan M. Patients using the Internet to obtain health information: how this affects the patient-health professional relationship. *Patient Educ Couns* 2006;**63**(1-2): 24.

20. Cotten SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. *Soc Sc Med* 2004;**59**(9): 1795-1806.
21. Dutta-Bergman MJ. Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. *J Med Internet Res* 2004;**6**(2): e15.
22. Stevenson FA, Kerr C, Murray E, et al. Information from the Internet and the doctor-patient relationship: the patient perspective – a qualitative study. *BMC Fam Pract* 2007;**8**: 47.
23. Stavropoulou C. Perceived information needs and non-adherence: evidence from Greek patients with hypertension. *Health Expect Published Online First*: 17 April 2011. doi: 10.1111/j.1369-7625.2011.00679.x
24. McCartney M. Will doctor rating sites improve the quality of care? *BMJ* 2009: **338b** 1033.
25. Lagu T and Lindenauer PK. Putting the public back in public reporting of health care quality. *JAMA* 2010;**304**(15):1711-1712.
26. López A, Detz A, Ratanawongsa N, et al. What Patients Say About their Doctors Online: A Qualitative Content Analysis. *J Gen Intern Med* 2012;**27**(6):685-92.
27. Wachter B. The patient will rate you now. 2012 Available at: <http://community.the-hospitalist.org/2012/03/19/the-patient-will-rate-you-now>
28. Greaves F, Pape U, King D, et al. Associations between internet-based patient ratings and conventional surveys of patient experience in the English NHS: an observational study. *BMJ Qual Saf* 2012; **21**: 600-605.
29. Greaves F, Pape UJ, King D, et al. Associations between Web-based patient ratings and objective measures of hospital quality. *Arch Intern Med* 2012;**172**: 435-436.
30. Coulter A, Ellins J, Swain D, et al. Assessing the quality of information to support people in making decisions about their health and healthcare. Picker Institute Europe. 2006 Nov. Retrieved from [http://www.pickereurope.org/assets/content/pdf/Project\\_Reports/Health-information-quality-web-version-FINAL.pdf](http://www.pickereurope.org/assets/content/pdf/Project_Reports/Health-information-quality-web-version-FINAL.pdf)
31. Nwosu CR, Cox BM. The impact of the Internet on the doctor-patient relationship. *Health Informatics Journal* 2000;**6**(3): 156-161.
32. Broom A. Virtually He@lthy: The Impact of Internet Use on Disease Experience and the Doctor-Patient Relationship. *Quality Health Research* 2005;**15**(3): 325-345.
33. Gorrindo T. Web searching for information about physicians. *JAMA* 2008; **300**(2), 213.
34. Malone M, Mathes L, Dooley J et al. Health information seeking and its effect on the doctor–patient digital divide. *Journal of Telemedicine and Telecare* 2005: **11** (Suppl.1): S1:25–28.

**Appendix**  
**Table 1 Variable description and descriptive statistics**

Variable	Obs	Mean	Std. Dev
<b>Awareness (<i>Awareness</i>) (0=no, 1=yes)</b>	200	0.142	0.350
<b>Intention to use (<i>IntentionToUse</i>)</b>	199	2.136	0.743
<b>Not likely</b>	43		
<b>Quite likely</b>	86		
<b>Likely</b>	70		
<b>Important factors in making decisions (1=not important at all, 5=very important)</b>			
<b>Waiting lists (<i>HC_Waiting</i>)</b>	198	3.818	1.165
<b>Rates of hospital-acquired complications (<i>HC_HospComp</i>)</b>	188	3.761	1.193
<b>Clinical performance (<i>HC_Clinical_Performance</i>)</b>	189	4.037	1.136
<b>Closeness to home (<i>HC_CloseHome</i>)</b>	200	3.683	1.265
<b>Familiarity with the doctor (<i>HC_Familiarity</i>)</b>	194	3.237	1.306
<b>Financial performance of the hospital (<i>HC_FinPerform</i>)</b>	191	2.387	1.164
<b>Reputation of the doctor (<i>HC_GP_Reputation</i>)</b>	199	3.980	1.137
<b>Accessibility and parking facilities (<i>HC_Access</i>)</b>	192	2.656	1.321
<b>Past experience with the provider (<i>HC_PastExp</i>)</b>	193	3.544	1.311
<b>Important sources of information in making decisions (1=not important at all, 5=very important)</b>			
<b>GP advice (<i>SI_GP_Advice</i>)</b>	198	4.071	1.030
<b>Published hospital statistics (<i>SI_HospStat</i>)</b>	183	2.934	1.193
<b>Online doctor rating websites (<i>SI_DoctorRating</i>)</b>	178	2.315	1.204
<b>Personal experiences in the past (<i>SI_PastExp</i>)</b>	192	4.234	1.004
<b>Feedback from family/friends (<i>SI_Family</i>)</b>	194	4.149	0.924
<b>I feel the doctor...</b>			
<b>...listens (0=no, 1=yes) (<i>DOC_Listens</i>)</b>	200	0.575	0.496
<b>...has time (0=no, 1=yes) (<i>DOC_Time</i>)</b>	200	0.410	0.493
<b>...explains (0=no, 1=yes) (<i>DOC_Explains</i>)</b>	200	0.555	0.498
<b>...is friendly (0=no, 1=yes) (<i>DOC_Friend</i>)</b>	200	0.445	0.498
<b>... Is someone I can trust (0=no, 1=yes) (<i>DOC_Trust</i>)</b>	200	0.550	0.499
<b>I feel that online rating is a reliable measure (1=very unreliable, 5=very reliable) (<i>Reliable</i>)</b>	141	2.759	1.055
<b>How actively do you participate with your GP in making decisions (<i>Participation</i>)</b>	193		
<b>My doctor always makes decisions for me</b>	2		
<b>I like to know the options available but still let my doctor decide for me</b>	13		
<b>My doctor and I make the decisions together</b>	25		
<b>I make decisions for myself, after considering the advice of my GP</b>	65		
<b>I always make my own decisions, independently of the advice of my GP</b>	75		
<b>I make decisions with my parents/spouse/relatives</b>	13		
<b>Satisfied with the current level of choice of... (1 = strongly dissatisfied, 5 = strongly satisfied)</b>			
<b>...GP (<i>SAT_C_GP</i>)</b>	173	3.451	1.138
<b>...hospital (<i>SAT_C_Hosp</i>)</b>	152	3.493	1.055
<b>...doctor (<i>SAT_C_Doc</i>)</b>	139	3.252	1.022
<b>...treatment (<i>SAT_C_Treatment</i>)</b>	148	3.554	0.928
<b>...time spent (<i>SAT_C_Time</i>)</b>	168	3.179	1.123

<b>Ethnicity</b>				
<b>White British (0=no, 1=yes) (WhiteBritish)</b>	200	0.488	0.501	
<b>White Other (0=no, 1=yes) (WhiteNonBritish)</b>	200	0.222	0.417	
<b>Highest level of educational attainment* (Education)</b>				
<b>1 if GCSE</b>	12			
<b>2 if A-Level/BTEC/Vocational</b>	36			
<b>3 if University undergraduate degree</b>	86			
<b>4 if Postgraduate Degree</b>	52			
<b>Age (years) (Age)</b>	199	39.572	16.083	
<b>Gender (Gender)</b>				
<b>Female (=1)</b>	112			
<b>Male (=0)</b>	88			
<b>Income (Income)</b>				
<b>0</b>	40			
<b>&lt;£15000 but &gt;0</b>	27			
<b>£15,000-£35,000</b>	36			
<b>£35,000-55,000</b>	22			
<b>£55,000-£75,000</b>	14			
<b>£75,000-£95,000</b>	7			
<b>&gt;£95,000</b>	14			
<b>Doctor-patient concordance</b>				
<b>Age Match (=1 if doctor and patient belong to the same age bracket; =0 otherwise) (AgeMatch)</b>	200	0.333	0.473	
<b>Gender Match (=1 if patient and doctor are of same gender; =0 otherwise) (GenderMatch)</b>	200	0.444	0.498	



Table 2: Bivariate Correlations

	IntentionToUse	Awareness		IntentionToUse	Awareness
<b>IntentionToUse</b>	1		<b>DOC_Friend</b>	0.0127 (0.8599)	-0.0984 (0.1667)
<b>Awareness</b>	0.0846 (0.2359)	1	<b>DOC_Trust</b>	-0.0288 (0.6899)	-0.0388 (0.5863)
<b>HC_Waiting</b>	0.1617** (0.025)	0.016 (0.8236)	<b>Participation</b>	0.0412 (0.5678)	0.0189 (0.7911)
<b>HC_HospComp</b>	0.1474** (0.0465)	-0.0033 (0.9643)	<b>SAT_C_GP</b>	-0.0419 (0.591)	0.122 (0.1108)
<b>HC_Clinical_Performance</b>	0.2146*** (0.0034)	-0.0784 (0.2849)	<b>SAT_C_Hosp</b>	-0.003 (0.9715)	0.1024 (0.2111)
<b>HC_CloseHome</b>	-0.0623 (0.3848)	-0.0998 (0.1587)	<b>SAT_C_Doc</b>	-0.0348 (0.6909)	0.137 (0.1077)
<b>HC_Familiarity</b>	-0.0078 (0.9153)	-0.0752 (0.2986)	<b>SAT_C_Treatment</b>	-0.0157 (0.8526)	0.0932 (0.2598)
<b>HC_FinPerform</b>	0.1253** (0.0884)	0.1435** (0.0482)	<b>SAT_C_Time</b>	-0.0239 (0.7632)	0.0541 (0.4878)
<b>HC_GP_Reputation</b>	0.2020*** (0.0047)	-0.016 (0.8234)	<b>CB_AWARE</b>	-0.0381 (0.5972)	0.2997*** (0)
<b>HC_Access</b>	0.0451 (0.5399)	0.1196* (0.0992)	<b>CB_Use</b>	0.0996 (0.1651)	0.054 (0.4477)
<b>HC_PastExp</b>	0.0978 (0.182)	-0.0244 (0.7369)	<b>WEB_Access</b>	0.2054*** (0.0041)	0.1197* (0.0923)
<b>SI_GP_Advice</b>	0.1054 (0.1457)	0.0163 (0.8202)	<b>AgeMatch</b>	0.1373* (0.0532)	0.0695 (0.3234)
<b>SI_HospStat</b>	0.2937*** (0.0001)	0.1159 (0.1192)	<b>GenderMatch</b>	0.2077*** (0.0032)	0.1472** (0.0357)
<b>SI_DoctorRating</b>	0.3759*** (0)	0.1240* (0.099)	<b>WhiteBritish</b>	-0.0429 (0.5477)	-0.0662 (0.3468)
<b>SI_PastExp</b>	0.0563 (0.4455)	-0.0803 (0.2696)	<b>WhiteNonBritish</b>	-0.0017 (0.9809)	-0.0853 (0.2252)
<b>SI_Family</b>	0.1215* (0.0958)	-0.0511 (0.4804)	<b>Income</b>	0.012 (0.8818)	-0.1219 (0.1246)
<b>Reliable</b>	0.3429*** (0)	-0.0311 (0.7153)	<b>Education</b>	-0.0103 (0.8913)	0.0023 (0.9757)
<b>DOC_Listens</b>	0.0629 (0.3824)	-0.0888 (0.2122)	<b>Gender</b>	0.0315 (0.6614)	-0.0087 (0.9029)
<b>DOC_Time</b>	0.1565** (0.0289)	-0.0117 (0.87)	<b>Age</b>	-0.1081 (0.1344)	-0.1918*** (0.0068)
<b>DOC_Explains</b>	0.0968 (0.1784)	0.0152 (0.8314)			

P-Values in parentheses. \* p<.10, \*\* p<.05, \*\*\* p<.01

Table 3 Odds Ratios for the Binary Logit explaining the awareness of doctor rating websites.

	Model 1	Model 2	Model 3	Model 4
<b>Awareness</b>				
<b>Age</b>	0.953*	0.931**		
	(0.0239)	(0.0307)		
<b>Gender</b>	1.347	1.819		
	(0.648)	(1.092)		
<b>WhiteBritish</b>	0.595	0.841	0.401	0.0150**
	(0.309)	(0.524)	(0.276)	(0.0292)
<b>WhiteNonBritish</b>	0.273*	0.398	0.228*	0.00399**
	(0.198)	(0.324)	(0.200)	(0.00957)
<b>Education</b>	1.105	1.396	1.279	1.682
	(0.341)	(0.534)	(0.438)	(1.399)
<b>Income</b>	0.952	0.943	0.708*	0.228*
	(0.157)	(0.169)	(0.132)	(0.180)
<b>HC_HospComp</b>		1.173	1.353	2.237
		(0.366)	(0.442)	(1.825)
<b>HC_Clinical_Performance</b>		0.691	0.527	0.0342*
		(0.245)	(0.207)	(0.0609)
<b>HC_Familiarity</b>		0.710	0.756	2.564
		(0.170)	(0.202)	(2.096)
<b>HC_GP_Reputation</b>		1.409	1.611	13.57*
		(0.509)	(0.599)	(19.95)
<b>HC_FinPerform</b>		0.921	0.963	0.0783**
		(0.264)	(0.297)	(0.0919)
<b>HC_Access</b>		1.112	1.088	0.917
		(0.236)	(0.242)	(0.444)
<b>SI_GP_Advice</b>		1.173	0.922	1.115
		(0.350)	(0.290)	(0.718)
<b>SI_HospStat</b>		1.291	1.390	49.75**
		(0.410)	(0.477)	(87.28)
<b>SI_Family</b>		0.935	0.614	0.146
		(0.361)	(0.273)	(0.186)
<b>SI_PastExp</b>		0.762	1.202	0.284
		(0.275)	(0.499)	(0.343)
<b>SI_DoctorRating</b>		0.938	0.933	1.859
		(0.261)	(0.271)	(1.119)
<b>DOC_Listens</b>			0.416	1.182
			(0.324)	(2.244)
<b>DOC_Time</b>			1.289	0.00185**
			(0.950)	(0.00580)
<b>DOC_Explains</b>			2.533	0.885
			(1.799)	(1.658)
<b>DOC_Friend</b>			0.752	15.62
			(0.535)	(30.63)
<b>DOC_Trust</b>			0.930	3.173
			(0.583)	(4.555)
<b>Participation</b>			1.080	3.346
			(0.298)	(2.835)
<b>AgeMatch</b>			2.247	269.4*
			(1.429)	(791.0)
<b>GenderMatch</b>			3.153*	32.77*
			(1.867)	(61.36)
<b>SAT_C_GP</b>				3.020
				(2.948)
<b>SAT_C_Hosp</b>				0.802
				(1.134)

SAT_C_Doc	2.794
	(3.411)
SAT_C_Treatment	1.818
	(2.311)
SAT_C_Time	0.735
	(0.550)
Same GP	0.641
	(0.766)

Exponentiated coefficients; Standard errors in parentheses

\* p<.10, \*\* p<.05, \*\*\* p<.01

Table 4 Odds Ratios for the Ordered Logit explaining the likelihood to use doctor rating websites

	m1	m2	m3	m4	m5	m6
AgeMatch	1.974	2.561	2.000	2.782	1.051	0.946
	(2.377)	(2.953)	(1.965)	(2.613)	(0.818)	(0.729)
GenderMatch	18.42*	12.03*	10.45**	10.39**	16.67***	14.83***
	(30.24)	(17.75)	(12.33)	(10.54)	(15.48)	(13.17)
Awareness	0.0531	0.0505	0.0964	0.0758**	0.159*	0.147*
	(0.108)	(0.0971)	(0.149)	(0.0985)	(0.176)	(0.152)
HC_Clinical_Performance	9.289*	7.659*	5.560**	3.401*	4.395**	4.985***
	(11.84)	(8.241)	(4.759)	(2.253)	(2.653)	(2.734)
HC_Familiarity	0.359	0.468	0.371*	0.414*	0.355**	0.351***
	(0.287)	(0.282)	(0.220)	(0.206)	(0.147)	(0.141)
HC_GP_Reputation	2.328	2.827	3.608*	4.410**	2.903**	2.776**
	(1.980)	(2.106)	(2.542)	(2.753)	(1.374)	(1.260)
SI_GP_Advice	0.170*	0.223	0.238**	0.283**	0.344**	0.396*
	(0.173)	(0.206)	(0.167)	(0.176)	(0.186)	(0.193)
SI_HospStat	14.26**	13.74**	7.220***	6.550***	5.371***	5.133***
	(18.84)	(15.60)	(5.008)	(4.200)	(2.932)	(2.703)
SI_DoctorRating	1.596	1.067	1.424	1.461	2.245**	2.312**
	(1.636)	(0.958)	(0.851)	(0.770)	(0.835)	(0.876)
Reliable	6.181	8.682*	6.492**	7.586***	4.457***	4.061***
	(7.691)	(9.969)	(4.993)	(5.561)	(2.351)	(2.003)
DOC_Listens	141.9*	51.44	44.20*	27.05**	22.03**	22.98**
	(424.8)	(126.4)	(90.99)	(41.26)	(28.29)	(28.34)
DOC_Explains	0.00690*	0.00680**	0.00509**	0.00695***	0.0120***	0.0124***
	(0.0183)	(0.0148)	(0.0105)	(0.0124)	(0.0171)	(0.0169)
DOC_Friend	12.88	8.375	16.48**	19.66***	8.718**	7.781**
	(29.23)	(14.65)	(22.41)	(22.45)	(8.047)	(6.896)
Participation	5.473*	5.818*	5.171**	4.162**	2.349*	2.228*
	(5.255)	(5.410)	(3.664)	(2.687)	(1.126)	(1.036)
SAT_C_GP	17.03*	8.038	6.593*	5.410**	4.692**	4.377***
	(27.58)	(10.23)	(6.659)	(4.048)	(2.889)	(2.484)
SAT_C_Hosp	21.93**	22.86**	30.01***	34.38***	17.95***	11.11***
	(33.71)	(30.90)	(33.63)	(35.43)	(15.52)	(7.578)
SAT_C_Treatment	0.0515**	0.0561**	0.111**	0.147**	0.145**	0.111***
	(0.0764)	(0.0794)	(0.106)	(0.125)	(0.111)	(0.0788)
WhiteBritish	0.0137*	0.0409*	0.0542**	0.0539**	0.0909**	0.105**
	(0.0318)	(0.0738)	(0.0782)	(0.0690)	(0.0890)	(0.0973)
Income	0.416*	0.382**	0.449**	0.513**	0.476***	0.462***
	(0.190)	(0.162)	(0.154)	(0.154)	(0.129)	(0.120)
SAT_C_Doc	0.242	0.243	0.148*	0.135*	0.427	
	(0.468)	(0.374)	(0.161)	(0.144)	(0.321)	
SI_PastExp	0.670	0.590	0.535	0.551		
	(0.787)	(0.650)	(0.576)	(0.250)		

<b>Education</b>	0.486	0.583	0.683	0.610		
	(0.526)	(0.554)	(0.443)	(0.328)		
<b>HC_Access</b>	1.046	1.124	1.241	1.347		
	(0.659)	(0.678)	(0.564)	(0.565)		
<b>HC_PastExp</b>	1.030	0.914	0.930			
	(0.578)	(0.487)	(0.397)			
<b>SI_Family</b>	1.208	1.305	1.439			
	(1.357)	(1.484)	(1.458)			
<b>DOC_Time</b>	1.223	2.099	2.594			
	(2.118)	(3.261)	(3.547)			
<b>DOC_Trust</b>	0.153	0.608	0.460			
	(0.327)	(0.983)	(0.629)			
<b>WEB_Access</b>	1.122	0.558	0.483			
	(4.345)	(1.763)	(0.918)			
<b>HC_Waiting</b>	0.960	1.097				
	(0.806)	(0.846)				
<b>HC_HospComp</b>	1.200	0.790				
	(0.929)	(0.540)				
<b>HC_CloseHome</b>	0.930	0.790				
	(0.726)	(0.516)				
<b>HC_FinPerform</b>	0.610	0.692				
	(0.621)	(0.588)				
<b>SAT_C_Time</b>	1.449	1.530				
	(1.441)	(1.280)				
<b>WhiteNonBritish</b>	0.742	0.493				
	(1.790)	(1.041)				
<b>CB_AWARE</b>	1.422					
	(3.158)					
<b>CB_Use</b>	83.93					
	(354.7)					
<b>_cut1</b>	9454769.9**	2474784.8**	3131224.6**	2460471.3***	10470831.2***	13892352.4***
	(63313549.3)	(15197453.2)	(18256829.6)	(13260544.4)	(45550085.5)	(59299449.7)
<b>_cut2</b>	7.05660e+09*	1.22556e+09***	1.14387e+09***	674102348.3***	1.42570e+09***	1.60379e+09***
	**					
	(5.66892e+10)	(8.86204e+09)	(7.69789e+09)	(4.20283e+09)	(7.17551e+09)	(7.78799e+09)

# QUESTIONNAIRE

---

## Imperial College Business School



We would be very grateful for your cooperation in completing this questionnaire. It should take around **10 minutes** to complete.

The data collected will contribute towards a study into the healthcare service in the UK. There are currently major changes taking place in the NHS, in an effort to improve the choice and quality of services available to the public. One of these changes has been the introduction of a system called “Choose & Book” which gives you the option to choose which hospital you wish to go to for your outpatient appointment, following a GP referral. This is a study into how individuals regard these new choices and how they make decisions about where to receive care. In particular, we are studying the awareness and use of online doctor rating websites as a source of information for patients. These doctor rating websites allow patients to rate their doctors and provide feedback based on their own experiences. The ratings can then be used by others when deciding where to receive health care.

All data collected will remain strictly confidential. The study is being conducted by researchers from Imperial College London and King’s College London. If you would like to be informed of the results of this study, please contact [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk).

## SECTION A

[www.iwantgreatcare.com](http://www.iwantgreatcare.com)

[www.NHSchoices.co.uk](http://www.NHSchoices.co.uk)

[www.patientopinion.co.uk](http://www.patientopinion.co.uk)

[www.privatehealth.co.uk](http://www.privatehealth.co.uk)

**Q1. Are you aware of any of the above online doctor rating websites or any other doctor rating websites?**

Yes                      No  (if No, skip ahead to Section C)

Other (please specify).....

**Q2. How did you find out about these sites?**

Family/Friends                       Doctor

The Media                       Other (please specify).....

## SECTION B

**Q3. Have you used these websites in the past to look at doctor/hospital ratings?**

Yes                       No  (if No, skip ahead to Section C)

**Q4. What specialty of doctor have you searched for in the past in these websites?**

.....

**Q5. When do you use these websites?**

On a regular basis                       Only before/after an appointment  Rarely

**Q6. In the past, has the information on these websites influenced your choice of doctor/hospital?**

Yes                       No

**Q7. If Yes, was this based on positive or negative information on the websites?**

Positive information                       Negative information

**Q8. How easy to use do you find the sites?** Please circle the most appropriate number on a scale of 1 to 5 (1=very easy, 5=very difficult)

1            2            3            4            5

## SECTION C

**Q9. Which of the following factors are important to you in making decisions about where to receive healthcare?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important), or 'none of these'.

Waiting lists	1	2	3	4	5
Rates of hospital-acquired complications	1	2	3	4	5
Clinical performance rating	1	2	3	4	5
Closeness to home	1	2	3	4	5
Familiarity with the doctor	1	2	3	4	5
Financial performance of the hospital	1	2	3	4	5
Reputation of the doctor	1	2	3	4	5
Accessibility and parking facilities	1	2	3	4	5
Past experience with the provider	1	2	3	4	5
None of these					<input type="checkbox"/>

**Q10. Which of the following sources of information are important in making decisions about where to receive health care?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important).

GP advice	1	2	3	4	5
Published hospital statistics	1	2	3	4	5
Online doctor rating website	1	2	3	4	5
Personal experiences in the past	1	2	3	4	5
Feedback from family/friends	1	2	3	4	5

**Q11. To what extent do you think that the online rating of doctors by patients is a reliable measure of a doctor's performance?** Please circle the most appropriate number on a scale of 1 to 5 (1=very unreliable, 5=very reliable)

1      2      3      4      5                      Not sure     

**Q12. If you have not used these websites before, how likely do you feel you will use them in the future?**

Not likely                       Quite likely                       Likely

---

## SECTION D

**Q13. These websites are based on patient input. Individuals can provide feedback based on their own experiences. Considering this, when would you be most likely to contribute to the online site?** Tick all that apply.

- Every time
- After particularly positive experiences only
- After particularly negative experiences only
- After both positive and negative experiences
- Never
- Not sure

**Q14. Out of the following what would be your motive for any contributions that you make to an online doctor rating site?** Tick all that apply.

- I would not contribute to these websites
- To inform other patients
- To improve standards of care in the NHS
- As a method of complaint
- In appreciation of a doctor's service
- Not sure

---

## SECTION E

**Q15. Which of the following attributes would you use to describe your GP?** Tick all that apply.

- I feel my doctor listens to my problems
- I feel my doctor spends enough time with me in each consultation
- I feel my doctor explains things clearly
- I feel my doctor is sociable and friendly



- 1  
2  
3  
4  
5  
6  
7  
8  
9
- I feel that I can trust my doctor's opinions  
 None of the above

10  
11  
12  
13

**Q16. How actively do you participate with your GP in making decisions about your health care generally?** Tick the single most appropriate.

- 14  
15  
16  
17  
18  
19  
20  
21
- My doctor always makes decisions for me  
 I like to know the options available but still let my doctor decide for me  
 My doctor and I make the decisions together  
 I make decisions for myself, after considering the advice of my GP  
 I always make my own decisions, independently of the advice of my GP  
 I make decisions with my parents/spouse/relatives

22  
23

**Q17. Within your GP practice do you always want to see the same GP for an appointment?**

- 24  
25  
26
- I always request to see the same GP  
 I don't mind which doctor I see.

27  
28  
29

**Q18. Where is choice more important to you in the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 =of no importance, 5 =very important) or select 'not sure'.

30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of appointment time (for primary & secondary care)	1	2	3	4	5	Not sure	<input type="checkbox"/>

50  
51  
52  
53  
54

**Q19. How satisfied are you with the current level of choice of where you can receive health care within the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 = strongly dissatisfied, 5 = strongly satisfied) or select 'not sure'.

55  
56  
57  
58  
59  
60

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>

Choice of doctor for outpatient appointment 1 2 3 4 5 Not sure

Choice of treatment 1 2 3 4 5 Not sure

Choice of appointment time (for primary & secondary care) 1 2 3 4 5 Not sure

**Q20. Choose and Book is a new NHS system which gives you the option to choose which hospital you wish to go to for your outpatient appointment. Are you aware of this system?**

Yes  No

**Q21. Have you used this Choose and Book system in the past?**

Yes  No

**Q22. If you have used the Choose & Book system in the past, how actively have you participated in making decisions about where to receive care? Tick the single most appropriate.**

- I have never used Choose & Book
- My doctor always makes decisions for me
- I like to know the options available but still let my doctor decide for me
- My doctor and I make the decisions together
- I make decisions for myself, after considering the advice of my GP
- I always make my own decisions, independently of the advice of my GP
- I make decisions with my parents/spouse/relative

**Q23. When is the choice of hospital important to you, for outpatient referrals? Tick all that apply.**

- Routine outpatient consultation
- Day-case procedure/surgery
- Major surgery
- None of these

---

## SECTION F

**Q24. Do you have access to a computer/laptop with internet access, at home or at work?**

Yes  No

**Q25. Have you used the internet in the past to search for health information?**

Yes  No

**Q26. If you do not use online doctor rating websites, which of the following factors stops you from doing so? Tick all that apply**

- I'm too busy to have the time to use them
- The sites are not a reliable source of information
- It is difficult to interpret the information provided
- I already have enough information from other sources to make choices
- I don't have access to the internet
- I did not know these websites existed
- I have never needed to use these websites

**Q27. What other internet websites involving ratings do you use? Tick all that apply.**

- Shopping websites (e.g. Amazon)
- Holiday websites (e.g. TripAdvisor)
- Car insurance websites (e.g. Compare The Market)
- Restaurants/venue websites (e.g. ViewLondon)
- Film websites (e.g. Rottentomatoes)
- Other (please specify).....
- I don't use any rating websites.

**Q28. What methods of rating do you feel are a useful form of feedback in these websites? Tick all that apply.**

- Star-rating out of 5
- Percentage scores
- Thumbs Up/Down
- Written comments from patients/users
- No preference

## SECTION G

We remind you that all personal data collected will remain confidential and is collected for academic purposes.

**Q29. What is your age? .....**

**Q30. What is your gender?**

Male  Female

**Q31. How would you describe your ethnicity?**

<input type="checkbox"/>	White – British	<input type="checkbox"/>	Other Asian – non-Chinese
<input type="checkbox"/>	White – Others	<input type="checkbox"/>	Black Caribbean

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

**Q32. What is your postcode? .....**

**Q33. How many other individuals do you live with? .....**

**Q34. Do you live with your parents?**

- Yes                       No

**Q35. What is/was your profession? .....**

- Unemployed                       Retired

**Q36. What is your level of pre-tax income?**

- 0
- <£15000 but >0                       £15,000-£35,000
- £35,000-55,000                       £55,000-£75,000
- £75,000-£95,000                       >£95,000

**Q37. What is your highest level of educational attainment?**

	GCSE		Other vocational degree
	A-Level		University degree
	BTEC		Postgraduate degree

**Q38. In the last year how many times have you had an outpatient hospital appointment?**

- 0 times                       1-3 times
- 4-5 times                       More than 5 times

**Q39. What is the sex of your GP?**

- Male                       Female

**Q40. How old is your GP?**

- <30 years
- 30-50 years
- >50 years

**Q41. What is the ethnicity of your GP?**

	White – British		Other Asian – non-Chinese
	White – Others		Black Caribbean

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

Q42. I cannot answer Q39, Q40, Q41 because I don't always see the same GP.

**This is the end of the questionnaire, thank you for your time.**

For peer review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stravopoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

**Declaration:** All authors have completed the Unified Competing Interest form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

**Copyright statement:** The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, a worldwide licence to the Publishers and its licensees in perpetuity, in all forms, formats and media (whether known now or created in the future), to i) publish, reproduce, distribute, display and store the Contribution, ii) translate the Contribution into other languages, create adaptations, reprints, include within collections and create summaries, extracts and/or, abstracts of the Contribution, iii) create any other derivative work(s) based on the Contribution, iv) to exploit all subsidiary rights in the Contribution, v) the inclusion of electronic links from the Contribution to third party material where-ever it may be located; and, vi) licence any third party to do any or all of the above.

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stravopoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

### Article summary

#### Article focus:

- To explore the awareness of the existence of doctor-rating and its usage among the general population.
- To understand the main predictors of what makes people aware of, and willing to use doctor-ratings websites.

#### Key messages:

- The share of the general public which uses doctor-rating websites is still quite low, ~~although significantly higher than what previously documented by the literature.~~
- Elderly, subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The doctor-patient relationship is a significant predictor of patients' awareness of, and intention to use, doctor-rating websites.

#### Strength and Limitations:

- Our study contributes to the literature of online health information where evidence on the determinants of people's awareness of and willingness to use doctor-rating websites is limited.
- The main limitation of the study is that [we use a convenience sample from it took place in](#) one borough of London, [UK](#) and therefore results cannot be [immediately generalised to the UK population.](#)

### Abstract

**Objectives:** To explore the extent at which doctor-rating websites are known and used among the general population. To understand the main predictors of what makes people aware of, and willing to use doctor-ratings websites.

**Design:** A cross-sectional study.

**Setting:** The Borough of Hammersmith and Fulham, London, England.

**Participants:** 200 individuals from the borough.

**Main outcome measures:** The likelihood of being aware of doctor-rating websites and the intention to use doctor-rating websites.

**Results:** The use and awareness of doctor-rating websites is still quite limited. Elderly, white British subjects, as well as respondents with higher income are less likely to use doctor-rating websites. The doctor-patient relationship also plays a key role in explaining awareness of and intention to use the websites: the GP-patient gender concordance is associated with higher awareness of, and intention to use, the websites. Respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

**Conclusions:** Online rating websites can play a major role in supporting patients' informed decisions on which health care providers to seek advice from, thus potentially fostering patients' choice in health care. Subjects who seek and provide feedback on doctor-ranking websites, though, are unlikely to be representative of the overall patients' pool. In particular, they tend to over-represent opinions from young, non white British, medium-low income patients who are not satisfied with their choice of the healthcare treatments and the level of information provided by their GP. Accounting for differences in the users' characteristics is important when interpreting results from doctor-rating sites.

### Key messages

- The share of the general public which uses doctor-rating websites is still quite low, ~~although significantly higher than what previously documented by the literature.~~
- Elderly, subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The GP-patient gender concordance is associated with higher awareness of, and intention to use, the websites.
- Subjects who feel that their GP explains things clearly and is a valuable source of clear information, are less likely to use online rating websites.
- Subjects who feel that they are more satisfied with the level of choice of healthcare treatments are less likely to use online rating websites.

<sup>1</sup> London School of Economics, LSE Health and Centre for the Study of Incentives in Health

<sup>2</sup> Imperial College Business School

<sup>3</sup> University of Surrey

<sup>4</sup> Imperial College School of Medicine

<sup>5</sup> King's College London

\*Corresponding author: Marisa Miraldo. Email: [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk)



## INTRODUCTION

This study aims, first, at providing direct evidence on the extent to which doctor ratings websites are known and used among the general public in a borough of London. It also aims to directly provide some novel insight on what appear to be the most significant predictors of the fact that people are aware of, and willing to use, doctor-ratings websites.

Although direct evidence on both these aspects is scant, especially for the UK, doctor rating websites are often regarded as key innovations within the broader health policy agenda aiming at enhancing patients' choice.

Both the NHS Plan<sup>1</sup> and the NHS Improvement Plan<sup>2</sup>, in fact, set out the changes required for the NHS to become more patient-focussed. Greater patient involvement in the running of the NHS has gone hand in hand with the policymakers' drive to improve the quality of public healthcare services. The 'bottom-up' approach to shape a more patient-centred NHS has typically focused on three main areas: i) giving users more choice and personalisation; ii) making funding respond to users' choices; and iii) engaging users through greater involvement. This was with the aim of creating a patient-led service promptly responding and supporting patients' health needs.<sup>3</sup>

Lord Darzi's 2008 report "High Quality Care For All - The Next Stage Review"<sup>4</sup> acknowledged that improvements to the NHS should focus on improving the quality of services, and that the best way of achieving this would be to ensure that services are locally responsive to the needs of the community. This would involve empowering providers and patients as decentralised decision-makers in order to foster a culture of continuous quality improvement and innovation.

Along this line, a number of initiatives have been introduced. In particular, *Choose and Book* is an IT service which allows patients needing an outpatient appointment to choose which hospital they are referred to by their GP, as well as the time and date of the appointment. *Choose and Book* was planned from 2003 as part of the National Program for IT (NPfIT), and has been progressively introduced from 2005 onwards. By 2009, 98% of GPs claimed to have used *Choose and Book* at some stage during the week, although only half of all secondary care appointments were being arranged using the system.<sup>5</sup>

A debate exists on whether *Choose and Book* has succeeded in actually increasing patient choice. A survey of 2,181 patients carried out in January 2009, for instance, found that only 46% were aware of having a choice of where to receive hospital care before attending their GP.<sup>6</sup> This seems to naturally lead to the issue that the capability of making informed choices crucially depends on the availability of relevant information.

Key sources of information are doctor-rating websites. Websites such as *NHS Choices* and *Dr Foster Intelligence* are also a relatively recent phenomenon in the UK. Compared to other sources of healthcare information – such as official hospital statistics – these websites claim to be more user-friendly and easy to understand.

In principle, doctor-rating websites can have a profound impact on public involvement and patients' choice in healthcare, as they potentially enable patients to make more informed decisions on where to seek healthcare, and thus to engage more often in active choices concerning their health and wellbeing.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

In practice, however, relative little evidence is available on whether, and to what extent, doctor-rating websites are actually known and actively used in the UK. A study by the Kings Fund<sup>6</sup> explored the information sources used by patients in making decisions about where to receive care. Only 4% of the patients used the NHS Choices website, with the majority instead drawing information from their own experiences (41%), advice from GP (36%), advice from friends and family (18%), and other websites (1%). Similarly, a national survey on patients' choice by the Department of Health found that the NHS Choices website was only used by 5% of respondents.<sup>7</sup> These figures are consistent with the evidence from the US where usage of doctor rating websites is relatively more diffused and established.<sup>8,9</sup>

Moreover, very little is known about the profile of individuals who are more likely to make active use of these sites. Appleby and Alvarez<sup>10</sup> found that women in England desire patient choice more than men (69% to 56%), suggesting that women may also be more likely to use patient sources of information such as rating sites. This is in line with findings from the US where women and younger adults are more active 'online health information seekers'.<sup>11</sup>

The apparently limited uptake of doctor rating sites in the UK calls into question how effective the existing websites may be as information exchange platforms from and to representative groups of patients.

Interventions that aim at enhancing the public engagement with health information on the Internet, and the representativeness of the users providing feedback online, require a thorough understanding of which characteristics drive the patients' awareness and use of online health information such as the doctor-rating websites.<sup>12-14</sup>

The aim of this study is to contribute to fill these gaps by providing more direct evidence to support decision-making.

## METHODS

We conducted a self-administered survey to assess the extent and the determinants of i) the awareness of the existence of doctor-ratings websites; ii) the level of actual usage of those websites; iii) the intention to use doctor-ratings websites in the future.

The field survey was considered the most appropriate administration mode to involve a sample of respondents from the general population. An online survey, in fact, by exclusively reaching the segment of active internet users, would have failed to address the main goal of the study, whether the users of doctor-rating websites are fairly representative of the general public.

### Questionnaire design

Prior to the data collection a pilot study was conducted. The aim of the pilot was to gain an understanding of the practicalities associated with giving out questionnaires and collecting responses. After listening to feedback from pilot respondents, and looking at results from the pilot study, several changes were made to make the questionnaire easier to understand. The changes related to content, phrasing and ordering of questions.

The content of the final questionnaire was based on findings from the preliminary literature review and was designed to have a number of sections (see Appendix for full questionnaire). In particular, section A focuses on the awareness of online rating websites, while section B assesses actual usage of online rating websites. Section C measures the willingness to use the online rating websites in the future, and explores which aspects of the healthcare providers and which sources of information are perceived as being important factors in making decisions about where to receive healthcare. Section D assesses the individual contribution to the online rating sites, while section E focuses on aspects of the doctor-patient relationship and attitudes and dimensions of patient choice. Finally section F controls for internet usage, while section G collects a broad range of socio-demographic characteristics.

Closed questions were used, worded in a manner easy to understand. A limited number of responses were provided, either with binary options (e.g. yes or no), or with a numerical Likert scale ranging from 1 to 5, with a further option for “Not sure”.

A list of variables with a brief description is discussed in the Variables section and is summarised in Table 1 in the Appendix.

### **Ethical approval, informed consent and confidentiality of responses**

We completed the checklist for research ethics approval from Imperial College London. As interviews were intended to be conducted in public places among respondents from the general population, the study involved no risk or harm of any type to respondents, no link with clinical data was expected to take place, and no incentives were going to be paid to respondents, the study fitted all the criteria in the first stage checklist with no further formal application to the Imperial College Research Ethics Committee.

At the beginning of each interview, interviewers showed credentials as research assistants at the University of London, informed respondents that their answers were anonymous and would remain strictly confidential, and that all responses and data were going to be treated statistically and used for the purposes of scientific research only. Informed consent by respondents was then given at the beginning of each interview.

### **Sample**

The survey was conducted in the field by the researchers involved in the paper. The borough of Hammersmith and Fulham was chosen for the location of the field survey because it is a transport hub in Central West London, and hosts many offices and several major business centres. The four interviewers went to different public locations within the borough (underground stations, high street and residential areas) at different times during the day (early morning, midday and in the evening) and in different days of the week (including weekends). By covering different times and locations within the borough, we aimed at being able to approach both working and non-working members of the public. During the surveys in the field, the interviewers approached every third male and third female that would pass by them. A target of 200 respondents was envisaged, which was readily achieved, since only 68 subjects who were initially approached refused to take part to the survey, with a final response rate of 74%.

## Statistical analysis

We have carried a multiple regression analysis which aims to explore the determinants of i) being either aware or not of doctor rating websites; and ii) the individual intention of using these websites in the future.

The dependent variable in the first case is modeled as a binary variable (*Awareness*) taking values 1 or 0 for the respondents who reported to be aware or unaware of the websites, respectively. The second dependent variable is instead modeled as a discrete ordered variable (*IntentionToUse*) taking values 1, 2, and 3 for subjects reporting to be 'not likely', 'quite likely', and 'likely' to use the websites in the future, respectively.

The explanatory variables ( $X_i$ ) include the variables described in Table 1, namely: individual socio-demographic characteristics; a set of variables on the characteristics of the healthcare providers that the respondents consider important for making their decisions on where to receive health care; a set of variables on the sources of information that are important in making decisions about where to receive health care; two dummy variables that capture whether the patient's gender and age are the same, or within a comparable range, respectively, than the gender and age of her GP; a set of variables that describe the respondents' feelings about their relation with their doctor; a variable indicating the level of participation of the respondents in their GPs' decisions; a set of variables on patients' satisfaction with the level of choice in their healthcare decisions; a dummy variable controlling for whether the subjects had access to internet at home or at work; a variable on awareness of the existence of doctor-rating websites; and a variable on whether the subject always asks to see the same GP (see Table 1 for variables' details). The choice of the explanatory variables was further informed by the bivariate correlation analysis reported in Table 2 in the Appendix.

We employed a binary logistic and an ordered logistic model to fit the *Awareness* and the *IntentionToUse* discrete variables, respectively, to ensure a reasonable comparability between the empirical results obtained for the two set of regressions. The two models, in fact, only differ in the number of values that the dependent variables can take, while the underlying structure of the error terms follows the same standardized logistic distribution. The logistic specification is particularly appealing because its results can be readily expressed in terms of odds ratio. We have, however, conducted a robustness check by replicating the multiple regression analysis using the alternative binary and ordered probit specifications, which assume a Gaussian error term and present results in terms of estimated coefficients instead of odds ratio. The two set of regressions provide consistent estimates and results which are qualitatively fully aligned. Results of the probit specifications are available, upon request, from the authors.

All the regression analysis has been conducted using STATA v.11.

## **RESULTS**

### Descriptive statistics

1  
2  
3  
4 Descriptive statistics of all the dependent and independent variables for the resulting  
5 sample of respondents to our survey are provided in detail in Table 1, and here we briefly  
6 report their main aspects. As a result of the convenience sampling, our resulting sample  
7 consisted in 141 workers (ten of which reported to be currently unemployed), 33 students,  
8 nine officially unemployed and six retired subjects. Eleven respondents did not report  
9 their working status.

10  
11 As common in field surveys of this type, the convenience sampling tended to over-  
12 represent respondents who were currently not working, or were at home, and thus had  
13 time to fill out the questionnaire: the proportion of subjects who were not currently  
14 working, as given by the sum of the respondents who reported to be unemployed, retired,  
15 or students, indeed amounts to 29% of the sample.

16  
17  
18 Related to that, it turned out that 9.5% of the respondents in our sample were currently  
19 unemployed, compared to only 5% from the Census data for the borough. The relatively  
20 higher proportion of unemployed respondents may also be a result of the convenience  
21 sampling method. Moreover, an unemployment rate higher than the one documented in  
22 the 2001 Census survey was largely expected, due to the consequences of the economic  
23 and financial crisis after 2007.

24  
25  
26 Comparing the sample with the Census data for the borough the mean age of our sample  
27 was slightly older than that for the borough (39.57 years compared to 35.2 years).<sup>15</sup> Our  
28 sample however was closer to the national mean age of 38.5 years. The range of ages  
29 seems to show a positive skew, with a greater frequency of people aged 40 years and  
30 under. This is consistent with the 2001 census data for Hammersmith and Fulham which  
31 showed the borough contained a larger proportion of young people aged 20-29 (23.8%)  
32 than the rest of England (12.66%) (ONS, 2001).<sup>15</sup> Age is an important demographic to  
33 consider when analysing our results as age has been shown to be important in internet  
34 usage.<sup>11</sup>

35  
36  
37 Also, the sample had a slightly greater proportion of females than the borough (54.44% to  
38 52% respectively), and a lower proportion of 'White British' ethnicity (48.79% compared  
39 to 58% for the borough).<sup>15</sup> This is also significantly lower than figures for England, White  
40 British accounting for 87% of the population.<sup>15</sup> The sample contained 28.99% non white  
41 respondents. This is higher than the 2001 census data for Hammersmith and Fulham  
42 which was 22% and significantly higher than the figures for England, showing non white  
43 ethnic groups accounting for 9% of the total population.<sup>15</sup> Our sample, therefore, allows  
44 controlling for high heterogeneity in ethnic background even with a limited sample size.

45  
46  
47 The majority of actively working respondents reported an income within the £15-35,000  
48 bracket. Income is an important variable to control for in the analysis, as previous  
49 literature found that patients using the Internet were more educated and had higher  
50 incomes.<sup>16</sup>

51  
52  
53 Our sample had a high percentage of people with higher level qualifications: 46.24% of  
54 the sample had a university degree and 27.96% had a postgraduate degree. This is  
55 reflective of Hammersmith and Fulham, where 45% of the population have a qualification  
56 of degree level or higher, a figure which is significantly higher than in England, where  
57 only 19.8% have a degree or higher qualification.<sup>15</sup>

## Results on awareness

Only 29 of our respondents were aware of the doctor-rating websites they were asked about. This corresponds to less than 15% of our sample, indicating that the awareness and, consequently, usage of these online sources is still quite limited in the UK, although significantly higher than what the previous studies have shown.<sup>6</sup>

A slow uptake of online ratings has also been reported in the US, a more market-oriented health system. It is indicative that only 6% of Americans were aware of Hospital Compare, the quality reporting website maintained by the Centres for Medicare and Medicaid Services (CMS).<sup>17</sup>

In Table 3 we present the estimate results of four different specifications of the binary logistic regression for the dependent variable *Awareness* with different sets of regressors, which are presented in terms of the odds ratio, together with the standard errors, and levels of significance.

### [Table 3 in here]

Among the demographic factors, age and ethnicity are the only significant variables. Older individuals are less likely to be aware of the rating websites, which does not constitute a surprise, as they are usually less familiar with the use of internet in general. Moreover, in most specifications, white British and white non-British respondents appear less likely to be aware of the websites.

Among the broader socio-demographic factors, only income is sometimes (marginally) significant, pointing to the fact that respondents with higher reported levels of income tend to be less aware of the websites, while neither education or gender turn out to be significant predictors of awareness.

Looking at the characteristics of the providers that respondents consider important in making their decisions on where to receive healthcare, in one specification the reputation of the doctor has a strong positive effect, while both clinical and financial performance rates of the providers show negative significant effects. Thus, the respondents who consider the reputation of the doctor important in deciding where to receive care are more likely to be aware of the rating websites, while this is less often the case for respondents putting a higher weight on financial or clinical performance ratings, perhaps signalling that those respondents may be more familiar with alternative sources of information.

Concerning the sources of information, in one specification respondents who consider the hospital statistics important in deciding where to receive care, turn out to be more likely of being aware of the rating websites, with an effect which is particularly significant and quite remarkable in terms of odds ratio. This may signal the possible existence of 'complementary' effects between the two sources of information, according to which

1  
2  
3 individuals who give importance to hospital statistics are also more likely to actively seek  
4 for doctor rating websites.

5  
6 Furthermore, although in one specification the respondents who feel that their GPs spend a  
7 sufficient time in their consultation are less likely to be aware of the internet rating  
8 websites, both the statistical significance and the estimated odds ratio do not appear robust  
9 across specifications. Although all other variables on doctor-patient relationship were not  
10 significant, whenever included among the regressors, the gender match between the GP  
11 and the patient predicts higher awareness of the website ratings, with a noticeable effect as  
12 evident by the reported value of the odds ratio.

13  
14 From those that were aware of the existence of doctor-rating websites only 6 have  
15 reported to have used these websites. In light of this low usage rate, and of the consequent  
16 limitations of conducting statistical estimations with very little variation in the dependent  
17 outcomes, we have thus focused the rest of the analysis on the determinants of the  
18 intention to use, rather than actual usage of, doctor rating websites.

### 21 22 Results on the likelihood to use online rating websites

23  
24 In Table 4 we present the estimate results of six different specifications of the ordered  
25 logistic regression for the dependent variable *IntentionToUse* with different sets of  
26 regressors, which are presented in terms of the odds ratio, together with the standard  
27 errors, and levels of significance.

28  
29 **[Table 4 in here]**

30  
31 Concerning socio-demographic variables, it turns out that white British, as well as  
32 respondents who reported income in higher brackets, said they were less likely to use  
33 doctor-rating websites. Moreover, we do not find any effect of education, age and gender  
34 of the respondents on the likelihood of their intention to use (the results of the  
35 specifications including the age and gender variables are not reported in the table for the  
36 sake of space but are available from the authors upon request).

37  
38 Looking at the characteristics of the healthcare providers that respondents perceived as  
39 important while making decisions where to receive healthcare, our data suggest that those  
40 who consider clinical performance and doctor reputation (in most specifications) as  
41 important factors, are more likely to use doctor-rating websites. These results are  
42 consistent with the nature of the information provided in these websites. Also, and quite  
43 intuitively, subjects who consider the familiarity with their doctor an important factor to  
44 decide where to seek healthcare, tend to be less likely to intend to use websites.

45  
46 Concerning the role of the different sources of information on the decisions of where to  
47 seek healthcare, respondents who see published hospital statistics as important sources of  
48 information are more likely to use the rating websites. On the other hand, and  
49 interestingly, those for whom GP advice is an important source of information for decision  
50 making are less likely to use doctor-rating websites.

51  
52 Also the nature of the doctor-patient relationship seems to play a key role in explaining  
53 whether respondents intend to use online rating websites. First, patients with GPs of the

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

same gender tend to be more likely to use the websites. Second, respondents for whom the doctor is able to listen to them, and who perceive the nature of the relationship with their GP as friendly, also tend to be more likely to use the websites. Third, respondents who feel that their doctor explains things clearly are less likely to use online rating websites. Fourth, it also transpires that the more autonomy patients have in their healthcare decisions, the more likely they are to be willing to use the rating websites.

Finally, concerning, the interaction between levels of satisfaction for the healthcare services within the NHS, and the intention to use doctor-rating websites, it is interesting to note that those that have reported to be more satisfied with the level of choice of GP, and with the amount of choice of the hospital to receive outpatient appointments, are more likely to use these websites. On the other hand, the respondents that are more satisfied with the level of choice of treatments are less likely to use the websites.

## DISCUSSION

In this section we briefly discuss our main findings on i) the determinants of the awareness of doctor rating websites; ii) the actual usage of the websites; and iii) the determinants of the intention to use them in the future.

### Awareness

As for the determinants of being aware of the doctor rating websites, we see the significant and positive effect by the gender match between the GP and the patient as a particularly interesting finding. The doctor-patient gender concordance, in fact, has often been reported in the literature as a factor associated with higher patient satisfaction with the consultation as well as better outcomes.<sup>18</sup> If we interpret the gender match variable as an indication of satisfaction with the consultation, our finding indicates that being aware of the doctor-rating websites is not necessarily the result of a poor consultation. Instead, the Internet and the doctor are likely to be seen as complementary, rather than alternative, information channels.

### Actual usage

Concerning the low reported rate of active usage of doctor rating websites, the finding is not too surprising given that the survey was done among the general population: the reason why many more respondents were aware of the online ratings than did actually use it may simply be because those subjects did not actually need to see a doctor. Generally speaking, the finding is consistent with previously reported levels of usage in the UK. In particular, a study by the Kings Fund<sup>6</sup> that explored the information sources used by patients in making decisions about where to receive care, found that only 4% of the patients used the *NHS Choices* website, with the majority instead drawing information from their own experiences (41%), advice from GP (36%), advice from friends and family (18%), and other websites (1%). Similarly, a national survey on patients' choice by the Department of Health found that the *NHS Choices* website was only used by 5% of respondents.<sup>7</sup>



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

The proportion of active users in our survey is also consistent with evidence from the US on the limited usage of doctor rating websites. Gao et al.<sup>9</sup> analysed 386,000 national ratings from 2005-2010 in the US and showed that only 1 out of 6 physicians among those included in the study had received some rating. Lagu, Hannon, Rothberg et al.<sup>8</sup> also reported a low average number of ratings per physician.

### Intention to use

The result that shows that white British and respondents who reported income in higher brackets said that they were less likely to use doctor-rating websites, is partly in contrast to what found by the previous literature<sup>16,19,20</sup> and can signal that white British subjects and respondents with higher self-reported income may feel less in need of checking online doctor ratings, perhaps because they may also have private, or employer-paid, health insurance schemes, or because they are in the position of directly accessing alternative sources of information through their networks of acquaintances. Another possible explanation may be that white British individuals may trust less information that exists online and they have more concerns about confidentiality issues as shown in a study among different socio-economic groups in the US by Brodie et al.<sup>12</sup> As the estimated effect of these variables appear to be robust across all empirical specifications, these findings seem to suggest that online doctor-rating websites are likely to be particularly attractive to subjects with non-white British ethnicity and less favoured economic background.

On the other hand, the lack of statistical significance in the ordered logit estimates, seems to suggest that while age can be a significant factor in explaining the awareness of Internet for health information, it is not significantly explaining the intention to use doctor-rating websites once subjects are made aware of their existence. The analogous lack of significance for the respondents' gender, on the other hand, does not support the view that women in the UK may be more likely to use patient sources of information and rating websites, although they have been found to desire patient choice more than men (69% to 56%).<sup>10</sup> Both results differ from the findings from the US, where women and younger adults are more active 'online health information seekers'.<sup>11</sup>

From the perspective of the doctor-patient relationship, the finding that patients with GPs of the same gender tend to be more likely to use the websites is of particular interest, and it is consistent with the analogous effect found for the likelihood of being aware of those websites. Considered together these findings point to the possible explanation that the doctor and the Internet may sometimes be seen by patients as "complementary", rather than alternative, information channels.<sup>19</sup> This interpretation is further confirmed by the finding that respondents for whom the doctor is able to listen to them, and who perceive the nature of the relationship with their GP as friendly, also tend to be more likely to use the websites.

On the other hand, there may be other dimensions in the patient-doctor relationship which seem to rather point to a "substitute" relationship with information on the Internet. For instance, the fact that respondents who feel that their doctor explains things clearly are less likely to use online rating websites, suggests that when they are generally more satisfied with the feedback provided by their doctor they are less concerned about finding about alternative doctors and compare them with their current GP.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

This result on a “substitute relationship” is consistent with previous evidence by Diaz and colleagues<sup>16</sup> that found that 11% of their respondents said they would rather use the Internet ‘instead of seeing or speaking with their doctors’, and that 59% of respondents ‘did not discuss information with their doctors’. It also seems in line with the study by McMullan<sup>19</sup> that indicates that patients who become dissatisfied with the information provided to them by the health professionals are more likely to seek confirmation of the information given and additional information on the Internet.

As for the other aspects of the patient-doctor relationship, the finding that the more autonomous -patients are in their healthcare decisions, the more willing they are to use the rating websites is also consistent with previous evidence: a study by McMullan<sup>19</sup>, for instance, reports that patients would seek health information before a consultation ‘to manage their own healthcare independently’. These may be the type of people who are ‘more likely to be health-oriented’ or ‘health conscious’, and therefore be more proactive in consultations.<sup>21</sup>

Moreover, the positive association between willingness to use doctor rating websites and levels of satisfaction with the level of choice of GP, and of outpatient appointments in the hospital, can be considered as reinforcing the above discussed interpretation that some dimensions of the doctor-patient relationship may be “complementary” with online information. For instance, patients who are more satisfied with their GP because they feel the latter is more friendly and empathic may also be more likely to engage more actively with health and healthcare information more generally. These results, together with the finding that the respondents who are more satisfied with the level of choice of treatments are less likely to use the websites, suggest that the choice of doctors and providers may be seen as only instrumental for the choice of treatment, and therefore respondents that are happy with treatment choice levels are less likely to shop around for different doctors’ opinions.

### General discussion

Overall, our evidence on the determinants of both awareness and intention to use is broadly consistent with recent findings from the literature. Indeed, a study by Stevenson and colleagues<sup>22</sup> shows that although patients use the Internet increasingly more, they show no intention of doing so with the aim of disrupting the existing balance of roles during the doctor-patient consultation. They all mentioned the Internet as an additional resource of health and healthcare information. Other evidence suggests that patients with hypertension who search for more information on the Internet, in addition to that they receive from their doctor, may be more engaged in their treatment, and therefore more willing to adhere to medication prescribed by them.<sup>23</sup>

Our findings that online information can be used not only as “substitute” but also, and perhaps mainly, as “complementary” to several dimensions of the doctor-patient relationship do not seem to entail any particular evidence suggesting that online ratings may put in danger the doctor-patient relationship, an important aspect which has been raised in the literature.<sup>24,25</sup>

The “complementarity” findings, in particular, seem consistent with the evidence from the US which shows that the vast majority of the reviews by patients are generally rather positive.<sup>8,9,26</sup> Taken together, this evidence can be seen as providing little support to the

1  
2  
3 related concern that the likeliest to use online ratings and enter actual comments may be  
4 the most disgruntled patients.<sup>27</sup>

5  
6 On a related topic, concerns have been expressed about the ability of online ratings to  
7 truly reflect the quality of care. A recent UK study, however, demonstrated a strong  
8 relationship between the ratings reported online and more objective measures of clinical  
9 quality such as mortality and infection rates,<sup>28</sup> while another study showed that online  
10 ratings were associated with ratings derived from a traditional paper-based survey.<sup>29</sup>  
11 Online ratings, thus, do not seem to provide systematically biased or misleading  
12 information regarding the health care that patients receive, at least not more than a  
13 traditional survey would do. Consistently with this evidence, our results seem to support  
14 the idea that patients may see online ratings as a supplementary information base to be  
15 used in support of direct interaction with their doctor, which remains the most significant  
16 and reliable information channel.<sup>30</sup>

17  
18  
19 More generally, the evidence provided by our study confirms that the actual usage of  
20 doctor-rating websites in the UK remains particularly low. In our sample only 29  
21 respondents out of 200 were aware of the existence of the patient rating websites. Among  
22 these, however, only 6 subjects reported they were actually using those websites.

23  
24  
25 While these figures are substantially in line with previous evidence brought forward from  
26 the literature,<sup>6,7</sup> considered together these results may pose serious concerns on the reasons  
27 and consequences of the lack of patient awareness and usage.

28  
29 Previous studies in the US have reported a number of reasons behind this slow uptake,  
30 including i) the preference for more traditional information channels, such as  
31 recommendations by family and friends; ii) the lack of time; and iii) in many cases the fact  
32 that people do not recognise that the quality of care may vary.<sup>25</sup>

33  
34  
35 Our study confirms that not only awareness of rating websites is still limited among the  
36 general public in the UK, but awareness per se does not seem a sufficient condition to  
37 guarantee active usage. This poses a double challenge from a clinician and health policy  
38 perspective.

39  
40  
41 In fact, on the one hand, the documented correlation between online ratings and other  
42 measures of healthcare quality, including survey-based ratings and clinical quality  
43 indicators,<sup>28,29</sup> necessarily requires that patients have already gone through two  
44 preliminary hurdles, namely i) being aware of, and ii) being active users of the doctor  
45 rating websites. If the ultimate goal is indeed the continuous enhancement of healthcare  
46 quality, the effective removal of this double hurdle is likely to become the next priority to  
47 guarantee the full spread of online rating website.

48  
49 On the other hand, while appropriate online and offline informational campaigns are likely  
50 to overcome the first hurdle, thus effectively raising patients' awareness of online ratings  
51 as a potential source of information on provider quality, informational campaigns alone  
52 can fail to effectively trigger changes in behaviour. Alike in several other health contexts,  
53 in fact, 'nudging' behaviour may be difficult as a mere consequence of accessing more  
54 information.

55  
56  
57 If this is the case, other avenues should be explored to increase the active usage of rating  
58 websites by patients who are already aware of them. For instance, the evidence brought  
59

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

forward by the present study confirms the importance of the doctor-patient relationship as a factor determining individuals' awareness of and willingness to use online ratings<sup>25,31-34</sup> and suggests that tailored behavioural interventions based on the doctor-patient relationship have the potential to help patients to overcome this last hurdle and actively engage with online ratings.

### **Limitations of the study**

While dictated by practical issues, the convenience sampling is a limitation of the study, and tends to over-represent respondents who are currently not employed, such as unemployed, retired and students. Also the fact that the study was conducted in only one borough of London limits the possibility to immediately generalise the findings to the broader UK population.

In an attempt to make such limitations of smaller concern to enhance the external validity and generalisability of the analysis, we have i) chosen a borough which comprises a mix of both affluent and deprived neighbourhoods from heterogeneous ethnic backgrounds; ii) conducted surveys in the field at different public locations and at different times of the day and of the week to approach both working and non-working members of the public; and iii) controlled for a wide range of socio-demographic measures in the statistical analysis.

### **CONCLUSIONS**

This study brings forward direct evidence suggesting that the awareness and actual usage of doctor-rating websites in the UK remains particularly low. In a sample of the general public from a borough of London only 29 respondents out of 200 were aware of the existence of the patient rating websites, and only 6 reported to be actually using those websites.

By collecting a broad range of information on the socio-demographic characteristics of the respondents, their views and perceptions of the most important aspects of healthcare quality, patient choice, and doctor-patient relationship, the study also explicitly explores the determinants of respondents' awareness of the doctor ratings websites, and of their intention to use the sites in the future.

Among other results, the statistical analysis provides evidence that the GP-patient gender concordance is associated with higher awareness of, and intention to use, the websites, while respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

The existence of both "substitute" and "complementary" effects between the doctor-patient and the Internet information channels is not at all conflicting. In fact, they both indicate that the level of concordance achieved during the consultation is likely to define whether or not individuals will seek for further information channels, such as the Internet.

1  
2  
3  
4 When the outcome of a consultation does not satisfy the patient, the use of Internet fills  
5 the gap of information needs. The intention to use online doctor-rating websites in this  
6 case also indicates that these patients are likely to look at these websites with the aim of  
7 seeking for another clinician. Individuals who are satisfied with their GPs may also search  
8 these websites, but more as an additional information channel as they seem keener to  
9 engage more actively with health and healthcare information in general.

10  
11 The findings of our study thus contribute also to the wider debate on the inter-  
12 relationships between Internet usage and the doctor-patient relationship.<sup>8,25,26, 31-34</sup> The  
13 argument, sometimes addressed by the previous literature, that information on the Internet  
14 can threaten the trust relationship and the balance of roles between doctors and patients,  
15 seems a concern which is not supported by our evidence. If any, a potential challenge to  
16 the doctor-patient relation can only affect the patients who already feel dissatisfied with  
17 the ability of their doctor to listen to them and provide them enough information regarding  
18 their condition, or with the level of their choice for healthcare treatments.

19  
20  
21 The above, however, can hardly be seen as a serious threat by those who advocate a  
22 greater choice by patients. On the contrary, if the latter is indeed a priority in the health  
23 policy agenda, online information on healthcare providers should be seen as a challenging  
24 opportunity to enhance patients' choice in healthcare, and public engagement with health  
25 information, especially for the less favoured segments of the population. Indeed, our  
26 findings suggest that subjects of non-white background and with lower income are more  
27 willing to use online ratings.

28  
29  
30 Finally, our study highlights that subjects who use doctor rating websites are unlikely to  
31 be representative of the overall patients' pool. In particular, they tend to over-represent  
32 opinions from young, non-white British, medium-low income patients who are not  
33 satisfied with their choice of healthcare treatments. Accounting for differences in the  
34 users' characteristics is important when interpreting results from doctor-rating sites and  
35 when informing interventions that aim at enhancing the public engagement with health  
36 information on the Internet, and the representativeness of the users who seek and provide  
37 feedback online.

38  
39  
40  
41  
42  
43 **Data sharing:** technical appendix, statistical code and dataset available from the  
44 corresponding author at [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk). Consent for data sharing was not  
45 obtained but the presented data are anonymised and risk of identification is low.

46  
47 All authors had full access to all the data in the study and take responsibility for the  
48 integrity of the data and the accuracy of the data analysis.

49  
50  
51 **Funding:** this piece of work has not received any specific funding.

## REFERENCES

1. [Department of Health. The NHS Plan: a plan for investment, a plan for reform. Crown 2000. Cm 4818-I.](#)
2. [Department of Health. The NHS Improvement Plan: Putting people at the heart of public services. London: The Stationery Office 2004. Cm 6268.](#)
3. [Department of Health. Creating a patient-led NHS: Delivering the NHS Improvement Plan. London: The Stationery Office 2005.](#)
4. [Department of Health. High Quality Care For All: NHS Next Stage Review final report. London: The Stationery Office 2008. Cm 7432.](#)
5. [House of Commons Public Accounts Committee. The National Programme for IT in the NHS: Progress since 2006. London: The Stationery Office 2009.](#)
6. [Dixon A, Robertson R, Appleby J, et al. Patient Choice. London: The Kings Fund 2010 \[http://www.kingsfund.org.uk/publications/patient\\\_choice.html\]\(http://www.kingsfund.org.uk/publications/patient\_choice.html\)](#)
7. [Department of Health. Report of the National Patient Choice Survey, England. Crown 2008.](#)
8. [Lagu T, Hannon NS, Rothberg MB, et al. Patients' Evaluations of Health Care Providers in the Era of Social Networking: An Analysis of Physician-Rating Websites. J Gen Intern Med 2010;\*\*25\*\*\(9\):942-6.](#)
9. [Gao GG, McCullough JS, Agarwal R et al. A Changing Landscape of Physician Quality Reporting: Analysis of Patients' Online Ratings of Their Physicians Over a 5-Year Period. J Med Internet Res 2012; \*\*14\*\*\(1\):e.38.](#)
10. [Appleby J, Alvarez A. Public Responses to NHS Reform. In British Social Attitudes Survey 22nd Report, London: Sage Publications 2005.](#)
11. [Ybarra M, Suman M. Help seeking behavior and the Internet: A national survey. Int J Med Inform 2006;\*\*75\*\*\(1\): 29-41.](#)
12. [Brodie M, Flournoy RE, Altman DE, et al. Health information, the Internet, and the digital divide. Health Affairs 2000; \*\*19\*\*\(6\): 255-265.](#)
13. [Gustafson DH, Hawkins RP, Boberg EW, et al. CHES: 10 years of research and development in consumer health informatics for broad populations, including the underserved. International Journal of Medical Informatics 2002; \*\*65\*\*: 169-177.](#)
14. [Car J, Lang B, Colledge A, Ung C, Majeed A. Interventions for enhancing consumers' online health literacy. Cochrane Database of Systematic Reviews 2011; \*\*6\*\*: Art. No.: CD007092. DOI: 10.1002/14651858.CD007092.pub2.](#)
15. [Office for National statistics. 2001 Census: Key Statistics. 2001. Available from: <http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.doa=3&b=276755&c=hammersmith&d=13&e=15&g=334516&i=1001x1003x1004&m=0&r=1&s=1273150763921&enc=1&dsFamilyId=47>](#)
16. [Diaz JA, Griffith RA, Ng JJ, et al. Patients' use of the Internet for medical information. J Gen Intern Med 2002;\*\*17\*\*\(3\): 180-185.](#)
17. [Kaiser Family Foundation, 2008 Update on consumers' views of patient safety and quality information. Kaiser Family Foundation. <http://www.kff.org/kaiserpolls/posr101508pkg.cfm>.](#)
18. [Bertakis KD. The influence of gender on the doctor-patient interaction. Patient Educ Couns 2009;\*\*73\*\*\(3\): 356-60.](#)
19. [McMullan M. Patients using the Internet to obtain health information: how this affects the patient-health professional relationship. Patient Educ Couns 2006;\*\*63\*\*\(1-2\): 24.](#)

20. [Cotten SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. Soc Sc Med 2004;59\(9\): 1795-1806.](#)
21. [Dutta-Bergman MJ. Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. J Med Internet Res 2004;6\(2\): e15.](#)
22. [Stevenson FA, Kerr C, Murray E, et al. Information from the Internet and the doctor-patient relationship: the patient perspective – a qualitative study. BMC Fam Pract 2007;8: 47.](#)
23. [Stavropoulou C. Perceived information needs and non-adherence: evidence from Greek patients with hypertension. Health Expect Published Online First: 17 April 2011. doi: 10.1111/j.1369-7625.2011.00679.x](#)
24. [McCartney M. Will doctor rating sites improve the quality of care? BMJ 2009; 338b 1033.](#)
25. [Lagu T and Lindenauer PK. Putting the public back in public reporting of health care quality. JAMA 2010;304\(15\):1711-1712.](#)
26. [López A, Detz A, Ratanawongsa N, et al. What Patients Say About their Doctors Online: A Qualitative Content Analysis. J Gen Intern Med 2012;27\(6\):685-92.](#)
27. [Wachter B. The patient will rate you now. 2012 Available at: <http://community.the-hospitalist.org/2012/03/19/the-patient-will-rate-you-now>](#)
28. [Greaves F, Pape U, King D, et al. Associations between internet-based patient ratings and conventional surveys of patient experience in the English NHS: an observational study. BMJ Qual Saf 2012; 21: 600-605.](#)
29. [Greaves F, Pape UJ, King D, et al. Associations between Web-based patient ratings and objective measures of hospital quality. Arch Intern Med 2012;172: 435-436.](#)
30. [Coulter A, Ellins J, Swain D, et al. Assessing the quality of information to support people in making decisions about their health and healthcare. Picker Institute Europe. 2006 Nov. Retrieved from \[http://www.pickereurope.org/assets/content/pdf/Project\\\_Reports/Health-information-quality-web-version-FINAL.pdf\]\(http://www.pickereurope.org/assets/content/pdf/Project\_Reports/Health-information-quality-web-version-FINAL.pdf\)](#)
31. [Nwosu CR, Cox BM. The impact of the Internet on the doctor-patient relationship. Health Informatics Journal 2000;6\(3\): 156-161.](#)
32. [Broom A. Virtually He@lthy: The Impact of Internet Use on Disease Experience and the Doctor-Patient Relationship. Quality Health Research 2005;15\(3\): 325-345.](#)
33. [Gorrindo T. Web searching for information about physicians. JAMA 2008; 300\(2\), 213.](#)
34. [Malone M, Mathes L, Dooley J et al. Health information seeking and its effect on the doctor–patient digital divide. Journal of Telemedicine and Telecare 2005; 11 \(Suppl.1\): S1:25–28.](#)

**Appendix 4**  
**Table 1 Variable description and descriptive statistics**

<u>Variable</u>	<u>Obs</u>	<u>Mean</u>	<u>Std. Dev</u>
<u>Awareness (<i>Awareness</i>) (0=no, 1=yes)</u>	200	0.142	0.350
<u>Intention to use (<i>IntentionToUse</i>)</u>	199	2.136	0.743
<u>Not likely</u>	43		
<u>Quite likely</u>	86		
<u>Likely</u>	70		
<u>Important factors in making decisions (1=not important at all, 5=very important)</u>			
<u>Waiting lists (<i>HC_Waiting</i>)</u>	198	3.818	1.165
<u>Rates of hospital-acquired complications (<i>HC_HospComp</i>)</u>	188	3.761	1.193
<u>Clinical performance (<i>HC_Clinical_Performance</i>)</u>	189	4.037	1.136
<u>Closeness to home (<i>HC_CloseHome</i>)</u>	200	3.683	1.265
<u>Familiarity with the doctor (<i>HC_Familiarity</i>)</u>	194	3.237	1.306
<u>Financial performance of the hospital (<i>HC_FinPerform</i>)</u>	191	2.387	1.164
<u>Reputation of the doctor (<i>HC_GP_Reputation</i>)</u>	199	3.980	1.137
<u>Accessibility and parking facilities (<i>HC_Access</i>)</u>	192	2.656	1.321
<u>Past experience with the provider (<i>HC_PastExp</i>)</u>	193	3.544	1.311
<u>Important sources of information in making decisions (1=not important at all, 5=very important)</u>			
<u>GP advice (<i>SI_GP_Advice</i>)</u>	198	4.071	1.030
<u>Published hospital statistics (<i>SI_HospStat</i>)</u>	183	2.934	1.193
<u>Online doctor rating websites (<i>SI_DoctorRating</i>)</u>	178	2.315	1.204
<u>Personal experiences in the past (<i>SI_PastExp</i>)</u>	192	4.234	1.004
<u>Feedback from family/friends (<i>SI_Family</i>)</u>	194	4.149	0.924
<u>I feel the doctor...</u>			
<u>...listens (0=no, 1=yes) (<i>DOC_Listens</i>)</u>	200	0.575	0.496
<u>...has time (0=no, 1=yes) (<i>DOC_Time</i>)</u>	200	0.410	0.493
<u>...explains (0=no, 1=yes) (<i>DOC_Explains</i>)</u>	200	0.555	0.498
<u>...is friendly (0=no, 1=yes) (<i>DOC_Friend</i>)</u>	200	0.445	0.498
<u>... Is someone I can trust (0=no, 1=yes) (<i>DOC_Trust</i>)</u>	200	0.550	0.499
<u>I feel that online rating is a reliable measure (1=very unreliable, 5=very reliable) (<i>Reliable</i>)</u>	141	2.759	1.055
<u>How actively do you participate with your GP in making decisions (<i>Participation</i>)</u>	193		
<u>My doctor always makes decisions for me</u>	2		
<u>I like to know the options available but still let my doctor decide for me</u>	13		
<u>My doctor and I make the decisions together</u>	25		
<u>I make decisions for myself, after considering the advice of my GP</u>	65		
<u>I always make my own decisions, independently of the advice of my GP</u>	75		
<u>I make decisions with my parents/spouse/relatives</u>	13		
<u>Satisfied with the current level of choice of... (1 = strongly dissatisfied, 5 = strongly satisfied)</u>			
<u>...GP (<i>SAT_C_GP</i>)</u>	173	3.451	1.138
<u>...hospital (<i>SAT_C_Hosp</i>)</u>	152	3.493	1.055
<u>...doctor (<i>SAT_C_Doc</i>)</u>	139	3.252	1.022
<u>...treatment (<i>SAT_C_Treatment</i>)</u>	148	3.554	0.928
<u>...time spent (<i>SAT_C_Time</i>)</u>	168	3.179	1.123



<b>Ethnicity</b>				
<b>White British (0=no, 1=yes) (WhiteBritish)</b>	200	0.488	0.501	
<b>White Other (0=no, 1=yes) (WhiteNonBritish)</b>	200	0.222	0.417	
<b>Highest level of educational attainment* (Education)</b>				
<b>1 if GCSE</b>	12			
<b>2 if A-Level/BTEC/Vocational</b>	36			
<b>3 if University undergraduate degree</b>	86			
<b>4 if Postgraduate Degree</b>	52			
<b>Age (years) (Age)</b>	199	39.572	16.083	
<b>Gender (Gender)</b>				
<b>Female (=1)</b>	112			
<b>Male (=0)</b>	88			
<b>Income (Income)</b>				
<b>0</b>	40			
<b>&lt;£15000 but &gt;0</b>	27			
<b>£15,000-£35,000</b>	36			
<b>£35,000-55,000</b>	22			
<b>£55,000-£75,000</b>	14			
<b>£75,000-£95,000</b>	7			
<b>&gt;£95,000</b>	14			
<b>Doctor-patient concordance</b>				
<b>Age Match (=1 if doctor and patient belong to the same age bracket; =0 otherwise) (AgeMatch)</b>	200	0.333	0.473	
<b>Gender Match (=1 if patient and doctor are of same gender; =0 otherwise) (GenderMatch)</b>	200	0.444	0.498	

Table 2: Bivariate Correlations

	<u>IntentionToUse</u>	<u>Awareness</u>		<u>IntentionToUse</u>	<u>Awareness</u>
<u>IntentionToUse</u>	1		<u>DOC Friend</u>	0.0127 (0.8599)	-0.0984 (0.1667)
<u>Awareness</u>	0.0846 (0.2359)	1	<u>DOC Trust</u>	-0.0288 (0.6899)	-0.0388 (0.5863)
<u>HC Waiting</u>	0.1617** (0.025)	0.016 (0.8236)	<u>Participation</u>	0.0412 (0.5678)	0.0189 (0.7911)
<u>HC HospComp</u>	0.1474** (0.0465)	-0.0033 (0.9643)	<u>SAT C GP</u>	-0.0419 (0.591)	0.122 (0.1108)
<u>HC Clinical Performance</u>	0.2146*** (0.0034)	-0.0784 (0.2849)	<u>SAT C Hosp</u>	-0.003 (0.9715)	0.1024 (0.2111)
<u>HC CloseHome</u>	-0.0623 (0.3848)	-0.0998 (0.1587)	<u>SAT C Doc</u>	-0.0348 (0.6909)	0.137 (0.1077)
<u>HC Familiarity</u>	-0.0078 (0.9153)	-0.0752 (0.2986)	<u>SAT C Treatment</u>	-0.0157 (0.8526)	0.0932 (0.2598)
<u>HC FinPerform</u>	0.1253** (0.0884)	0.1435** (0.0482)	<u>SAT C Time</u>	-0.0239 (0.7632)	0.0541 (0.4878)
<u>HC GP Reputation</u>	0.2020*** (0.0047)	-0.016 (0.8234)	<u>CB AWARE</u>	-0.0381 (0.5972)	0.2997*** (0)
<u>HC Access</u>	0.0451 (0.5399)	0.1196* (0.0992)	<u>CB Use</u>	0.0996 (0.1651)	0.054 (0.4477)
<u>HC PastExp</u>	0.0978 (0.182)	-0.0244 (0.7369)	<u>WEB Access</u>	0.2054*** (0.0041)	0.1197* (0.0923)
<u>SI GP Advice</u>	0.1054 (0.1457)	0.0163 (0.8202)	<u>AgeMatch</u>	0.1373* (0.0532)	0.0695 (0.3234)
<u>SI HospStat</u>	0.2937*** (0.0001)	0.1159 (0.1192)	<u>GenderMatch</u>	0.2077*** (0.0032)	0.1472** (0.0357)
<u>SI DoctorRating</u>	0.3759*** (0)	0.1240* (0.099)	<u>WhiteBritish</u>	-0.0429 (0.5477)	-0.0662 (0.3468)
<u>SI PastExp</u>	0.0563 (0.4455)	-0.0803 (0.2696)	<u>WhiteNonBritish</u>	-0.0017 (0.9809)	-0.0853 (0.2252)
<u>SI Family</u>	0.1215* (0.0958)	-0.0511 (0.4804)	<u>Income</u>	0.012 (0.8818)	-0.1219 (0.1246)
<u>Reliable</u>	0.3429*** (0)	-0.0311 (0.7153)	<u>Education</u>	-0.0103 (0.8913)	0.0023 (0.9757)
<u>DOC Listens</u>	0.0629 (0.3824)	-0.0888 (0.2122)	<u>Gender</u>	0.0315 (0.6614)	-0.0087 (0.9029)
<u>DOC Time</u>	0.1565** (0.0289)	-0.0117 (0.87)	<u>Age</u>	-0.1081 (0.1344)	-0.1918*** (0.0068)
<u>DOC Explains</u>	0.0968 (0.1784)	0.0152 (0.8314)			

P-Values in parentheses. \* p<.10, \*\* p<.05, \*\*\* p<.01

Table 3 [Odds Ratios for the Binary Logit explaining the awareness of doctor rating websites.](#)

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>
<b>Awareness</b>				
<b>Age</b>	<u>0.953*</u>	<u>0.931**</u>		
	<u>(0.0239)</u>	<u>(0.0307)</u>		
<b>Gender</b>	<u>1.347</u>	<u>1.819</u>		
	<u>(0.648)</u>	<u>(1.092)</u>		
<b>WhiteBritish</b>	<u>0.595</u>	<u>0.841</u>	<u>0.401</u>	<u>0.0150**</u>
	<u>(0.309)</u>	<u>(0.524)</u>	<u>(0.276)</u>	<u>(0.0292)</u>
<b>WhiteNonBritish</b>	<u>0.273*</u>	<u>0.398</u>	<u>0.228*</u>	<u>0.00399**</u>
	<u>(0.198)</u>	<u>(0.324)</u>	<u>(0.200)</u>	<u>(0.00957)</u>
<b>Education</b>	<u>1.105</u>	<u>1.396</u>	<u>1.279</u>	<u>1.682</u>
	<u>(0.341)</u>	<u>(0.534)</u>	<u>(0.438)</u>	<u>(1.399)</u>
<b>Income</b>	<u>0.952</u>	<u>0.943</u>	<u>0.708*</u>	<u>0.228*</u>
	<u>(0.157)</u>	<u>(0.169)</u>	<u>(0.132)</u>	<u>(0.180)</u>
<b>HC HospComp</b>		<u>1.173</u>	<u>1.353</u>	<u>2.237</u>
		<u>(0.366)</u>	<u>(0.442)</u>	<u>(1.825)</u>
<b>HC Clinical Performance</b>		<u>0.691</u>	<u>0.527</u>	<u>0.0342*</u>
		<u>(0.245)</u>	<u>(0.207)</u>	<u>(0.0609)</u>
<b>HC Familiarity</b>		<u>0.710</u>	<u>0.756</u>	<u>2.564</u>
		<u>(0.170)</u>	<u>(0.202)</u>	<u>(2.096)</u>
<b>HC GP Reputation</b>		<u>1.409</u>	<u>1.611</u>	<u>13.57*</u>
		<u>(0.509)</u>	<u>(0.599)</u>	<u>(19.95)</u>
<b>HC FinPerform</b>		<u>0.921</u>	<u>0.963</u>	<u>0.0783**</u>
		<u>(0.264)</u>	<u>(0.297)</u>	<u>(0.0919)</u>
<b>HC Access</b>		<u>1.112</u>	<u>1.088</u>	<u>0.917</u>
		<u>(0.236)</u>	<u>(0.242)</u>	<u>(0.444)</u>
<b>SI GP Advice</b>		<u>1.173</u>	<u>0.922</u>	<u>1.115</u>
		<u>(0.350)</u>	<u>(0.290)</u>	<u>(0.718)</u>
<b>SI HospStat</b>		<u>1.291</u>	<u>1.390</u>	<u>49.75**</u>
		<u>(0.410)</u>	<u>(0.477)</u>	<u>(87.28)</u>
<b>SI Family</b>		<u>0.935</u>	<u>0.614</u>	<u>0.146</u>
		<u>(0.361)</u>	<u>(0.273)</u>	<u>(0.186)</u>
<b>SI PastExp</b>		<u>0.762</u>	<u>1.202</u>	<u>0.284</u>
		<u>(0.275)</u>	<u>(0.499)</u>	<u>(0.343)</u>
<b>SI DoctorRating</b>		<u>0.938</u>	<u>0.933</u>	<u>1.859</u>
		<u>(0.261)</u>	<u>(0.271)</u>	<u>(1.119)</u>
<b>DOC Listens</b>			<u>0.416</u>	<u>1.182</u>
			<u>(0.324)</u>	<u>(2.244)</u>
<b>DOC Time</b>			<u>1.289</u>	<u>0.00185**</u>
			<u>(0.950)</u>	<u>(0.00580)</u>
<b>DOC Explains</b>			<u>2.533</u>	<u>0.885</u>
			<u>(1.799)</u>	<u>(1.658)</u>
<b>DOC Friend</b>			<u>0.752</u>	<u>15.62</u>
			<u>(0.535)</u>	<u>(30.63)</u>
<b>DOC Trust</b>			<u>0.930</u>	<u>3.173</u>
			<u>(0.583)</u>	<u>(4.555)</u>
<b>Participation</b>			<u>1.080</u>	<u>3.346</u>
			<u>(0.298)</u>	<u>(2.835)</u>
<b>AgeMatch</b>			<u>2.247</u>	<u>269.4*</u>
			<u>(1.429)</u>	<u>(791.0)</u>
<b>GenderMatch</b>			<u>3.153*</u>	<u>32.77*</u>
			<u>(1.867)</u>	<u>(61.36)</u>
<b>SAT C GP</b>				<u>3.020</u>
				<u>(2.948)</u>
<b>SAT C Hosp</b>				<u>0.802</u>
				<u>(1.134)</u>

<u>SAT C Doc</u>	<u>2.794</u>
	<u>(3.411)</u>
<u>SAT C Treatment</u>	<u>1.818</u>
	<u>(2.311)</u>
<u>SAT C Time</u>	<u>0.735</u>
	<u>(0.550)</u>
<u>Same GP</u>	<u>0.641</u>
	<u>(0.766)</u>

Exponentiated coefficients; Standard errors in parentheses

\* p<.10, \*\* p<.05, \*\*\* p<.01

For peer review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

-Table 4 Odds Ratios for the Ordered Logit explaining the likelihood to use doctor rating websites

	m1	m2	m3	m4	m5	m6
<b>AgeMatch</b>	1.974 (2.377)	2.561 (2.953)	2.000 (1.965)	2.782 (2.613)	1.051 (0.818)	0.946 (0.729)
<b>GenderMatch</b>	18.42* (30.24)	12.03* (17.75)	10.45** (12.33)	10.39** (10.54)	16.67*** (15.48)	14.83*** (13.17)
<b>Awareness</b>	0.0531 (0.108)	0.0505 (0.0971)	0.0964 (0.149)	0.0758** (0.0985)	0.159* (0.176)	0.147* (0.152)
<b>HC Clinical Performance</b>	9.289* (11.84)	7.659* (8.241)	5.560** (4.759)	3.401* (2.253)	4.395** (2.653)	4.985*** (2.734)
<b>HC Familiarity</b>	0.359 (0.287)	0.468 (0.282)	0.371* (0.220)	0.414* (0.206)	0.355** (0.147)	0.351** (0.141)
<b>HC GP Reputation</b>	2.328 (1.980)	2.827 (2.106)	3.608* (2.542)	4.410** (2.753)	2.903** (1.374)	2.776** (1.260)
<b>SI GP Advice</b>	0.170* (0.173)	0.223 (0.206)	0.238** (0.167)	0.283** (0.176)	0.344** (0.186)	0.396* (0.193)
<b>SI HospStat</b>	14.26** (18.84)	13.74** (15.60)	7.220*** (5.008)	6.550*** (4.200)	5.371*** (2.932)	5.133*** (2.703)
<b>SI DoctorRating</b>	1.596 (1.636)	1.067 (0.958)	1.424 (0.851)	1.461 (0.770)	2.245** (0.835)	2.312** (0.876)
<b>Reliable</b>	6.181 (7.691)	8.682* (9.969)	6.492** (4.993)	7.586*** (5.561)	4.457*** (2.351)	4.061*** (2.003)
<b>DOC Listens</b>	141.9* (424.8)	51.44 (126.4)	44.20* (90.99)	27.05** (41.26)	22.03** (28.29)	22.98** (28.34)
<b>DOC Explains</b>	0.00690* (0.0183)	0.00680** (0.0148)	0.00509** (0.0105)	0.00695*** (0.0124)	0.0120*** (0.0171)	0.0124*** (0.0169)
<b>DOC Friend</b>	12.88 (29.23)	8.375 (14.65)	16.48** (22.41)	19.66*** (22.45)	8.718** (8.047)	7.781** (6.896)
<b>Participation</b>	5.473* (5.255)	5.818* (5.410)	5.171** (3.664)	4.162** (2.687)	2.349* (1.126)	2.228* (1.036)
<b>SAT C GP</b>	17.03* (27.58)	8.038 (10.23)	6.593* (6.659)	5.410** (4.048)	4.692** (2.889)	4.377*** (2.484)
<b>SAT C Hosp</b>	21.93** (33.71)	22.86** (30.90)	30.01*** (33.63)	34.38*** (35.43)	17.95*** (15.52)	11.11*** (7.578)
<b>SAT C Treatment</b>	0.0515** (0.0764)	0.0561** (0.0794)	0.111** (0.106)	0.147** (0.125)	0.145** (0.111)	0.111*** (0.0788)
<b>WhiteBritish</b>	0.0137* (0.0318)	0.0409* (0.0738)	0.0542** (0.0782)	0.0539** (0.0690)	0.0909** (0.0890)	0.105** (0.0973)
<b>Income</b>	0.416* (0.190)	0.382** (0.162)	0.449** (0.154)	0.513** (0.154)	0.476*** (0.129)	0.462*** (0.120)
<b>SAT C Doc</b>	0.242 (0.468)	0.243 (0.374)	0.148* (0.161)	0.135* (0.144)	0.427 (0.321)	
<b>SI PastExp</b>	0.670 (0.787)	0.590 (0.650)	0.535 (0.576)	0.551 (0.250)		
<b>Education</b>	0.486 (0.526)	0.583 (0.554)	0.683 (0.443)	0.610 (0.328)		
<b>HC Access</b>	1.046 (0.659)	1.124 (0.678)	1.241 (0.564)	1.347 (0.565)		
<b>HC PastExp</b>	1.030 (0.578)	0.914 (0.487)	0.930 (0.397)			
<b>SI Family</b>	1.208 (1.357)	1.305 (1.484)	1.439 (1.458)			
<b>DOC Time</b>	1.223 (2.118)	2.099 (3.261)	2.594 (3.547)			

<b>DOC Trust</b>	<u>0.153</u>	<u>0.608</u>	<u>0.460</u>			
	<u>(0.327)</u>	<u>(0.983)</u>	<u>(0.629)</u>			
<b>WEB Access</b>	<u>1.122</u>	<u>0.558</u>	<u>0.483</u>			
	<u>(4.345)</u>	<u>(1.763)</u>	<u>(0.918)</u>			
<b>HC Waiting</b>	<u>0.960</u>	<u>1.097</u>				
	<u>(0.806)</u>	<u>(0.846)</u>				
<b>HC HospComp</b>	<u>1.200</u>	<u>0.790</u>				
	<u>(0.929)</u>	<u>(0.540)</u>				
<b>HC CloseHome</b>	<u>0.930</u>	<u>0.790</u>				
	<u>(0.726)</u>	<u>(0.516)</u>				
<b>HC FinPerform</b>	<u>0.610</u>	<u>0.692</u>				
	<u>(0.621)</u>	<u>(0.588)</u>				
<b>SAT C Time</b>	<u>1.449</u>	<u>1.530</u>				
	<u>(1.441)</u>	<u>(1.280)</u>				
<b>WhiteNonBritish</b>	<u>0.742</u>	<u>0.493</u>				
	<u>(1.790)</u>	<u>(1.041)</u>				
<b>CB AWARE</b>	<u>1.422</u>					
	<u>(3.158)</u>					
<b>CB Use</b>	<u>83.93</u>					
	<u>(354.7)</u>					
<b>cut1</b>	<u>9454769.9**</u>	<u>2474784.8**</u>	<u>3131224.6**</u>	<u>2460471.3***</u>	<u>10470831.2***</u>	<u>13892352.4***</u>
	<u>(63313549.3)</u>	<u>(15197453.2)</u>	<u>(18256829.6)</u>	<u>(13260544.4)</u>	<u>(45550085.5)</u>	<u>(59299449.7)</u>
<b>cut2</b>	<u>7.05660e+09*</u>	<u>1.22556e+09***</u>	<u>1.14387e+09***</u>	<u>674102348.3***</u>	<u>1.42570e+09***</u>	<u>1.60379e+09***</u>
	<u>**</u>					
	<u>(5.66892e+10)</u>	<u>(8.86204e+09)</u>	<u>(7.69789e+09)</u>	<u>(4.20283e+09)</u>	<u>(7.17551e+09)</u>	<u>(7.78799e+09)</u>

# QUESTIONNAIRE

## Imperial College Business School



We would be very grateful for your cooperation in completing this questionnaire. It should take around **10 minutes** to complete.

The data collected will contribute towards a study into the healthcare service in the UK. There are currently major changes taking place in the NHS, in an effort to improve the choice and quality of services available to the public. One of these changes has been the introduction of a system called "Choose & Book" which gives you the option to choose which hospital you wish to go to for your outpatient appointment, following a GP referral. This is a study into how individuals regard these new choices and how they make decisions about where to receive care. In particular, we are studying the awareness and use of online doctor rating websites as a source of information for patients. These doctor rating websites allow patients to rate their doctors and provide feedback based on their own experiences. The ratings can then be used by others when deciding where to receive health care.

All data collected will remain strictly confidential. The study is being conducted by researchers from Imperial College London and King's College London. If you would like to be informed of the results of this study, please contact [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk).

**SECTION A**

[www.iwantgreatcare.com](http://www.iwantgreatcare.com)

[www.NHSchoices.co.uk](http://www.NHSchoices.co.uk)

[www.patientopinion.co.uk](http://www.patientopinion.co.uk)

[www.privatehealth.co.uk](http://www.privatehealth.co.uk)

**Q1. Are you aware of any of the above online doctor rating websites or any other doctor rating websites?**

Yes \_\_\_\_\_ No  (if No, skip ahead to Section C)

Other (please specify).....

**Q2. How did you find out about these sites?**

Family/Friends \_\_\_\_\_  Doctor

The Media \_\_\_\_\_  Other (please specify).....

**SECTION B**

**Q3. Have you used these websites in the past to look at doctor/hospital ratings?**

Yes  \_\_\_\_\_ No  (if No, skip ahead to Section C)

**Q4. What specialty of doctor have you searched for in the past in these websites?**

.....

**Q5. When do you use these websites?**

On a regular basis  \_\_\_\_\_ Only before/after an appointment  Rarely

**Q6. In the past, has the information on these websites influenced your choice of doctor/hospital?**

Yes  \_\_\_\_\_ No

**Q7. If Yes, was this based on positive or negative information on the websites?**

Positive information  \_\_\_\_\_ Negative information

**Q8. How easy to use do you find the sites? Please circle the most appropriate number on a scale of 1 to 5 (1=very easy, 5=very difficult)**

1    2    3    4    5



## SECTION C

**Q9. Which of the following factors are important to you in making decisions about where to receive healthcare?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important), or 'none of these'.

Waiting lists	1	2	3	4	5
Rates of hospital-acquired complications	1	2	3	4	5
Clinical performance rating	1	2	3	4	5
Closeness to home	1	2	3	4	5
Familiarity with the doctor	1	2	3	4	5
Financial performance of the hospital	1	2	3	4	5
Reputation of the doctor	1	2	3	4	5
Accessibility and parking facilities	1	2	3	4	5
Past experience with the provider	1	2	3	4	5
None of these	<input type="checkbox"/>				

**Q10. Which of the following sources of information are important in making decisions about where to receive health care?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important).

GP advice	1	2	3	4	5
Published hospital statistics	1	2	3	4	5
Online doctor rating website	1	2	3	4	5
Personal experiences in the past	1	2	3	4	5
Feedback from family/friends	1	2	3	4	5

**Q11. To what extent do you think that the online rating of doctors by patients is a reliable measure of a doctor's performance?** Please circle the most appropriate number on a scale of 1 to 5 (1=very unreliable, 5=very reliable)

1      2      3      4      5      Not sure     

**Q12. If you have not used these websites before, how likely do you feel you will use them in the future?**

Not likely       Quite likely       Likely

## **SECTION D**

**Q13. These websites are based on patient input. Individuals can provide feedback based on their own experiences. Considering this, when would you be most likely to contribute to the online site?** Tick all that apply.

- Every time
- After particularly positive experiences only
- After particularly negative experiences only
- After both positive and negative experiences
- Never
- Not sure

**Q14. Out of the following what would be your motive for any contributions that you make to an online doctor rating site?** Tick all that apply.

- I would not contribute to these websites
- To inform other patients
- To improve standards of care in the NHS
- As a method of complaint
- In appreciation of a doctor's service
- Not sure

## **SECTION E**

**Q15. Which of the following attributes would you use to describe your GP?** Tick all that apply.

- I feel my doctor listens to my problems
- I feel my doctor spends enough time with me in each consultation
- I feel my doctor explains things clearly
- I feel my doctor is sociable and friendly

- [I feel that I can trust my doctor's opinions](#)
- [None of the above](#)

**Q16. How actively do you participate with your GP in making decisions about your health care generally? Tick the single most appropriate.**

- [My doctor always makes decisions for me](#)
- [I like to know the options available but still let my doctor decide for me](#)
- [My doctor and I make the decisions together](#)
- [I make decisions for myself, after considering the advice of my GP](#)
- [I always make my own decisions, independently of the advice of my GP](#)
- [I make decisions with my parents/spouse/relatives](#)

**Q17. Within your GP practice do you always want to see the same GP for an appointment?**

- [I always request to see the same GP](#)
- [I don't mind which doctor I see.](#)

**Q18. Where is choice more important to you in the NHS? Please circle the most appropriate number on a scale of 1 to 5 (1 = of no importance, 5 = very important) or select 'not sure'.**

Choice of GP                                      1                      2                      3                      4                      5                      Not sure     

Choice of hospital for                      1                      2                      3                      4                      5                      Not sure     

\_\_\_\_\_ [outpatient appointment](#)

Choice of doctor for                                      1                      2                      3                      4                      5                      Not sure     

\_\_\_\_\_ [outpatient appointment](#)

Choice of treatment                                      1                      2                      3                      4                      5                      Not sure     

Choice of appointment time                      1                      2                      3                      4                      5                      Not sure     

[\(for primary & secondary care\)](#)

\_\_\_\_\_

**Q19. How satisfied are you with the current level of choice of where you can receive health care within the NHS? Please circle the most appropriate number on a scale of 1 to 5 (1 = strongly dissatisfied, 5 = strongly satisfied) or select 'not sure'.**

Choice of GP                                      1                      2                      3                      4                      5                      Not sure     

Choice of hospital for                      1                      2                      3                      4                      5                      Not sure     

\_\_\_\_\_ [outpatient appointment](#)



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Yes \_\_\_\_\_  No \_\_\_\_\_

**Q26. If you do not use online doctor rating websites, which of the following factors stops you from doing so? Tick all that apply \_\_\_\_\_**

- I'm too busy to have the time to use them
- The sites are not a reliable source of information
- It is difficult to interpret the information provided
- I already have enough information from other sources to make choices
- I don't have access to the internet
- I did not know these websites existed
- I have never needed to use these websites

**Q27. What other internet websites involving ratings do you use? Tick all that apply. \_\_\_\_\_**

- Shopping websites \_\_\_\_\_ (e.g. Amazon)
- Holiday websites \_\_\_\_\_ (e.g. TripAdvisor)
- Car insurance websites \_\_\_\_\_ (e.g. Compare The Market)
- Restaurants/venue websites (e.g. ViewLondon)
- Film websites \_\_\_\_\_ (e.g. Rottentomatoes)
- Other \_\_\_\_\_ (please specify).....
- I don't use any rating websites.

**Q28. What methods of rating do you feel are a useful form of feedback in these websites? Tick all that apply.**

- Star-rating out of 5
- Percentage scores
- Thumbs Up/Down
- Written comments from patients/users
- No preference

---

## **SECTION G**

We remind you that all personal data collected will remain confidential and is collected for academic purposes.

**Q29. What is your age? .....**

**Q30. What is your gender?**

Male \_\_\_\_\_  Female \_\_\_\_\_

**Q31. How would you describe your ethnicity?**

<a href="#">White – British</a>	<a href="#">Other Asian – non-Chinese</a>
<a href="#">White – Others</a>	<a href="#">Black Caribbean</a>

<a href="#">Mixed race</a>	<a href="#">Black African</a>
<a href="#">Indian</a>	<a href="#">Black – Others</a>
<a href="#">Pakistani</a>	<a href="#">Chinese</a>
<a href="#">Bangladeshi</a>	<a href="#">Other</a>

**Q32. What is your postcode? .....**

**Q33. How many other individuals do you live with? .....**

**Q34. Do you live with your parents?**

Yes  No

**Q35. What is/was your profession? .....**

Unemployed  Retired

**Q36. What is your level of pre-tax income?**

0  
 <£15000 but >0  £15,000-£35,000  
 £35,000-55,000  £55,000-£75,000  
 £75,000-£95,000  >£95,000

**Q37. What is your highest level of educational attainment?**

<a href="#">GCSE</a>	<a href="#">Other vocational degree</a>
<a href="#">A-Level</a>	<a href="#">University degree</a>
<a href="#">BTEC</a>	<a href="#">Postgraduate degree</a>

**Q38. In the last year how many times have you had an outpatient hospital appointment?**

0 times  1-3 times  
 4-5 times  More than 5 times

**Q39. What is the sex of your GP?**

Male  Female

**Q40. How old is your GP?**

<30 years  
 30-50 years  
 >50 years

**Q41. What is the ethnicity of your GP?**

<a href="#">White – British</a>	<a href="#">Other Asian – non-Chinese</a>
<a href="#">White – Others</a>	<a href="#">Black Caribbean</a>

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

<a href="#">Mixed race</a>	<a href="#">Black African</a>
<a href="#">Indian</a>	<a href="#">Black – Others</a>
<a href="#">Pakistani</a>	<a href="#">Chinese</a>
<a href="#">Bangladeshi</a>	<a href="#">Other</a>

[Q42. I cannot answer Q39, Q40, Q41 because I don't always see the same GP.](#)

[This is the end of the questionnaire, thank you for your time.](#)

For peer review only

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1-2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2- 3
<b>Introduction</b>			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	8
		(b) Describe any methods used to examine subgroups and interactions	8
		(c) Explain how missing data were addressed	8
		(d) If applicable, describe analytical methods taking account of sampling strategy	NA
		(e) Describe any sensitivity analyses	NA
<b>Results</b>			



Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	8-11
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	18-23
		(b) Report category boundaries when continuous variables were categorized	NA
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	11-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	11
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	12

\*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).



**Who is More Likely to Use Doctor-Rating Websites, and Why?**  
**A cross sectional study in London.**

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2012-001493.R2
Article Type:	Research
Date Submitted by the Author:	12-Sep-2012
Complete List of Authors:	Galizzi, Matteo; London School of Economics, LSE Health Miraldo, Marisa; Imperial College London, Business School Stavropoulou, Charitini; University of Surrey, Health Care Management Desai, Mihir; Imperial College London, Medicine Jayatunga, Jeevana; Imperial College London, Medicine Joshi, Mitesh; Imperial College London, Medicine Parikh, Sunny; King's College London, Medicine
<b>Primary Subject Heading</b>:	Health economics
Secondary Subject Heading:	Health policy
Keywords:	HEALTH ECONOMICS, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, World Wide Web technology < BIOTECHNOLOGY & BIOINFORMATICS

SCHOLARONE™  
 Manuscripts

Only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stavropoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

**Declaration:** All authors have completed the Unified Competing Interest form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

**Copyright statement:** The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, a worldwide licence to the Publishers and its licensees in perpetuity, in all forms, formats and media (whether known now or created in the future), to i) publish, reproduce, distribute, display and store the Contribution, ii) translate the Contribution into other languages, create adaptations, reprints, include within collections and create summaries, extracts and/or, abstracts of the Contribution, iii) create any other derivative work(s) based on the Contribution, iv) to exploit all subsidiary rights in the Contribution, v) the inclusion of electronic links from the Contribution to third party material where-ever it may be located; and, vi) licence any third party to do any or all of the above.

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stavropoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

### Article summary

#### Article focus:

- To explore the awareness of the existence of doctor-rating and its usage among the general population.
- To understand the main predictors of what makes people willing to use doctor-ratings websites.

#### Key messages:

- The share of the general public which uses doctor-rating websites is still quite low.
- Elderly, subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The doctor-patient relationship is a significant predictor of patients' intention to use, doctor-rating websites.

#### Strength and Limitations:

- Our study contributes to the literature of online health information where evidence on the determinants of people's willingness to use doctor-rating websites is limited.
- The main limitation of the study is that we use a convenience sample from one borough of London, UK and therefore results cannot be immediately generalised to the UK population.

### Abstract

**Objectives:** To explore the extent at which doctor-rating websites are known and used among the general population. To understand the main predictors of what makes people willing to use doctor-ratings websites.

**Design:** A cross-sectional study.

**Setting:** The Borough of Hammersmith and Fulham, London, England.

**Participants:** 200 individuals from the borough.

**Main outcome measures:** The likelihood of being aware of doctor-rating websites and the intention to use doctor-rating websites.

**Results:** The use and awareness of doctor-rating websites is still quite limited. Elderly, white British subjects, as well as respondents with higher income are less likely to use doctor-rating websites. The doctor-patient relationship also plays a key role in explaining intention to use the websites: the GP-patient gender concordance is associated with higher intention to use, the websites. Respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

**Conclusions:** Online rating websites can play a major role in supporting patients' informed decisions on which health care providers to seek advice from, thus potentially fostering patients' choice in health care. Subjects who seek and provide feedback on doctor-ranking websites, though, are unlikely to be representative of the overall patients'

pool. In particular, they tend to over-represent opinions from young, non white British, medium-low income patients who are not satisfied with their choice of the healthcare treatments and the level of information provided by their GP. Accounting for differences in the users' characteristics is important when interpreting results from doctor-rating sites.

### Key messages

- The share of the general public which uses doctor-rating websites is still quite low.
- Elderly, subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The GP-patient gender concordance is associated with higher intention to use, the websites.
- Subjects who feel that their GP explains things clearly and is a valuable source of clear information, are less likely to use online rating websites.
- Subjects who feel that they are more satisfied with the level of choice of healthcare treatments are less likely to use online rating websites.

<sup>1</sup> London School of Economics, LSE Health and Centre for the Study of Incentives in Health

<sup>2</sup> Imperial College Business School

<sup>3</sup> University of Surrey

<sup>4</sup> Imperial College School of Medicine

<sup>5</sup> King's College London

\*Corresponding author: Marisa Miraldo. Email: [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk)

## INTRODUCTION

In recent years, both the NHS Plan<sup>1</sup> and the NHS Improvement Plan<sup>2</sup>, set out the changes required for the English NHS to become more patient-focussed. Greater patient involvement in the running of the NHS has gone hand in hand with the policymakers' drive to improve the quality of public healthcare services. The 'bottom-up' approach to a more patient-centred NHS has typically focused on three main areas: i) giving users more choice and personalisation; ii) making funding respond to users' choices; and iii) engaging users through greater involvement.<sup>3</sup> Lord Darzi's 2008 report "High Quality Care For All - The Next Stage Review"<sup>4</sup> acknowledged that improvements to the NHS should focus on improving the quality of services, and that the best way of achieving this would be to ensure that services are locally responsive to the needs of the community, for instance, by empowering providers and patients as decentralised decision-makers in order to foster a culture of continuous quality improvement and innovation.

Websites, such as the *NHS Choices* and *Dr Foster Intelligence*, have been developed with the explicit aim of informing patients about the services that the NHS provides and therefore allowing a better choice of physicians and treatments. In principle, doctor-rating websites can have a profound impact on public involvement and patients' choice, as they enable patients to make more informed decisions on where to seek healthcare, and thus to engage more often in active choices concerning their health. In practice, however, relative little evidence is available on whether, and to what extent, doctor-rating websites are actually known and actively used in the UK.

A study by the Kings Fund<sup>5</sup> explored the information sources used by patients in making decisions about where to receive care. Only 4% of the patients used the NHS Choices website, with the majority instead drawing information from their own experiences (41%), and advice from GP (36%). Similarly, a national survey on patients' choice by the Department of Health found that the NHS Choices website was only used by 5% of respondents.<sup>6</sup> These figures are consistent with the evidence from the US where usage of doctor rating websites is still quite low.<sup>7,8</sup> Moreover, very little is known about the profile of individuals who are more likely to make active use of these sites. Appleby and Alvarez<sup>9</sup> found that women in England desire patient choice more than men (69% to 56%), suggesting that women may also be more likely to use patient sources of information such as rating sites. This is in line with findings from the US where women and younger adults are more active 'online health information seekers'.<sup>10</sup>

The aim of this study is to contribute to fill these gaps by providing more direct evidence on, first, the extent to which doctor ratings websites are known and used among the general public in a borough of London; and, second, the most significant predictors of the fact that people are willing to use doctor-ratings websites.

## METHODS

We conducted a self-administered survey to assess the extent and the determinants of i) the awareness of the existence of doctor-ratings websites; ii) the level of actual usage of those websites; iii) the intention to use doctor-ratings websites in the future.

### Questionnaire design

Prior to the data collection a pilot study was conducted. The aim of the pilot was to gain an understanding of the practicalities associated with giving out questionnaires and collecting responses. After listening to feedback from pilot respondents, and looking at results from the pilot study, several changes were made to make the questionnaire easier to understand. The changes related to content, phrasing and ordering of questions.

The content of the final questionnaire was based on findings from the preliminary literature review and was designed to have a number of sections (see Appendix for full questionnaire). In particular, section A focuses on the awareness of online rating websites, while section B assesses actual usage of online rating websites. Section C measures the willingness to use the online rating websites in the future, and explores which aspects of the healthcare providers and which sources of information are perceived as being important factors in making decisions about where to receive healthcare. Section D assesses the individual contribution to the online rating sites, while section E focuses on aspects of the doctor-patient relationship and attitudes and dimensions of patient choice. Finally section F controls for internet usage, while section G collects a broad range of socio-demographic characteristics.

Closed questions were used, worded in a manner easy to understand. A limited number of responses were provided, either with binary options (e.g. yes or no), or with a numerical Likert scale ranging from 1 to 5, with a further option for “*Not sure*”.

A list of variables with a brief description is discussed in the Variables section and is summarised in Table 1 in the Appendix.

### **Ethical approval, informed consent and confidentiality of responses**

We completed the checklist for research ethics approval from Imperial College London. As interviews were intended to be conducted in public places among respondents from the general population, the study involved no risk or harm of any type to respondents, no link with clinical data was expected to take place, and no incentives were going to be paid to respondents, the study fitted all the criteria in the first stage checklist with no further formal application to the Imperial College Research Ethics Committee.

At the beginning of each interview, interviewers showed credentials as research assistants at the University of London, informed respondents that their answers were anonymous and would remain strictly confidential, and that all responses and data were going to be treated statistically and used for the purposes of scientific research only. Informed consent by respondents was then given at the beginning of each interview.

### **Sample**

The survey was conducted in the field by the researchers involved in the paper. The borough of Hammersmith and Fulham was chosen for the location of the field survey because it is a transport hub in Central West London, and hosts many offices and several major business centres. The four interviewers went to different public locations within the borough (underground stations, high street and residential areas) at different times during the day (early morning, midday and in the evening) and in different days of the week (including weekends). By covering different times and locations within the borough, we aimed at being able to approach both working and non-working members of the public.

1  
2  
3 During the surveys in the field, the interviewers approached every third male and third  
4 female that would pass by them.  
5

6 Sample size calculations were based on the intended objective to look at the correlation  
7 coefficient between the likelihood of using the websites on the one hand, and a typical  
8 survey response, on the other. The minimum sample size to test the null hypothesis of no  
9 significant correlation between these two variables was calculated given the most  
10 conservative assumption that the correlation coefficient between the variables in the  
11 population was in the region of 0.2 (a “low” effect size, the variance of one variables  
12 accounting for just 4% of the variance of the other). Under the assumptions that all  
13 variables are normally distributed, a bi-directional test (both positive and negative  
14 correlation were expected) with 95% significance level reaches a standard 80% power  
15 level at a minimum sample of n=200 subjects.<sup>11</sup> We thus targeted a sample size of 200  
16 respondents. The envisaged target was then readily achieved, since only 68 subjects who  
17 were initially approached refused to take part to the survey, with a final response rate of  
18 74%.  
19  
20  
21  
22  
23  
24

### 25 **Statistical analysis**

26  
27 We have carried a multiple regression analysis which aims to explore the determinants of  
28 i) being either aware or not of doctor rating websites; and ii) the individual intention of  
29 using these websites in the future.  
30

31 The dependent variable in the first case is modeled as a binary variable (*Awareness*)  
32 taking values 1 or 0 for the respondents who reported to be aware or unaware of the  
33 websites, respectively. The second dependent variable is instead modeled as a discrete  
34 ordered variable (*IntentionToUse*) taking values 1, 2, and 3 for subjects reporting to be  
35 ‘not likely’, ‘quite likely’, and ‘likely’ to use the websites in the future, respectively.  
36  
37

38 The explanatory variables ( $X_i$ ) include the variables described in Table 1, namely:  
39 individual socio-demographic characteristics; a set of variables on the characteristics of  
40 the healthcare providers that the respondents consider important for making their  
41 decisions on where to receive health care; a set of variables on the sources of information  
42 that are important in making decisions about where to receive health care; two dummy  
43 variables that capture whether the patient’s gender and age are the same, or within a  
44 comparable range, respectively, than the gender and age of her GP; a set of variables that  
45 describe the respondents’ feelings about their relation with their doctor; a variable  
46 indicating the level of participation of the respondents in their GPs’ decisions; a set of  
47 variables on patients’ satisfaction with the level of choice in their healthcare decisions; a  
48 dummy variable controlling for whether the subjects had access to internet at home or at  
49 work; a variable on awareness of the existence of doctor-rating websites; and a variable on  
50 whether the subject always asks to see the same GP (see Table 1 for variables’ details).  
51 The choice of the explanatory variables was further informed by the bivariate correlation  
52 analysis reported in Table 2 in the Appendix.  
53  
54  
55

56 We employed a binary logistic and an ordered logistic model to fit the *Awareness* and the  
57 *IntentionToUse* discrete variables, respectively, to ensure a reasonable comparability  
58 between the empirical results obtained for the two set of regressions. The two models, in  
59  
60



fact, only differ in the number of values that the dependent variables can take, while the underlying structure of the error terms follows the same standardized logistic distribution. The logistic specification is particularly appealing because its results can be readily expressed in terms of odds ratio. We have, however, conducted a robustness check by replicating the multiple regression analysis using the alternative binary and ordered probit specifications, which assume a Gaussian error term and present results in terms of estimated coefficients instead of odds ratio. The two set of regressions provide consistent estimates and results which are qualitatively fully aligned. Results of the probit specifications are available, upon request, from the authors.

All the regression analysis has been conducted using STATA v.11.

## RESULTS

### Descriptive statistics

Descriptive statistics of all the dependent and independent variables for the resulting sample of respondents to our survey are provided in detail in Table 1, and here we briefly report their main aspects. As a result of the convenience sampling, our resulting sample consisted in 141 workers (ten of which reported to be currently unemployed), 33 students, nine officially unemployed and six retired subjects. Eleven respondents did not report their working status.

The mean age of our sample was of 39.57. The range of ages seems to show a positive skew, with a greater frequency of people aged 40 years and under. Age is an important demographic to consider when analysing our results as age has been shown to be important in internet usage.<sup>10</sup> From the sample, 54.44% were female, 48.79% of 'White British' ethnicity and 28.99% non white respondents.

The majority of actively working respondents reported an income within the £15-35,000 bracket. Income is an important variable to control for in the analysis, as previous literature found that patients using the Internet were more educated and had higher incomes.<sup>12</sup>

Our sample had a high percentage of people with higher level qualifications: 46.24% of the sample had a university degree and 27.96% had a postgraduate degree.

### Results on awareness

Only 29 of our respondents were aware of the doctor-rating websites they were asked about.

In Table 2 we present the set of bivariate correlations between the fact of being aware of the websites and each of the variables collected in the survey. As it can be seen, there is positive correlation between having an internet access, or being aware of the NHS Choose and Book system, and being aware of the doctor rating websites. Age exhibits a negative correlation, while the gender concordance with the GP, shows a positive correlation. Positive correlations with the awareness of doctor rating websites also hold for respondents who think that those websites are important sources of information, or who

1  
2  
3 see accessibility and financial performances of hospitals important factors in making  
4 decisions where to seek healthcare.  
5

6 [Table 2 in here]  
7  
8  
9

10 In Table 3 we present the estimate results of four different specifications of the binary  
11 logistic regression for the dependent variable *Awareness* with different sets of regressors,  
12 which are presented in terms of the odds ratio, together with the standard errors, and levels  
13 of significance.  
14

15  
16  
17  
18 [Table 3 in here]  
19

20 Among the demographic factors, age and ethnicity are the only significant variables. Older  
21 individuals are less likely to be aware of the rating websites, which does not constitute a  
22 surprise, as they are usually less familiar with the use of internet in general. Moreover, in  
23 most specifications, white British and white non-British respondents appear less likely to  
24 be aware of the websites.  
25

26  
27 Among the broader socio-demographic factors, only income is sometimes (marginally)  
28 significant, pointing to the fact that respondents with higher reported levels of income tend  
29 to be less aware of the websites, while neither education or gender turn out to be  
30 significant predictors of awareness.  
31

32 Looking at the characteristics of the providers that respondents consider important in  
33 making their decisions on where to receive healthcare, in one specification the reputation  
34 of the doctor has a strong positive effect, while both clinical and financial performance  
35 rates of the providers show negative significant effects. Thus, the respondents who  
36 consider the reputation of the doctor important in deciding where to receive care are more  
37 likely to be aware of the rating websites, while this is less often the case for respondents  
38 putting a higher weight on financial or clinical performance ratings.  
39

40  
41 Concerning the sources of information, in one specification respondents who consider the  
42 hospital statistics important in deciding where to receive care, turn out to be more likely of  
43 being aware of the rating websites, with an effect which is particularly significant and  
44 quite remarkable in terms of odds ratio.  
45

46 Furthermore, although in one specification the respondents who feel that their GPs spend a  
47 sufficient time in their consultation are less likely to be aware of the internet rating  
48 websites, both the statistical significance and the estimated odds ratio do not appear robust  
49 across specifications. Although all other variables on doctor-patient relationship were not  
50 significant, whenever included among the regressors, the gender match between the GP  
51 and the patient predicts higher awareness of the website ratings, with a noticeable effect as  
52 evident by the reported value of the odds ratio.  
53

54  
55 From those that were aware of the existence of doctor-rating websites only 6 have  
56 reported to have used these websites. In light of this low usage rate, and of the consequent  
57 limitations of conducting statistical estimations with very little variation in the dependent  
58  
59  
60

1  
2  
3 outcomes, we have thus focused the rest of the analysis on the determinants of the  
4 intention to use, rather than actual usage of, doctor rating websites.  
5  
6  
7

### 8 **Results on the likelihood to use online rating websites**

9  
10 In Table 2 we present the set of bivariate correlations between the intention to use the  
11 doctor rating websites and each of the variables collected in the survey. As it can be  
12 noticed, there is a positive correlation between having internet access, and being aware of  
13 the doctor rating websites. Both the age and the gender concordance with the GP show a  
14 positive correlation with the intention to use. Positive correlations with the willingness to  
15 use doctor rating websites also hold for respondents who think that those websites, or  
16 hospital statistics, are important sources of information. Also the fact that respondents  
17 believe that online rating is a reliable measure is clearly correlated with the intention to  
18 use them. Finally, positive correlations also hold for respondents who feel that their doctor  
19 has time to dedicate to them, or who see several aspects of healthcare providers - such as  
20 reputation, clinical and financial performances, waiting lists, accessibility – as important  
21 factors when making decisions where to seek healthcare.  
22  
23

24 In Table 4 we present the estimate results of six different specifications of the ordered  
25 logistic regression for the dependent variable *IntentionToUse* with different sets of  
26 regressors, which are presented in terms of the odds ratio, together with the standard  
27 errors, and levels of significance.  
28

29 **[Table 4 in here]**  
30

31 Concerning socio-demographic variables, it turns out that white British, as well as  
32 respondents who reported income in higher brackets, said they were less likely to use  
33 doctor-rating websites. Moreover, we do not find any effect of education, age and gender  
34 of the respondents on the likelihood of their intention to use (the results of the  
35 specifications including the age and gender variables are not reported in the table for the  
36 sake of space but are available from the authors upon request).  
37  
38

39 Looking at the characteristics of the healthcare providers that respondents perceived as  
40 important while making decisions where to receive healthcare, our data suggest that those  
41 who consider clinical performance and doctor reputation (in most specifications) as  
42 important factors, are more likely to use doctor-rating websites. These results are  
43 consistent with the nature of the information provided in these websites. Also, and quite  
44 intuitively, subjects who consider the familiarity with their doctor an important factor to  
45 decide where to seek healthcare, tend to be less likely to intend to use websites.  
46  
47

48 Concerning the role of the different sources of information on the decisions of where to  
49 seek healthcare, respondents who see published hospital statistics as important sources of  
50 information are more likely to use the rating websites. On the other hand, and  
51 interestingly, those for whom GP advice is an important source of information for decision  
52 making are less likely to use doctor-rating websites.  
53  
54

55 Also the nature of the doctor-patient relationship seems to play a key role in explaining  
56 whether respondents intend to use online rating websites. First, patients with GPs of the  
57 same gender tend to be more likely to use the websites. Second, respondents for whom the  
58 doctor is able to listen to them, and who perceive the nature of the relationship with their  
59  
60

GP as friendly, also tend to be more likely to use the websites. Third, respondents who feel that their doctor explains things clearly are less likely to use online rating websites. Fourth, it also transpires that the more autonomy patients have in their healthcare decisions, the more likely they are to be willing to use the rating websites.

Finally, concerning, the interaction between levels of satisfaction for the healthcare services within the NHS, and the intention to use doctor-rating websites, it is interesting to note that those that have reported to be more satisfied with the level of choice of GP, and with the amount of choice of the hospital to receive outpatient appointments, are more likely to use these websites. On the other hand, the respondents that are more satisfied with the level of choice of treatments are less likely to use the websites.

## DISCUSSION

In this section we briefly discuss our main findings on i) the representativeness of our sample; ii) the level of awareness and usage of doctor rating websites; and iii) the determinants of the intention to use them in the future.

### The sample

As common in field surveys of this type, the convenience sampling tended to over-represent respondents who were currently not working, or were at home, and thus had time to fill out the questionnaire: the proportion of subjects who were not currently working, as given by the sum of the respondents who reported to be unemployed, retired, or students, indeed amounts to 29% of the sample.

Related to that, it turned out that 9.5% of the respondents in our sample were currently unemployed compared to only 5% from the Census data for the borough.

The relatively higher proportion of unemployed respondents may also be a result of the convenience sampling method. Moreover, an unemployment rate higher than the one documented in the 2001 Census survey was largely expected, due to the consequences of the economic and financial crisis after 2007.

Comparing the sample with the Census data for the borough the mean age of our sample was slightly older than that for the borough (39.57 years compared to 35.2 years).<sup>13</sup> Our sample however was closer to the national mean age of 38.5 years. The range of ages seems to show a positive skew, with a greater frequency of people aged 40 years and under. This is consistent with the 2001 census data for Hammersmith and Fulham which showed the borough contained a larger proportion of young people aged 20-29 (23.8%) than the rest of England (12.66%) (ONS, 2001).<sup>13</sup>

Also, the sample had a slightly greater proportion of females than the borough (54.44% to 52% respectively), and a lower proportion of 'White British' ethnicity (48.79% compared to 58% for the borough).<sup>13</sup> This is also significantly lower than figures for England, White British accounting for 87% of the population.<sup>13</sup> The sample contained 28.99% non white respondents. This is higher than the 2001 census data for Hammersmith and Fulham which was 22% and significantly higher than the figures for England, showing non white

1  
2  
3 ethnic groups accounting for 9% of the total population.<sup>13</sup> Our sample, therefore, allows  
4 controlling for high heterogeneity in ethnic background even with a limited sample size.  
5

6 Our sample had a high percentage of people with higher level qualifications: 46.24% of  
7 the sample had a university degree and 27.96% had a postgraduate degree. This is  
8 reflective of Hammersmith and Fulham, where 45% of the population have a qualification  
9 of degree level or higher, a figure which is significantly higher than in England, where  
10 only 19.8% have a degree or higher qualification.<sup>13</sup>  
11

### 14 **Awareness and actual usage**

15 Only 15% of our sample were aware of the existence of these websites, indicating that the  
16 awareness and, consequently, usage of these online sources is still quite limited in the UK,  
17 although significantly higher than what the previous studies have shown.<sup>5</sup>  
18

19 A slow uptake of online ratings has also been reported in the US, a more market-oriented  
20 health system. It is indicative that only 6% of Americans were aware of Hospital  
21 Compare, the quality reporting website maintained by the Centres for Medicare and  
22 Medicaid Services (CMS).<sup>14</sup>  
23

24 Concerning the low reported rate of active usage of doctor rating websites, the finding is  
25 not too surprising given that the survey was done among the general population: the  
26 reason why many more respondents were aware of the online ratings than did actually use  
27 it may simply be because those subjects did not actually need to see a doctor. Generally  
28 speaking, the finding is consistent with previously reported levels of usage in the UK. In  
29 particular, a study by the Kings Fund<sup>5</sup> that explored the information sources used by  
30 patients in making decisions about where to receive care, found that only 4% of the  
31 patients used the *NHS Choices* website, with the majority instead drawing information  
32 from their own experiences (41%), advice from GP (36%), advice from friends and family  
33 (18%), and other websites (1%). Similarly, a national survey on patients' choice by the  
34 Department of Health found that the *NHS Choices* website was only used by 5% of  
35 respondents.<sup>6</sup>  
36  
37  
38

39 The proportion of active users in our survey is also consistent with evidence from the US  
40 on the limited usage of doctor rating websites. Gao et al.<sup>8</sup> analysed 386,000 national  
41 ratings from 2005-2010 in the US and showed that only 1 out of 6 physicians among those  
42 included in the study had received some rating. Lagu, Hannon, Rothberg et al.<sup>7</sup> also  
43 reported a low average number of ratings per physician.  
44

### 46 **Intention to use**

47  
48 The results that show that white British and respondents who reported income in higher  
49 brackets said that they were less likely to use doctor-rating websites, is partly in contrast  
50 to what found by the previous literature<sup>12,15,16</sup> and can signal that white British subjects  
51 and respondents with higher self-reported income may feel less in need of checking online  
52 doctor ratings, perhaps because they may also have private, or employer-paid, health  
53 insurance schemes, or because they are in the position of directly accessing alternative  
54 sources of information through their networks of acquaintances. Another possible  
55 explanation may be that white British individuals may trust less information that exists  
56 online and they have more concerns about confidentiality issues as shown in a study  
57 among different socio-economic groups in the US by Brodie et al.<sup>17</sup> As the estimated  
58  
59  
60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

effect of these variables appear to be robust across all empirical specifications, these findings seem to suggest that online doctor-rating websites are likely to be particularly attractive to subjects with non-white British ethnicity and less favoured economic background.

On the other hand, the lack of statistical significance in the ordered logit estimates, seems to suggest that while age can be a significant factor in explaining the awareness of Internet for health information, it is not significantly explaining the intention to use doctor-rating websites once subjects are made aware of their existence. The analogous lack of significance for the respondents' gender, on the other hand, does not support the view that women in the UK may be more likely to use patient sources of information and rating websites, although they have been found to desire patient choice more than men (69% to 56%).<sup>9</sup> Both results differ from the findings from the literature. The literature has shown that socio-demographic characteristics are major determinants of usage of online health information. In particular women and younger adults are more active 'online health information seekers'.<sup>10,18-21</sup>

Education has also been found to determine usage of online and offline health information. Cotton and Gupta<sup>16</sup> and Diaz et al,<sup>12</sup> carried out research into the characteristics of online and offline health information seekers and showed that individuals who are less educated were shown to be less likely to be users of online health information.

Therefore even though, according to our findings, intentions to use do not differ across different socio demographic groups, actual usage may be greatly determined by access rather than intentions to use, with the former substantially differing according to socio-economic and demographic characteristics. That is, there may exist income- or age-related barriers to actual access that prevent individuals from using doctor rating sites even though their intentions to use them are similar.

From the perspective of the doctor-patient relationship, the finding that patients with GPs of the same gender tend to be more likely to use the websites is of particular interest, and it is consistent with the analogous effect found for the likelihood of being aware of those websites. Considered together these findings point to the possible explanation that the doctor and the Internet may sometimes be seen by patients as "complementary", rather than alternative, information channels.<sup>15</sup> This interpretation is further confirmed by the finding that respondents for whom the doctor is able to listen to them, and who perceive the nature of the relationship with their GP as friendly, also tend to be more likely to use the websites.

The doctor-patient gender concordance, in fact, has often been reported in the literature as a factor associated with higher patient satisfaction with the consultation as well as better outcomes.<sup>22</sup> If we interpret the gender match variable as an indication of satisfaction with the consultation, our finding indicates that being aware of and the intention to use the doctor-rating websites is not necessarily the result of a poor consultation. Instead, the Internet and the doctor are likely to be seen as complementary, rather than alternative, information channels.

Nevertheless for those that put a higher weight on financial or clinical performance ratings this is less the case, perhaps signalling that those respondents may be more familiar with alternative sources of information.

1  
2  
3  
4 On the other hand, there may be other dimensions in the patient-doctor relationship which  
5 seem to rather point to a “substitute” relationship with information on the Internet. For  
6 instance, the fact that respondents who feel that their doctor explains things clearly are less  
7 likely to use online rating websites, suggests that when they are generally more satisfied  
8 with the feedback provided by their doctor they are less concerned about finding about  
9 alternative doctors and compare them with their current GP.  
10

11 This result on a “substitute relationship” is consistent with previous evidence by Diaz and  
12 colleagues<sup>12</sup> that found that 11% of their respondents said they would rather use the  
13 Internet ‘instead of seeing or speaking with their doctors’, and that 59% of respondents  
14 ‘did not discuss information with their doctors’. It also seems in line with the study by  
15 McMullan<sup>15</sup> that indicates that patients who become dissatisfied with the information  
16 provided to them by the health professionals are more likely to seek confirmation of the  
17 information given and additional information on the Internet.  
18  
19

20 As for the other aspects of the patient-doctor relationship, the finding that the more  
21 autonomous patients are in their healthcare decisions, the more willing they are to use the  
22 rating websites is also consistent with previous evidence: a study by McMullan<sup>15</sup>, for  
23 instance, reports that patients would seek health information before a consultation ‘to  
24 manage their own healthcare independently’. These may be the type of people who are  
25 ‘more likely to be health-oriented’ or ‘health conscious’, and therefore be more proactive  
26 in consultations.<sup>23</sup>  
27  
28

29 Moreover, the positive association between willingness to use doctor rating websites and  
30 levels of satisfaction with the level of choice of GP, and of outpatient appointments in the  
31 hospital, can be considered as reinforcing the above discussed interpretation that some  
32 dimensions of the doctor-patient relationship may be “complementary” with online  
33 information. For instance, patients who are more satisfied with their GP because they feel  
34 the latter is more friendly and empathic may also be more likely to engage more actively  
35 with health and healthcare information more generally. These results, together with the  
36 finding that the respondents who are more satisfied with the level of choice of treatments  
37 are less likely to use the websites, suggest that the choice of doctors and providers may be  
38 seen as only instrumental for the choice of treatment, and therefore respondents that are  
39 happy with treatment choice levels are less likely to shop around for different doctors’  
40 opinions.  
41  
42

### 43 **General discussion**

44  
45  
46 Overall, our evidence on the determinants of intention to use is broadly consistent with  
47 recent findings from the literature. Indeed, a study by Stevenson and colleagues<sup>24</sup> shows  
48 that although patients use the Internet increasingly more, they show no intention of doing  
49 so with the aim of disrupting the existing balance of roles during the doctor-patient  
50 consultation. They all mentioned the Internet as an additional resource of health and  
51 healthcare information. Other evidence suggests that patients with hypertension who  
52 search for more information on the Internet, in addition to that they receive from their  
53 doctor, may be more engaged in their treatment, and therefore more willing to adhere to  
54 medication prescribed by them.<sup>25</sup>  
55  
56

57 Our findings that online information can be used not only as “substitute” but also, and  
58 perhaps mainly, as “complementary” to several dimensions of the doctor-patient  
59  
60

1  
2  
3 relationship do not seem to entail any particular evidence suggesting that online ratings  
4 may put in danger the doctor-patient relationship, an important aspect which has been  
5 raised in the literature.<sup>26,27</sup>  
6

7 The “complementarity” findings, in particular, seem consistent with the evidence from the  
8 US which shows that the vast majority of the reviews by patients are generally rather  
9 positive.<sup>7,8,28</sup> Taken together, this evidence can be seen as providing little support to the  
10 related concern that the likeliest to use online ratings and enter actual comments may be  
11 the most disgruntled patients.<sup>29</sup>  
12

13  
14 On a related topic, concerns have been expressed about the ability of online ratings to  
15 truly reflect the quality of care. A recent UK study, however, demonstrated a strong  
16 relationship between the ratings reported online and more objective measures of clinical  
17 quality such as mortality and infection rates,<sup>30</sup> while another study showed that online  
18 ratings were associated with ratings derived from a traditional paper-based survey.<sup>31</sup>  
19 Online ratings, thus, do not seem to provide systematically biased or misleading  
20 information regarding the health care that patients receive, at least not more than a  
21 traditional survey would do. Consistently with this evidence, our results seem to support  
22 the idea that patients may see online ratings as a supplementary information base to be  
23 used in support of direct interaction with their doctor, which remains the most significant  
24 and reliable information channel.<sup>32</sup>  
25

26  
27 More generally, the evidence provided by our study confirms that the actual usage of  
28 doctor-rating websites in the UK remains particularly low. In our sample only 29  
29 respondents out of 200 were aware of the existence of the patient rating websites. Among  
30 these, however, only 6 subjects reported they were actually using those websites.  
31

32  
33 These figures are substantially in line with previous evidence brought forward from the  
34 literature for the UK.<sup>5,6</sup> The fact that even in the US, a more market-oriented health  
35 system, the use of similar sites is not much higher may suggest that the slow uptake in the  
36 UK cannot be attributed only to the early stage of the “choice” model. Considered together  
37 these results may pose serious concerns on the reasons and consequences of the lack of  
38 patient awareness and usage of online health related information.

39 Previous studies in the US have reported a number of reasons behind this slow uptake,  
40 including i) the preference for more traditional information channels, such as  
41 recommendations by family and friends; ii) the lack of time; and iii) in many cases the fact  
42 that people do not recognise that the quality of care may vary.<sup>27</sup>  
43

44 Our study confirms that not only awareness of rating websites is still limited among the  
45 general public in the UK, but awareness and willingness to use per se do not seem a  
46 sufficient condition to guarantee active usage. This poses a double challenge from a  
47 clinician and health policy perspective.  
48

49 In fact, on the one hand, the documented correlation between online ratings and other  
50 measures of healthcare quality, including survey-based ratings and clinical quality  
51 indicators,<sup>30,31</sup> necessarily requires that patients have already gone through three  
52 preliminary hurdles, namely i) being aware of, ii) having effective access to, and ii) being  
53 active users of the doctor rating websites. If the ultimate goal is indeed the continuous  
54 enhancement of healthcare quality, the effective removal of this double hurdle is likely to  
55 become the next priority to guarantee the full spread of online rating website.  
56  
57  
58  
59  
60



1  
2  
3 On the other hand, while appropriate online and offline informational campaigns are likely  
4 to overcome the first hurdle, thus effectively raising patients' awareness of online ratings  
5 as a potential source of information on provider quality, informational campaigns alone  
6 can fail to grant effective access and effectively trigger changes in behaviour. Alike in  
7 several other health contexts, in fact, 'nudging' behaviour may be difficult as a mere  
8 consequence of accessing more information.  
9

10  
11 If this is the case, other avenues should be explored to increase the active usage of rating  
12 websites by patients who are already aware of them. For instance, the evidence brought  
13 forward by the present study confirms the importance of the doctor-patient relationship as  
14 a factor determining individuals' awareness of and willingness to use online ratings<sup>27,33-36</sup>  
15 and suggests that tailored behavioural interventions based on the doctor-patient  
16 relationship have the potential to help patients to overcome this last hurdle and actively  
17 engage with online ratings.  
18

### 19 20 21 **Limitations of the study**

22  
23 The convenience field survey was considered the most appropriate administration mode to  
24 involve a sample of respondents from the general population. An online survey, in fact, by  
25 exclusively reaching the segment of active internet users, would have failed to address the  
26 main goal of the study, whether the users of doctor-rating websites are fairly  
27 representative of the general public  
28

29  
30 However, while dictated by practical issues, the convenience sampling is a limitation of  
31 the study, and tends to over-represent respondents who are currently not employed, such  
32 as unemployed, retired and students. Also the fact that the study was conducted in only  
33 one borough of London limits the possibility to immediately generalise the findings to the  
34 broader UK population.  
35

36  
37 In an attempt to make such limitations of smaller concern to enhance the external validity  
38 and generalisability of the analysis, we have i) chosen a borough which comprises a mix  
39 of both affluent and deprived neighbourhoods from heterogeneous ethnic backgrounds; ii)  
40 conducted surveys in the field at different public locations and at different times of the  
41 day and of the week to approach both working and non-working members of the public;  
42 and iii) controlled for a wide range of socio-demographic measures in the statistical  
43 analysis.  
44

### 45 46 47 **CONCLUSIONS**

48  
49 This study brings forward direct evidence suggesting that the awareness and actual usage  
50 of doctor-rating websites in the UK remains particularly low. In a sample of the general  
51 public from a borough of London only 29 respondents out of 200 were aware of the  
52 existence of the patient rating websites, and only 6 reported to be actually using those  
53 websites.  
54

55  
56 By collecting a broad range of information on the socio-demographic characteristics of the  
57 respondents, their views and perceptions of the most important aspects of healthcare  
58  
59

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

quality, patient choice, and doctor-patient relationship, the study also explicitly explores the determinants of respondents' awareness of the doctor ratings websites, and of their intention to use the sites in the future.

Among other results, the statistical analysis provides evidence that the GP-patient gender concordance is associated with higher awareness of, and intention to use, the websites, while respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

The existence of both “substitute” and “complementary” effects between the doctor-patient and the Internet information channels is not at all conflicting. In fact, they both indicate that the level of concordance achieved during the consultation is likely to define whether or not individuals will seek for further information channels, such as the Internet.

When the outcome of a consultation does not satisfy the patient, the use of Internet fills the gap of information needs. The intention to use online doctor-rating websites in this case also indicates that these patients are likely to look at these websites with the aim of seeking for another clinician. Individuals who are satisfied with their GPs may also search these websites, but more as an additional information channel as they seem keener to engage more actively with health and healthcare information in general.

The findings of our study thus contribute also to the wider debate on the inter-relationships between Internet usage and the doctor-patient relationship.<sup>7,27,28,33-36</sup> The argument, sometimes addressed by the previous literature, that information on the Internet can threaten the trust relationship and the balance of roles between doctors and patients, seems a concern which is not supported by our evidence. If any, a potential challenge to the doctor-patient relation can only affect the patients who already feel dissatisfied with the ability of their doctor to listen to them and provide them enough information regarding their condition, or with the level of their choice for healthcare treatments.

The above, however, can hardly be seen as a serious threat by those who advocate a greater choice by patients. On the contrary, if the latter is indeed a priority in the health policy agenda, online information on healthcare providers should be seen as a challenging opportunity to enhance patients' choice in healthcare, and public engagement with health information, especially for the less favoured segments of the population. Indeed, our findings suggest that subjects of non-white background and with lower income are more willing to use online ratings.

Finally, our study highlights that subjects who use doctor rating websites are unlikely to be representative of the overall patients' pool. In particular, they tend to over-represent opinions from young, non-white British, medium-low income patients who are not satisfied with their choice of healthcare treatments. Accounting for differences in the users' characteristics is important when interpreting results from doctor-rating sites and when informing interventions that aim at enhancing the public engagement with health information on the Internet, and the representativeness of the users who seek and provide feedback online.

1  
2  
3 **Data sharing:** technical appendix, statistical code and dataset available from the  
4 corresponding author at [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk). Consent for data sharing was not  
5 obtained but the presented data are anonymised and risk of identification is low.  
6

7 All authors had full access to all the data in the study and take responsibility for the  
8 integrity of the data and the accuracy of the data analysis.  
9

10  
11 **Funding:** this piece of work has not received any specific funding.  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

For peer review only

## REFERENCES

1. Department of Health. The NHS Plan: a plan for investment, a plan for reform. Crown 2000. Cm 4818-I.
2. Department of Health. The NHS Improvement Plan: Putting people at the heart of public services. London: The Stationery Office 2004. Cm 6268.
3. Department of Health. Creating a patient-led NHS: Delivering the NHS Improvement Plan. London: The Stationery Office 2005.
4. Department of Health. High Quality Care For All: NHS Next Stage Review final report. London: The Stationery Office 2008. Cm 7432.
5. Dixon A, Robertson R, Appleby J, et al. Patient Choice. London: The Kings Fund 2010 [http://www.kingsfund.org.uk/publications/patient\\_choice.html](http://www.kingsfund.org.uk/publications/patient_choice.html)
6. Department of Health. Report of the National Patient Choice Survey, England. Crown 2008.
7. Lagu T, Hannon NS, Rothberg MB, et al. Patients' Evaluations of Health Care Providers in the Era of Social Networking: An Analysis of Physician-Rating Websites. *J Gen Intern Med* 2010;**25**(9):942-6.
8. Gao GG, McCullough JS, Agarwal R et al. A Changing Landscape of Physician Quality Reporting: Analysis of Patients' Online Ratings of Their Physicians Over a 5-Year Period. *J Med Internet Res* 2012; **14**(1):e.38.
9. Appleby J, Alvarez A. Public Responses to NHS Reform. In British Social Attitudes Survey 22nd Report, London: Sage Publications 2005.
10. Ybarra M, Suman M. Help seeking behavior and the Internet: A national survey. *Int J Med Inform* 2006;**75**(1): 29-41.
11. Cohen J. Statistical Power Analysis for the Behavioural Sciences. Academic Press, New York and London 1969.
12. Diaz JA, Griffith RA, Ng JJ, et al. Patients' use of the Internet for medical information. *J Gen Intern Med* 2002;**17**(3): 180-185.
13. Office for National statistics. 2001 Census: Key Statistics. 2001. Available from: <http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.doa=3&b=276755&c=hammersmith&d=13&e=15&g=334516&i=1001x1003x1004&m=0&r=1&s=1273150763921&enc=1&dsFamilyId=47>
14. Kaiser Family Foundation, 2008 Update on consumers' views of patient safety and quality information. Kaiser Family Foundation. <http://www.kff.org/kaiserpolls/posr101508pkg.cfm>
15. McMullan M. Patients using the Internet to obtain health information: how this affects the patient-health professional relationship. *Patient Educ Couns* 2006;**63**(1-2): 24.
16. Cotten SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. *Soc Sc Med* 2004;**59**(9): 1795-1806.
17. Brodie M, Flournoy RE, Altman DE, et al. Health information, the Internet, and the digital divide. *Health Affairs* 2000; **19**(6): 255-265.
18. Health on the Net Foundation. HON's fourth survey on the use of the Internet for medical and health purposes, 1999.
19. Fox L, Rainie J, Horrigan A, et al. The online healthcare revolution: How the web helps Americans take better care of themselves, Pew Internet and American Life Project, 2000.
20. Baker L, Wagner TH, Singer S, et al. Use of the Internet and e-mail for health care information. *JAMA* 2003; **289**(18): 2400-6.

- 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
  - 10
  - 11
  - 12
  - 13
  - 14
  - 15
  - 16
  - 17
  - 18
  - 19
  - 20
  - 21
  - 22
  - 23
  - 24
  - 25
  - 26
  - 27
  - 28
  - 29
  - 30
  - 31
  - 32
  - 33
  - 34
  - 35
  - 36
  - 37
  - 38
  - 39
  - 40
  - 41
  - 42
  - 43
  - 44
  - 45
  - 46
  - 47
  - 48
  - 49
  - 50
  - 51
  - 52
  - 53
  - 54
  - 55
  - 56
  - 57
  - 58
  - 59
  - 60
21. Wald HS, Dube CE, Anthony DC. Untangling the Web-The impact of internet use on health care and the physician-patient relationship. *Patient Educ Couns* 2007; **68**(3): 218-224.
22. Bertakis KD. The influence of gender on the doctor-patient interaction. *Patient Educ Couns* 2009;**73**(3): 356-60.
23. Dutta-Bergman MJ. Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. *J Med Internet Res* 2004;**6**(2): e15.
24. Stevenson FA, Kerr C, Murray E, et al. Information from the Internet and the doctor-patient relationship: the patient perspective – a qualitative study. *BMC Fam Pract* 2007;**8**: 47.
25. Stavropoulou C. Perceived information needs and non-adherence: evidence from Greek patients with hypertension. *Health Expect* 2012;**15**(2): 187-196.
26. McCartney M. Will doctor rating sites improve the quality of care? *BMJ* 2009: **338b** 1033.
27. Lagu T and Lindenauer PK. Putting the public back in public reporting of health care quality. *JAMA* 2010;**304**(15):1711-1712.
28. López A, Detz A, Ratanawongsa N, et al. What Patients Say About their Doctors Online: A Qualitative Content Analysis. *J Gen Intern Med* 2012;**27**(6):685-92.
29. Wachter B. The patient will rate you now. 2012 Available at: <http://community.the-hospitalist.org/2012/03/19/the-patient-will-rate-you-now>
30. Greaves F, Pape U, King D, et al. Associations between internet-based patient ratings and conventional surveys of patient experience in the English NHS: an observational study. *BMJ Qual Saf* 2012; **21**: 600-605.
31. Greaves F, Pape UJ, King D, et al. Associations between Web-based patient ratings and objective measures of hospital quality. *Arch Intern Med* 2012;**172**: 435-436.
32. Coulter A, Ellins J, Swain D, et al. Assessing the quality of information to support people in making decisions about their health and healthcare. Picker Institute Europe. 2006 Nov. Retrieved from [http://www.pickereurope.org/assets/content/pdf/Project\\_Reports/Health-information-quality-web-version-FINAL.pdf](http://www.pickereurope.org/assets/content/pdf/Project_Reports/Health-information-quality-web-version-FINAL.pdf)
33. Nwosu CR, Cox BM. The impact of the Internet on the doctor-patient relationship. *Health Informatics Journal* 2000;**6**(3): 156-161.
34. Broom A. Virtually He@lthy: The Impact of Internet Use on Disease Experience and the Doctor-Patient Relationship. *Quality Health Research* 2005;**15**(3): 325-345.
35. Gorrindo T. Web searching for information about physicians. *JAMA* 2008; **300**(2): 213.
36. Malone M, Mathes L, Dooley J et al. Health information seeking and its effect on the doctor-patient digital divide. *Journal of Telemedicine and Telecare* 2005: **11** (Suppl.1): S1:25-28.

**Appendix**  
**Table 1 Variable description and descriptive statistics**

Variable	Obs	Mean	Std. Dev
<b>Awareness (<i>Awareness</i>) (0=no, 1=yes)</b>	200	0.142	0.350
<b>Intention to use (<i>IntentionToUse</i>)</b>	199	2.136	0.743
<b>Not likely</b>	43		
<b>Quite likely</b>	86		
<b>Likely</b>	70		
<b>Important factors in making decisions (1=not important at all, 5=very important)</b>			
<b>Waiting lists (<i>HC_Waiting</i>)</b>	198	3.818	1.165
<b>Rates of hospital-acquired complications (<i>HC_HospComp</i>)</b>	188	3.761	1.193
<b>Clinical performance (<i>HC_Clinical_Performance</i>)</b>	189	4.037	1.136
<b>Closeness to home (<i>HC_CloseHome</i>)</b>	200	3.683	1.265
<b>Familiarity with the doctor (<i>HC_Familiarity</i>)</b>	194	3.237	1.306
<b>Financial performance of the hospital (<i>HC_FinPerform</i>)</b>	191	2.387	1.164
<b>Reputation of the doctor (<i>HC_GP_Reputation</i>)</b>	199	3.980	1.137
<b>Accessibility and parking facilities (<i>HC_Access</i>)</b>	192	2.656	1.321
<b>Past experience with the provider (<i>HC_PastExp</i>)</b>	193	3.544	1.311
<b>Important sources of information in making decisions (1=not important at all, 5=very important)</b>			
<b>GP advice (<i>SI_GP_Advice</i>)</b>	198	4.071	1.030
<b>Published hospital statistics (<i>SI_HospStat</i>)</b>	183	2.934	1.193
<b>Online doctor rating websites (<i>SI_DoctorRating</i>)</b>	178	2.315	1.204
<b>Personal experiences in the past (<i>SI_PastExp</i>)</b>	192	4.234	1.004
<b>Feedback from family/friends (<i>SI_Family</i>)</b>	194	4.149	0.924
<b>I feel the doctor...</b>			
<b>...listens (0=no, 1=yes) (<i>DOC_Listens</i>)</b>	200	0.575	0.496
<b>...has time (0=no, 1=yes) (<i>DOC_Time</i>)</b>	200	0.410	0.493
<b>...explains (0=no, 1=yes) (<i>DOC_Explains</i>)</b>	200	0.555	0.498
<b>...is friendly (0=no, 1=yes) (<i>DOC_Friend</i>)</b>	200	0.445	0.498
<b>... Is someone I can trust (0=no, 1=yes) (<i>DOC_Trust</i>)</b>	200	0.550	0.499
<b>I feel that online rating is a reliable measure (1=very unreliable, 5=very reliable) (<i>Reliable</i>)</b>	141	2.759	1.055
<b>How actively do you participate with your GP in making decisions (<i>Participation</i>)</b>	193		
<b>My doctor always makes decisions for me</b>	2		
<b>I like to know the options available but still let my doctor decide for me</b>	13		
<b>My doctor and I make the decisions together</b>	25		
<b>I make decisions for myself, after considering the advice of my GP</b>	65		
<b>I always make my own decisions, independently of the advice of my GP</b>	75		
<b>I make decisions with my parents/spouse/relatives</b>	13		
<b>Satisfied with the current level of choice of... (1 = strongly dissatisfied, 5 = strongly satisfied)</b>			
<b>...GP (<i>SAT_C_GP</i>)</b>	173	3.451	1.138
<b>...hospital (<i>SAT_C_Hosp</i>)</b>	152	3.493	1.055
<b>...doctor (<i>SAT_C_Doc</i>)</b>	139	3.252	1.022
<b>...treatment (<i>SAT_C_Treatment</i>)</b>	148	3.554	0.928
<b>...time spent (<i>SAT_C_Time</i>)</b>	168	3.179	1.123

<b>Ethnicity</b>				
<b>White British (0=no, 1=yes) (WhiteBritish)</b>	200	0.488	0.501	
<b>White Other (0=no, 1=yes) (WhiteNonBritish)</b>	200	0.222	0.417	
<b>Highest level of educational attainment* (Education)</b>				
<b>1 if GCSE</b>	12			
<b>2 if A-Level/BTEC/Vocational</b>	36			
<b>3 if University undergraduate degree</b>	86			
<b>4 if Postgraduate Degree</b>	52			
<b>Age (years) (Age)</b>	199	39.572	16.083	
<b>Gender (Gender)</b>				
<b>Female (=1)</b>	112			
<b>Male (=0)</b>	88			
<b>Income (Income)</b>				
<b>0</b>	40			
<b>&lt;£15000 but &gt;0</b>	27			
<b>£15,000-£35,000</b>	36			
<b>£35,000-55,000</b>	22			
<b>£55,000-£75,000</b>	14			
<b>£75,000-£95,000</b>	7			
<b>&gt;£95,000</b>	14			
<b>Doctor-patient concordance</b>				
<b>Age Match (=1 if doctor and patient belong to the same age bracket; =0 otherwise) (AgeMatch)</b>	200	0.333	0.473	
<b>Gender Match (=1 if patient and doctor are of same gender; =0 otherwise) (GenderMatch)</b>	200	0.444	0.498	

Table 2: Bivariate Correlations

	IntentionToUse	Awareness		IntentionToUse	Awareness
<b>IntentionToUse</b>	1		<b>DOC_Friend</b>	0.0127 (0.8599)	-0.0984 (0.1667)
<b>Awareness</b>	0.0846 (0.2359)	1	<b>DOC_Trust</b>	-0.0288 (0.6899)	-0.0388 (0.5863)
<b>HC_Waiting</b>	0.1617** (0.025)	0.016 (0.8236)	<b>Participation</b>	0.0412 (0.5678)	0.0189 (0.7911)
<b>HC_HospComp</b>	0.1474** (0.0465)	-0.0033 (0.9643)	<b>SAT_C_GP</b>	-0.0419 (0.591)	0.122 (0.1108)
<b>HC_Clinical_Performance</b>	0.2146*** (0.0034)	-0.0784 (0.2849)	<b>SAT_C_Hosp</b>	-0.003 (0.9715)	0.1024 (0.2111)
<b>HC_CloseHome</b>	-0.0623 (0.3848)	-0.0998 (0.1587)	<b>SAT_C_Doc</b>	-0.0348 (0.6909)	0.137 (0.1077)
<b>HC_Familiarity</b>	-0.0078 (0.9153)	-0.0752 (0.2986)	<b>SAT_C_Treatment</b>	-0.0157 (0.8526)	0.0932 (0.2598)
<b>HC_FinPerform</b>	0.1253** (0.0884)	0.1435** (0.0482)	<b>SAT_C_Time</b>	-0.0239 (0.7632)	0.0541 (0.4878)
<b>HC_GP_Reputation</b>	0.2020*** (0.0047)	-0.016 (0.8234)	<b>CB_AWARE</b>	-0.0381 (0.5972)	0.2997*** (0)
<b>HC_Access</b>	0.0451 (0.5399)	0.1196* (0.0992)	<b>CB_Use</b>	0.0996 (0.1651)	0.054 (0.4477)
<b>HC_PastExp</b>	0.0978 (0.182)	-0.0244 (0.7369)	<b>WEB_Access</b>	0.2054*** (0.0041)	0.1197* (0.0923)
<b>SI_GP_Advice</b>	0.1054 (0.1457)	0.0163 (0.8202)	<b>AgeMatch</b>	0.1373* (0.0532)	0.0695 (0.3234)
<b>SI_HospStat</b>	0.2937*** (0.0001)	0.1159 (0.1192)	<b>GenderMatch</b>	0.2077*** (0.0032)	0.1472** (0.0357)
<b>SI_DoctorRating</b>	0.3759*** (0)	0.1240* (0.099)	<b>WhiteBritish</b>	-0.0429 (0.5477)	-0.0662 (0.3468)
<b>SI_PastExp</b>	0.0563 (0.4455)	-0.0803 (0.2696)	<b>WhiteNonBritish</b>	-0.0017 (0.9809)	-0.0853 (0.2252)
<b>SI_Family</b>	0.1215* (0.0958)	-0.0511 (0.4804)	<b>Income</b>	0.012 (0.8818)	-0.1219 (0.1246)
<b>Reliable</b>	0.3429*** (0)	-0.0311 (0.7153)	<b>Education</b>	-0.0103 (0.8913)	0.0023 (0.9757)
<b>DOC_Listens</b>	0.0629 (0.3824)	-0.0888 (0.2122)	<b>Gender</b>	0.0315 (0.6614)	-0.0087 (0.9029)
<b>DOC_Time</b>	0.1565** (0.0289)	-0.0117 (0.87)	<b>Age</b>	-0.1081 (0.1344)	-0.1918*** (0.0068)
<b>DOC_Explains</b>	0.0968 (0.1784)	0.0152 (0.8314)			

P-Values in parentheses. \* p<.10, \*\* p<.05, \*\*\* p<.01



Table 3 Odds Ratios for the Binary Logit explaining the awareness of doctor rating websites.

	Model 1	Model 2	Model 3	Model 4
<b>Awareness</b>				
<b>Age</b>	0.953*	0.931**		
	(0.0239)	(0.0307)		
<b>Gender</b>	1.347	1.819		
	(0.648)	(1.092)		
<b>WhiteBritish</b>	0.595	0.841	0.401	0.0150**
	(0.309)	(0.524)	(0.276)	(0.0292)
<b>WhiteNonBritish</b>	0.273*	0.398	0.228*	0.00399**
	(0.198)	(0.324)	(0.200)	(0.00957)
<b>Education</b>	1.105	1.396	1.279	1.682
	(0.341)	(0.534)	(0.438)	(1.399)
<b>Income</b>	0.952	0.943	0.708*	0.228*
	(0.157)	(0.169)	(0.132)	(0.180)
<b>HC_HospComp</b>		1.173	1.353	2.237
		(0.366)	(0.442)	(1.825)
<b>HC_Clinical_Performance</b>		0.691	0.527	0.0342*
		(0.245)	(0.207)	(0.0609)
<b>HC_Familiarity</b>		0.710	0.756	2.564
		(0.170)	(0.202)	(2.096)
<b>HC_GP_Reputation</b>		1.409	1.611	13.57*
		(0.509)	(0.599)	(19.95)
<b>HC_FinPerform</b>		0.921	0.963	0.0783**
		(0.264)	(0.297)	(0.0919)
<b>HC_Access</b>		1.112	1.088	0.917
		(0.236)	(0.242)	(0.444)
<b>SI_GP_Advice</b>		1.173	0.922	1.115
		(0.350)	(0.290)	(0.718)
<b>SI_HospStat</b>		1.291	1.390	49.75**
		(0.410)	(0.477)	(87.28)
<b>SI_Family</b>		0.935	0.614	0.146
		(0.361)	(0.273)	(0.186)
<b>SI_PastExp</b>		0.762	1.202	0.284
		(0.275)	(0.499)	(0.343)
<b>SI_DoctorRating</b>		0.938	0.933	1.859
		(0.261)	(0.271)	(1.119)
<b>DOC_Listens</b>			0.416	1.182
			(0.324)	(2.244)
<b>DOC_Time</b>			1.289	0.00185**
			(0.950)	(0.00580)
<b>DOC_Explains</b>			2.533	0.885
			(1.799)	(1.658)
<b>DOC_Friend</b>			0.752	15.62
			(0.535)	(30.63)
<b>DOC_Trust</b>			0.930	3.173
			(0.583)	(4.555)
<b>Participation</b>			1.080	3.346
			(0.298)	(2.835)
<b>AgeMatch</b>			2.247	269.4*
			(1.429)	(791.0)
<b>GenderMatch</b>			3.153*	32.77*
			(1.867)	(61.36)
<b>SAT_C_GP</b>				3.020
				(2.948)
<b>SAT_C_Hosp</b>				0.802
				(1.134)

<b>SAT_C_Doc</b>	2.794
	(3.411)
<b>SAT_C_Treatment</b>	1.818
	(2.311)
<b>SAT_C_Time</b>	0.735
	(0.550)
<b>Same GP</b>	0.641
	(0.766)

Exponentiated coefficients; Standard errors in parentheses

\* p<.10, \*\* p<.05, \*\*\* p<.01

For peer review only

Table 4 Odds Ratios for the Ordered Logit explaining the likelihood to use doctor rating websites

	m1	m2	m3	m4	m5	m6
<b>AgeMatch</b>	1.974 (2.377)	2.561 (2.953)	2.000 (1.965)	2.782 (2.613)	1.051 (0.818)	0.946 (0.729)
<b>GenderMatch</b>	18.42* (30.24)	12.03* (17.75)	10.45** (12.33)	10.39** (10.54)	16.67*** (15.48)	14.83*** (13.17)
<b>Awareness</b>	0.0531 (0.108)	0.0505 (0.0971)	0.0964 (0.149)	0.0758** (0.0985)	0.159* (0.176)	0.147* (0.152)
<b>HC_Clinical_Performance</b>	9.289* (11.84)	7.659* (8.241)	5.560** (4.759)	3.401* (2.253)	4.395** (2.653)	4.985*** (2.734)
<b>HC_Familiarity</b>	0.359 (0.287)	0.468 (0.282)	0.371* (0.220)	0.414* (0.206)	0.355** (0.147)	0.351*** (0.141)
<b>HC_GP_Reputation</b>	2.328 (1.980)	2.827 (2.106)	3.608* (2.542)	4.410** (2.753)	2.903** (1.374)	2.776** (1.260)
<b>SI_GP_Advice</b>	0.170* (0.173)	0.223 (0.206)	0.238** (0.167)	0.283** (0.176)	0.344** (0.186)	0.396* (0.193)
<b>SI_HospStat</b>	14.26** (18.84)	13.74** (15.60)	7.220*** (5.008)	6.550*** (4.200)	5.371*** (2.932)	5.133*** (2.703)
<b>SI_DoctorRating</b>	1.596 (1.636)	1.067 (0.958)	1.424 (0.851)	1.461 (0.770)	2.245** (0.835)	2.312** (0.876)
<b>Reliable</b>	6.181 (7.691)	8.682* (9.969)	6.492** (4.993)	7.586*** (5.561)	4.457*** (2.351)	4.061*** (2.003)
<b>DOC_Listens</b>	141.9* (424.8)	51.44 (126.4)	44.20* (90.99)	27.05** (41.26)	22.03** (28.29)	22.98** (28.34)
<b>DOC_Explains</b>	0.00690* (0.0183)	0.00680** (0.0148)	0.00509** (0.0105)	0.00695*** (0.0124)	0.0120*** (0.0171)	0.0124*** (0.0169)
<b>DOC_Friend</b>	12.88 (29.23)	8.375 (14.65)	16.48** (22.41)	19.66*** (22.45)	8.718** (8.047)	7.781** (6.896)
<b>Participation</b>	5.473* (5.255)	5.818* (5.410)	5.171** (3.664)	4.162** (2.687)	2.349* (1.126)	2.228* (1.036)
<b>SAT_C_GP</b>	17.03* (27.58)	8.038 (10.23)	6.593* (6.659)	5.410** (4.048)	4.692** (2.889)	4.377*** (2.484)
<b>SAT_C_Hosp</b>	21.93** (33.71)	22.86** (30.90)	30.01*** (33.63)	34.38*** (35.43)	17.95*** (15.52)	11.11*** (7.578)
<b>SAT_C_Treatment</b>	0.0515** (0.0764)	0.0561** (0.0794)	0.111** (0.106)	0.147** (0.125)	0.145** (0.111)	0.111*** (0.0788)
<b>WhiteBritish</b>	0.0137* (0.0318)	0.0409* (0.0738)	0.0542** (0.0782)	0.0539** (0.0690)	0.0909** (0.0890)	0.105** (0.0973)
<b>Income</b>	0.416* (0.190)	0.382** (0.162)	0.449** (0.154)	0.513** (0.154)	0.476*** (0.129)	0.462*** (0.120)
<b>SAT_C_Doc</b>	0.242 (0.468)	0.243 (0.374)	0.148* (0.161)	0.135* (0.144)	0.427 (0.321)	
<b>SI_PastExp</b>	0.670 (0.787)	0.590 (0.650)	0.535 (0.576)	0.551 (0.250)		
<b>Education</b>	0.486 (0.526)	0.583 (0.554)	0.683 (0.443)	0.610 (0.328)		
<b>HC_Access</b>	1.046 (0.659)	1.124 (0.678)	1.241 (0.564)	1.347 (0.565)		
<b>HC_PastExp</b>	1.030 (0.578)	0.914 (0.487)	0.930 (0.397)			
<b>SI_Family</b>	1.208 (1.357)	1.305 (1.484)	1.439 (1.458)			
<b>DOC_Time</b>	1.223 (2.118)	2.099 (3.261)	2.594 (3.547)			

<b>DOC_Trust</b>	0.153	0.608	0.460			
	(0.327)	(0.983)	(0.629)			
<b>WEB_Access</b>	1.122	0.558	0.483			
	(4.345)	(1.763)	(0.918)			
<b>HC_Waiting</b>	0.960	1.097				
	(0.806)	(0.846)				
<b>HC_HospComp</b>	1.200	0.790				
	(0.929)	(0.540)				
<b>HC_CloseHome</b>	0.930	0.790				
	(0.726)	(0.516)				
<b>HC_FinPerform</b>	0.610	0.692				
	(0.621)	(0.588)				
<b>SAT_C_Time</b>	1.449	1.530				
	(1.441)	(1.280)				
<b>WhiteNonBritish</b>	0.742	0.493				
	(1.790)	(1.041)				
<b>CB_AWARE</b>	1.422					
	(3.158)					
<b>CB_Use</b>	83.93					
	(354.7)					
<b>_cut1</b>	9454769.9**	2474784.8**	3131224.6**	2460471.3***	10470831.2***	13892352.4***
	(63313549.3)	(15197453.2)	(18256829.6)	(13260544.4)	(45550085.5)	(59299449.7)
<b>_cut2</b>	7.05660e+09*	1.22556e+09***	1.14387e+09***	674102348.3***	1.42570e+09***	1.60379e+09***
	**					
	(5.66892e+10)	(8.86204e+09)	(7.69789e+09)	(4.20283e+09)	(7.17551e+09)	(7.78799e+09)

# QUESTIONNAIRE

---

## Imperial College Business School



We would be very grateful for your cooperation in completing this questionnaire. It should take around **10 minutes** to complete.

The data collected will contribute towards a study into the healthcare service in the UK. There are currently major changes taking place in the NHS, in an effort to improve the choice and quality of services available to the public. One of these changes has been the introduction of a system called “Choose & Book” which gives you the option to choose which hospital you wish to go to for your outpatient appointment, following a GP referral. This is a study into how individuals regard these new choices and how they make decisions about where to receive care. In particular, we are studying the awareness and use of online doctor rating websites as a source of information for patients. These doctor rating websites allow patients to rate their doctors and provide feedback based on their own experiences. The ratings can then be used by others when deciding where to receive health care.

All data collected will remain strictly confidential. The study is being conducted by researchers from Imperial College London and King’s College London. If you would like to be informed of the results of this study, please contact [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk).

## SECTION A

www.iwantgreatcare.com

www.NHSchoices.co.uk

www.patientopinion.co.uk

www.privatehealth.co.uk

**Q1. Are you aware of any of the above online doctor rating websites or any other doctor rating websites?**

Yes                      No  (if No, skip ahead to Section C)

Other (please specify).....

**Q2. How did you find out about these sites?**

Family/Friends                       Doctor

The Media                       Other (please specify).....

## SECTION B

**Q3. Have you used these websites in the past to look at doctor/hospital ratings?**

Yes                       No  (if No, skip ahead to Section C)

**Q4. What specialty of doctor have you searched for in the past in these websites?**

.....

**Q5. When do you use these websites?**

On a regular basis                       Only before/after an appointment  Rarely

**Q6. In the past, has the information on these websites influenced your choice of doctor/hospital?**

Yes                       No

**Q7. If Yes, was this based on positive or negative information on the websites?**

Positive information                       Negative information

**Q8. How easy to use do you find the sites?** Please circle the most appropriate number on a scale of 1 to 5 (1=very easy, 5=very difficult)

1            2            3            4            5

## SECTION C

**Q9. Which of the following factors are important to you in making decisions about where to receive healthcare?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important), or 'none of these'.

Waiting lists	1	2	3	4	5
Rates of hospital-acquired complications	1	2	3	4	5
Clinical performance rating	1	2	3	4	5
Closeness to home	1	2	3	4	5
Familiarity with the doctor	1	2	3	4	5
Financial performance of the hospital	1	2	3	4	5
Reputation of the doctor	1	2	3	4	5
Accessibility and parking facilities	1	2	3	4	5
Past experience with the provider	1	2	3	4	5
None of these					<input type="checkbox"/>

**Q10. Which of the following sources of information are important in making decisions about where to receive health care?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important).

GP advice	1	2	3	4	5
Published hospital statistics	1	2	3	4	5
Online doctor rating website	1	2	3	4	5
Personal experiences in the past	1	2	3	4	5
Feedback from family/friends	1	2	3	4	5

1  
2  
3 **Q11. To what extent do you think that the online rating of doctors by patients is a reliable**  
4 **measure of a doctor's performance?** Please circle the most appropriate number on a scale of 1 to 5  
5 (1=very unreliable, 5=very reliable)  
6  
7

8 1      2      3      4      5                      Not sure     

9  
10  
11  
12  
13 **Q12. If you have not used these websites before, how likely do you feel you will use them in**  
14 **the future?**

15  Not likely                       Quite likely                       Likely  
16  
17  
18  
19

---

## 20 SECTION D

21  
22 **Q13. These websites are based on patient input. Individuals can provide feedback based on**  
23 **their own experiences. Considering this, when would you be most likely to contribute to the**  
24 **online site?** Tick all that apply.

- 25  Every time  
26  After particularly positive experiences only  
27  After particularly negative experiences only  
28  After both positive and negative experiences  
29  Never  
30  Not sure

31  
32 **Q14. Out of the following what would be your motive for any contributions that you make to**  
33 **an online doctor rating site?** Tick all that apply.

- 34  I would not contribute to these websites  
35  To inform other patients  
36  To improve standards of care in the NHS  
37  As a method of complaint  
38  In appreciation of a doctor's service  
39  Not sure

---

## 40 SECTION E

41  
42 **Q15. Which of the following attributes would you use to describe your GP?** Tick all that apply.

- 43  I feel my doctor listens to my problems  
44  I feel my doctor spends enough time with me in each consultation  
45  I feel my doctor explains things clearly  
46  I feel my doctor is sociable and friendly  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



- 1  
2  
3  
4  
5  
6  
7  
8  
9
- I feel that I can trust my doctor's opinions  
 None of the above

10  
11  
12  
13

**Q16. How actively do you participate with your GP in making decisions about your health care generally?** Tick the single most appropriate.

- 14  
15  
16  
17  
18  
19  
20  
21
- My doctor always makes decisions for me  
 I like to know the options available but still let my doctor decide for me  
 My doctor and I make the decisions together  
 I make decisions for myself, after considering the advice of my GP  
 I always make my own decisions, independently of the advice of my GP  
 I make decisions with my parents/spouse/relatives

22  
23

**Q17. Within your GP practice do you always want to see the same GP for an appointment?**

- 24  
25  
26
- I always request to see the same GP  
 I don't mind which doctor I see.

27  
28  
29

**Q18. Where is choice more important to you in the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 =of no importance, 5 =very important) or select 'not sure'.

30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of appointment time (for primary & secondary care)	1	2	3	4	5	Not sure	<input type="checkbox"/>

50  
51  
52  
53  
54

**Q19. How satisfied are you with the current level of choice of where you can receive health care within the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 = strongly dissatisfied, 5 = strongly satisfied) or select 'not sure'.

55  
56  
57  
58  
59  
60

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>

Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of appointment time (for primary & secondary care)	1	2	3	4	5	Not sure	<input type="checkbox"/>

**Q20. Choose and Book is a new NHS system which gives you the option to choose which hospital you wish to go to for your outpatient appointment. Are you aware of this system?**

Yes                      No

**Q21. Have you used this Choose and Book system in the past?**

Yes                       No

**Q22. If you have used the Choose & Book system in the past, how actively have you participated in making decisions about where to receive care? Tick the single most appropriate.**

- I have never used Choose & Book
- My doctor always makes decisions for me
- I like to know the options available but still let my doctor decide for me
- My doctor and I make the decisions together
- I make decisions for myself, after considering the advice of my GP
- I always make my own decisions, independently of the advice of my GP
- I make decisions with my parents/spouse/relative

**Q23. When is the choice of hospital important to you, for outpatient referrals? Tick all that apply.**

- Routine outpatient consultation
- Day-case procedure/surgery
- Major surgery
- None of these

---

## SECTION F

**Q24. Do you have access to a computer/laptop with internet access, at home or at work?**

Yes                       No

**Q25. Have you used the internet in the past to search for health information?**

- Yes
- No

**Q26. If you do not use online doctor rating websites, which of the following factors stops you from doing so? Tick all that apply**

- I'm too busy to have the time to use them
- The sites are not a reliable source of information
- It is difficult to interpret the information provided
- I already have enough information from other sources to make choices
- I don't have access to the internet
- I did not know these websites existed
- I have never needed to use these websites

**Q27. What other internet websites involving ratings do you use? Tick all that apply.**

- Shopping websites (e.g. Amazon)
- Holiday websites (e.g. TripAdvisor)
- Car insurance websites (e.g. Compare The Market)
- Restaurants/venue websites (e.g. ViewLondon)
- Film websites (e.g. Rottentomatoes)
- Other (please specify).....
- I don't use any rating websites.

**Q28. What methods of rating do you feel are a useful form of feedback in these websites? Tick all that apply.**

- Star-rating out of 5
- Percentage scores
- Thumbs Up/Down
- Written comments from patients/users
- No preference

## SECTION G

We remind you that all personal data collected will remain confidential and is collected for academic purposes.

**Q29. What is your age? .....**

**Q30. What is your gender?**

- Male
- Female

**Q31. How would you describe your ethnicity?**

<input type="checkbox"/>	White – British	<input type="checkbox"/>	Other Asian – non-Chinese
<input type="checkbox"/>	White – Others	<input type="checkbox"/>	Black Caribbean

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

**Q32. What is your postcode? .....**

**Q33. How many other individuals do you live with? .....**

**Q34. Do you live with your parents?**

Yes  No

**Q35. What is/was your profession? .....**

Unemployed  Retired

**Q36. What is your level of pre-tax income?**

0  
 <£15000 but >0  £15,000-£35,000  
 £35,000-55,000  £55,000-£75,000  
 £75,000-£95,000  >£95,000

**Q37. What is your highest level of educational attainment?**

	GCSE		Other vocational degree
	A-Level		University degree
	BTEC		Postgraduate degree

**Q38. In the last year how many times have you had an outpatient hospital appointment?**

0 times  1-3 times  
 4-5 times  More than 5 times

**Q39. What is the sex of your GP?**

Male  Female

**Q40. How old is your GP?**

<30 years  
 30-50 years  
 >50 years

**Q41. What is the ethnicity of your GP?**

	White – British		Other Asian – non-Chinese
	White – Others		Black Caribbean

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

Q42. I cannot answer Q39, Q40, Q41 because I don't always see the same GP.

**This is the end of the questionnaire, thank you for your time.**

For peer review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stavropoulou<sup>3</sup>, Mihir Desai<sup>4</sup>,  
Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

**Declaration:** All authors have completed the Unified Competing Interest form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

**Copyright statement:** The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, a worldwide licence to the Publishers and its licensees in perpetuity, in all forms, formats and media (whether known now or created in the future), to i) publish, reproduce, distribute, display and store the Contribution, ii) translate the Contribution into other languages, create adaptations, reprints, include within collections and create summaries, extracts and/or, abstracts of the Contribution, iii) create any other derivative work(s) based on the Contribution, iv) to exploit all subsidiary rights in the Contribution, v) the inclusion of electronic links from the Contribution to third party material where-ever it may be located; and, vi) licence any third party to do any or all of the above.

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stavropoulou<sup>3</sup>, Mihir Desai<sup>4</sup>,  
Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

### Article summary

#### Article focus:

- To explore the awareness of the existence of doctor-rating and its usage among the general population.
- To understand the main predictors of what makes people ~~aware of, and~~ willing to use doctor-ratings websites.

#### Key messages:

- The share of the general public which uses doctor-rating websites is still quite low.
- Elderly, subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The doctor-patient relationship is a significant predictor of patients' ~~awareness of, and~~ intention to use, doctor-rating websites.

#### Strength and Limitations:

- Our study contributes to the literature of online health information where evidence on the determinants of people's ~~awareness of and~~ willingness to use doctor-rating websites is limited.
- The main limitation of the study is that we use a convenience sample from one borough of London, UK and therefore results cannot be immediately generalised to the UK population.

### Abstract

**Objectives:** To explore the extent at which doctor-rating websites are known and used among the general population. To understand the main predictors of what makes people ~~aware of, and~~ willing to use doctor-ratings websites.

**Design:** A cross-sectional study.

**Setting:** The Borough of Hammersmith and Fulham, London, England.

**Participants:** 200 individuals from the borough.

**Main outcome measures:** The likelihood of being aware of doctor-rating websites and the intention to use doctor-rating websites.

**Results:** The use and awareness of doctor-rating websites is still quite limited. Elderly, white British subjects, as well as respondents with higher income are less likely to use doctor-rating websites. The doctor-patient relationship also plays a key role in explaining ~~awareness of and~~ intention to use the websites: the GP-patient gender concordance is associated with higher ~~awareness of, and~~ intention to use, the websites. Respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites.

**Conclusions:** Online rating websites can play a major role in supporting patients' informed decisions on which health care providers to seek advice from, thus potentially fostering patients' choice in health care. Subjects who seek and provide feedback on

1  
2  
3 doctor-ranking websites, though, are unlikely to be representative of the overall patients'  
4 pool. In particular, they tend to over-represent opinions from young, non white British,  
5 medium-low income patients who are not satisfied with their choice of the healthcare  
6 treatments and the level of information provided by their GP. Accounting for differences  
7 in the users' characteristics is important when interpreting results from doctor-rating sites.  
8

### 9 Key messages

- 10 • The share of the general public which uses doctor-rating websites is still quite low.
- 11 • Elderly, subjects with white British background, as well as subjects with higher  
12 income are less likely to use doctor-rating websites.
- 13 • The GP-patient gender concordance is associated with higher ~~awareness of, and~~  
14 intention to use, the websites.
- 15 • Subjects who feel that their GP explains things clearly and is a valuable source of  
16 clear information, are less likely to use online rating websites.
- 17 • Subjects who feel that they are more satisfied with the level of choice of healthcare  
18 treatments are less likely to use online rating websites.
- 19
- 20
- 21

22 <sup>1</sup> London School of Economics, LSE Health and Centre for the Study of Incentives in Health

23 <sup>2</sup> Imperial College Business School

24 <sup>3</sup> University of Surrey

25 <sup>4</sup> Imperial College School of Medicine

26 <sup>5</sup> King's College London

27  
28 \*Corresponding author: Marisa Miraldo. Email: [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk)  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



## INTRODUCTION

In recent years, both the NHS Plan<sup>1</sup> and the NHS Improvement Plan<sup>2</sup>, set out the changes required for the English NHS to become more patient-focussed. Greater patient involvement in the running of the NHS has gone hand in hand with the policymakers' drive to improve the quality of public healthcare services. The 'bottom-up' approach to a more patient-centred NHS has typically focused on three main areas: i) giving users more choice and personalisation; ii) making funding respond to users' choices; and iii) engaging users through greater involvement.<sup>3</sup> Lord Darzi's 2008 report "High Quality Care For All - The Next Stage Review"<sup>4</sup> acknowledged that improvements to the NHS should focus on improving the quality of services, and that the best way of achieving this would be to ensure that services are locally responsive to the needs of the community, for instance, by empowering providers and patients as decentralised decision-makers in order to foster a culture of continuous quality improvement and innovation.

Websites, such as the *NHS Choices* and *Dr Foster Intelligence*, have been developed with the explicit aim of informing patients about the services that the NHS provides and therefore allowing a better choice of physicians and treatments. In principle, doctor-rating websites can have a profound impact on public involvement and patients' choice, as they enable patients to make more informed decisions on where to seek healthcare, and thus to engage more often in active choices concerning their health. In practice, however, relative little evidence is available on whether, and to what extent, doctor-rating websites are actually known and actively used in the UK.

A study by the Kings Fund<sup>5</sup> explored the information sources used by patients in making decisions about where to receive care. Only 4% of the patients used the NHS Choices website, with the majority instead drawing information from their own experiences (41%), and advice from GP (36%). Similarly, a national survey on patients' choice by the Department of Health found that the NHS Choices website was only used by 5% of respondents.<sup>6</sup> These figures are consistent with the evidence from the US where usage of doctor rating websites is still quite low.<sup>7,8</sup> Moreover, very little is known about the profile of individuals who are more likely to make active use of these sites. Appleby and Alvarez<sup>9</sup> found that women in England desire patient choice more than men (69% to 56%), suggesting that women may also be more likely to use patient sources of information such as rating sites. This is in line with findings from the US where women and younger adults are more active 'online health information seekers'.<sup>10</sup>

The aim of this study is to contribute to fill these gaps by providing more direct evidence on, first, the extent to which doctor ratings websites are known and used among the general public in a borough of London; and, second, the most significant predictors of the fact that people are willing to use doctor-ratings websites.

## METHODS

We conducted a self-administered survey to assess the extent and the determinants of i) the awareness of the existence of doctor-ratings websites; ii) the level of actual usage of those websites; iii) the intention to use doctor-ratings websites in the future.

~~The field survey was considered the most appropriate administration mode to involve a sample of respondents from the general population. An online survey, in fact, by exclusively reaching the segment of active internet users, would have failed to address the~~

~~main goal of the study, whether the users of doctor rating websites are fairly representative of the general public.~~

### Questionnaire design

Prior to the data collection a pilot study was conducted. The aim of the pilot was to gain an understanding of the practicalities associated with giving out questionnaires and collecting responses. After listening to feedback from pilot respondents, and looking at results from the pilot study, several changes were made to make the questionnaire easier to understand. The changes related to content, phrasing and ordering of questions.

The content of the final questionnaire was based on findings from the preliminary literature review and was designed to have a number of sections (see Appendix for full questionnaire). In particular, section A focuses on the awareness of online rating websites, while section B assesses actual usage of online rating websites. Section C measures the willingness to use the online rating websites in the future, and explores which aspects of the healthcare providers and which sources of information are perceived as being important factors in making decisions about where to receive healthcare. Section D assesses the individual contribution to the online rating sites, while section E focuses on aspects of the doctor-patient relationship and attitudes and dimensions of patient choice. Finally section F controls for internet usage, while section G collects a broad range of socio-demographic characteristics.

Closed questions were used, worded in a manner easy to understand. A limited number of responses were provided, either with binary options (e.g. yes or no), or with a numerical Likert scale ranging from 1 to 5, with a further option for “*Not sure*”.

A list of variables with a brief description is discussed in the Variables section and is summarised in Table 1 in the Appendix.

### Ethical approval, informed consent and confidentiality of responses

We completed the checklist for research ethics approval from Imperial College London. As interviews were intended to be conducted in public places among respondents from the general population, the study involved no risk or harm of any type to respondents, no link with clinical data was expected to take place, and no incentives were going to be paid to respondents, the study fitted all the criteria in the first stage checklist with no further formal application to the Imperial College Research Ethics Committee.

At the beginning of each interview, interviewers showed credentials as research assistants at the University of London, informed respondents that their answers were anonymous and would remain strictly confidential, and that all responses and data were going to be treated statistically and used for the purposes of scientific research only. Informed consent by respondents was then given at the beginning of each interview.

### Sample

The survey was conducted in the field by the researchers involved in the paper. The borough of Hammersmith and Fulham was chosen for the location of the field survey because it is a transport hub in Central West London, and hosts many offices and several

1  
2  
3 major business centres. The four interviewers went to different public locations within the  
4 borough (underground stations, high street and residential areas) at different times during  
5 the day (early morning, midday and in the evening) and in different days of the week  
6 (including weekends). By covering different times and locations within the borough, we  
7 aimed at being able to approach both working and non-working members of the public.  
8 During the surveys in the field, the interviewers approached every third male and third  
9 female that would pass by them.

10  
11 Sample size calculations were based on the intended objective to look at the correlation  
12 coefficient between the likelihood of using the websites on the one hand, and a typical  
13 survey response, on the other. The minimum sample size to test the null hypothesis of no  
14 significant correlation between these two variables was calculated given the most  
15 conservative assumption that the correlation coefficient between the variables in the  
16 population was in the region of 0.2 (a “low” effect size, the variance of one variables  
17 accounting for just 4% of the variance of the other). Under the assumptions that all  
18 variables are normally distributed, a bi-directional test (both positive and negative  
19 correlation were expected) with 95% significance level reaches a standard 80% power  
20 level at a minimum sample of n=200 subjects.<sup>11</sup> We thus targeted a sample size of 200  
21 respondents. The envisaged target was then readily achieved, since only 68 subjects who  
22 were initially approached refused to take part to the survey, with a final response rate of  
23 74%.

### 30 Statistical analysis

31  
32 We have carried a multiple regression analysis which aims to explore the determinants of  
33 i) being either aware or not of doctor rating websites; and ii) of the individual intention  
34 of using these websites in the future.

35  
36  
37 The dependent variable in the first case is modeled as a binary variable (*Awareness*)  
38 taking values 1 or 0 for the respondents who reported to be aware or unaware of the  
39 websites, respectively. The second dependent variable is instead modeled as a discrete  
40 ordered variable (*IntentionToUse*) taking values 1, 2, and 3 for subjects reporting to be  
41 ‘not likely’, ‘quite likely’, and ‘likely’ to use the websites in the future, respectively.

42  
43  
44 The explanatory variables ( $X_i$ ) include the variables described in Table 1, namely:  
45 individual socio-demographic characteristics; a set of variables on the characteristics of  
46 the healthcare providers that the respondents consider important for making their  
47 decisions on where to receive health care; a set of variables on the sources of information  
48 that are important in making decisions about where to receive health care; two dummy  
49 variables that capture whether the patient’s gender and age are the same, or within a  
50 comparable range, respectively, than the gender and age of her GP; a set of variables that  
51 describe the respondents’ feelings about their relation with their doctor; a variable  
52 indicating the level of participation of the respondents in their GPs’ decisions; a set of  
53 variables on patients’ satisfaction with the level of choice in their healthcare decisions; a  
54 dummy variable controlling for whether the subjects had access to internet at home or at  
55 work; a variable on awareness of the existence of doctor-rating websites; and a variable on  
56 whether the subject always asks to see the same GP (see Table 1 for variables’ details).

The choice of the explanatory variables was further informed by the bivariate correlation analysis reported in Table 2 in the Appendix.

We employed a binary logistic and an ordered logistic model to fit the *Awareness* and the *IntentionToUse* discrete variables, respectively, to ensure a reasonable comparability between the empirical results obtained for the two set of regressions. The two models, in fact, only differ in the number of values that the dependent variables can take, while the underlying structure of the error terms follows the same standardized logistic distribution. The logistic specification is particularly appealing because its results can be readily expressed in terms of odds ratio. We have, however, conducted a robustness check by replicating the multiple regression analysis using the alternative binary and ordered probit specifications, which assume a Gaussian error term and present results in terms of estimated coefficients instead of odds ratio. The two set of regressions provide consistent estimates and results which are qualitatively fully aligned. Results of the probit specifications are available, upon request, from the authors.

All the regression analysis has been conducted using STATA v.11.

## RESULTS

### Descriptive statistics

Descriptive statistics of all the dependent and independent variables for the resulting sample of respondents to our survey are provided in detail in Table 1, and here we briefly report their main aspects. As a result of the convenience sampling, our resulting sample consisted in 141 workers (ten of which reported to be currently unemployed), 33 students, nine officially unemployed and six retired subjects. Eleven respondents did not report their working status.

~~As common in field surveys of this type, the convenience sampling tended to over-represent respondents who were currently not working, or were at home, and thus had time to fill out the questionnaire: the proportion of subjects who were not currently working, as given by the sum of the respondents who reported to be unemployed, retired, or students, indeed amounts to 29% of the sample.~~

~~Related to that, it turned out that 9.5% of the respondents in our sample were currently unemployed, compared to only 5% from the Census data for the borough. The relatively higher proportion of unemployed respondents may also be a result of the convenience sampling method. Moreover, an unemployment rate higher than the one documented in the 2001 Census survey was largely expected, due to the consequences of the economic and financial crisis after 2007.~~

~~Comparing the sample with the Census data for the borough the mean age of our sample was slightly older than that for the borough (39.57 years compared to 35.2 years).<sup>15</sup> Our sample however was closer to the national mean age of 38.5 years. The range of ages seems to show a positive skew, with a greater frequency of people aged 40 years and under. This is consistent with the 2001 census data for Hammersmith and Fulham which showed the borough contained a larger proportion of young people aged 20-29 (23.8%) than the rest of England (12.66%) (ONS, 2001).<sup>15</sup> Age is an important demographic to~~

consider when analysing our results as age has been shown to be important in internet usage.<sup>14</sup>

The mean age of our sample was of 39.57. The range of ages seems to show a positive skew, with a greater frequency of people aged 40 years and under. Age is an important demographic to consider when analysing our results as age has been shown to be important in internet usage.<sup>10</sup> From the sample, 54.44% were female, 48.79% of 'White British' ethnicity and 28.99% non white respondents.

Also, the sample had a slightly greater proportion of females than the borough (54.44% to 52% respectively), and a lower proportion of 'White British' ethnicity (48.79% compared to 58% for the borough).<sup>15</sup> This is also significantly lower than figures for England, White British accounting for 87% of the population.<sup>15</sup> The sample contained 28.99% non white respondents. This is higher than the 2001 census data for Hammersmith and Fulham which was 22% and significantly higher than the figures for England, showing non white ethnic groups accounting for 9% of the total population.<sup>15</sup> Our sample, therefore, allows controlling for high heterogeneity in ethnic background even with a limited sample size.

The majority of actively working respondents reported an income within the £15-35,000 bracket. Income is an important variable to control for in the analysis, as previous literature found that patients using the Internet were more educated and had higher incomes.<sup>12+6</sup>

Our sample had a high percentage of people with higher level qualifications: 46.24% of the sample had a university degree and 27.96% had a postgraduate degree. This is reflective of Hammersmith and Fulham, where 45% of the population have a qualification of degree level or higher, a figure which is significantly higher than in England, where only 19.8% have a degree or higher qualification.<sup>15</sup>

## Results on awareness

Only 29 of our respondents were aware of the doctor-rating websites they were asked about. This corresponds to less than 15% of our sample, indicating that the awareness and, consequently, usage of these online sources is still quite limited in the UK, although significantly higher than what the previous studies have shown.<sup>6</sup>

In Table 2 we present the set of bivariate correlations between the fact of being aware of the websites and each of the variables collected in the survey. As it can be seen, there is positive correlation between having an internet access, or being aware of the NHS Choose and Book system, and being aware of the doctor rating websites. Age exhibits a negative correlation, while the gender concordance with the GP, shows a positive correlation. Positive correlations with the awareness of doctor rating websites also hold for respondents who think that those websites are important sources of information, or who see accessibility and financial performances of hospitals important factors in making decisions where to seek healthcare.

[Table 2 in here]

A slow uptake of online ratings has also been reported in the US, a more market oriented health system. It is indicative that only 6% of Americans were aware of Hospital

~~Compare, the quality reporting website maintained by the Centres for Medicare and Medicaid Services (CMS).<sup>17</sup>~~

In Table 3 we present the estimate results of four different specifications of the binary logistic regression for the dependent variable *Awareness* with different sets of regressors, which are presented in terms of the odds ratio, together with the standard errors, and levels of significance.

[Table 3 in here]

Among the demographic factors, age and ethnicity are the only significant variables. Older individuals are less likely to be aware of the rating websites, which does not constitute a surprise, as they are usually less familiar with the use of internet in general. Moreover, in most specifications, white British and white non-British respondents appear less likely to be aware of the websites.

Among the broader socio-demographic factors, only income is sometimes (marginally) significant, pointing to the fact that respondents with higher reported levels of income tend to be less aware of the websites, while neither education or gender turn out to be significant predictors of awareness.

Looking at the characteristics of the providers that respondents consider important in making their decisions on where to receive healthcare, in one specification the reputation of the doctor has a strong positive effect, while both clinical and financial performance rates of the providers show negative significant effects. Thus, the respondents who consider the reputation of the doctor important in deciding where to receive care are more likely to be aware of the rating websites, while this is less often the case for respondents putting a higher weight on financial or clinical performance ratings, ~~perhaps signalling that those respondents may be more familiar with alternative sources of information.~~

Concerning the sources of information, in one specification respondents who consider the hospital statistics important in deciding where to receive care, turn out to be more likely of being aware of the rating websites, with an effect which is particularly significant and quite remarkable in terms of odds ratio. ~~This may signal the possible existence of 'complementary' effects between the two sources of information, according to which individuals who give importance to hospital statistics are also more likely to actively seek for doctor rating websites.~~

Furthermore, although in one specification the respondents who feel that their GPs spend a sufficient time in their consultation are less likely to be aware of the internet rating websites, both the statistical significance and the estimated odds ratio do not appear robust across specifications. Although all other variables on doctor-patient relationship were not significant, whenever included among the regressors, the gender match between the GP and the patient predicts higher awareness of the website ratings, with a noticeable effect as evident by the reported value of the odds ratio.

From those that were aware of the existence of doctor-rating websites only 6 have reported to have used these websites. In light of this low usage rate, and of the consequent limitations of conducting statistical estimations with very little variation in the dependent

1  
2  
3 outcomes, we have thus focused the rest of the analysis on the determinants of the  
4 intention to use, rather than actual usage of, doctor rating websites.  
5  
6  
7

### 8 **Results on the likelihood to use online rating websites**

9  
10 In Table 2 we present the set of bivariate correlations between the intention to use the  
11 doctor rating websites and each of the variables collected in the survey. As it can be  
12 noticed, there is a positive correlation between having internet access, and being aware of  
13 the doctor rating websites. Both the age and the gender concordance with the GP show a  
14 positive correlation with the intention to use. Positive correlations with the willingness to  
15 use doctor rating websites also hold for respondents who think that those websites, or  
16 hospital statistics, are important sources of information. Also the fact that respondents  
17 believe that online rating is a reliable measure is clearly correlated with the intention to  
18 use them. Finally, positive correlations also hold for respondents who feel that their doctor  
19 has time to dedicate to them, or who see several aspects of healthcare providers - such as  
20 reputation, clinical and financial performances, waiting lists, accessibility – as important  
21 factors when making decisions where to seek healthcare.  
22

23  
24 In Table 4 we present the estimate results of six different specifications of the ordered  
25 logistic regression for the dependent variable *IntentionToUse* with different sets of  
26 regressors, which are presented in terms of the odds ratio, together with the standard  
27 errors, and levels of significance.  
28

29 **[Table 4 in here]**  
30

31 Concerning socio-demographic variables, it turns out that white British, as well as  
32 respondents who reported income in higher brackets, said they were less likely to use  
33 doctor-rating websites. Moreover, we do not find any effect of education, age and gender  
34 of the respondents on the likelihood of their intention to use (the results of the  
35 specifications including the age and gender variables are not reported in the table for the  
36 sake of space but are available from the authors upon request).  
37  
38

39 Looking at the characteristics of the healthcare providers that respondents perceived as  
40 important while making decisions where to receive healthcare, our data suggest that those  
41 who consider clinical performance and doctor reputation (in most specifications) as  
42 important factors, are more likely to use doctor-rating websites. These results are  
43 consistent with the nature of the information provided in these websites. Also, and quite  
44 intuitively, subjects who consider the familiarity with their doctor an important factor to  
45 decide where to seek healthcare, tend to be less likely to intend to use websites.  
46  
47

48 Concerning the role of the different sources of information on the decisions of where to  
49 seek healthcare, respondents who see published hospital statistics as important sources of  
50 information are more likely to use the rating websites. On the other hand, and  
51 interestingly, those for whom GP advice is an important source of information for decision  
52 making are less likely to use doctor-rating websites.  
53  
54

55 Also the nature of the doctor-patient relationship seems to play a key role in explaining  
56 whether respondents intend to use online rating websites. First, patients with GPs of the  
57 same gender tend to be more likely to use the websites. Second, respondents for whom the  
58 doctor is able to listen to them, and who perceive the nature of the relationship with their  
59  
60

GP as friendly, also tend to be more likely to use the websites. Third, respondents who feel that their doctor explains things clearly are less likely to use online rating websites. Fourth, it also transpires that the more autonomy patients have in their healthcare decisions, the more likely they are to be willing to use the rating websites.

Finally, concerning, the interaction between levels of satisfaction for the healthcare services within the NHS, and the intention to use doctor-rating websites, it is interesting to note that those that have reported to be more satisfied with the level of choice of GP, and with the amount of choice of the hospital to receive outpatient appointments, are more likely to use these websites. On the other hand, the respondents that are more satisfied with the level of choice of treatments are less likely to use the websites.

## **DISCUSSION**

In this section we briefly discuss our main findings on i) the representativeness of our sample; ii) the determinants of the level of awareness and usage of doctor rating websites; iii) the actual usage of the websites; and iv) the determinants of the intention to use them in the future.

### **The sample**

As common in field surveys of this type, the convenience sampling tended to over-represent respondents who were currently not working, or were at home, and thus had time to fill out the questionnaire: the proportion of subjects who were not currently working, as given by the sum of the respondents who reported to be unemployed, retired, or students, indeed amounts to 29% of the sample.

Related to that, it turned out that 9.5% of the respondents in our sample were currently unemployed compared to only 5% from the Census data for the borough.

The relatively higher proportion of unemployed respondents may also be a result of the convenience sampling method. Moreover, an unemployment rate higher than the one documented in the 2001 Census survey was largely expected, due to the consequences of the economic and financial crisis after 2007.

Comparing the sample with the Census data for the borough the mean age of our sample was slightly older than that for the borough (39.57 years compared to 35.2 years).<sup>13</sup> Our sample however was closer to the national mean age of 38.5 years. The range of ages seems to show a positive skew, with a greater frequency of people aged 40 years and under. This is consistent with the 2001 census data for Hammersmith and Fulham which showed the borough contained a larger proportion of young people aged 20-29 (23.8%) than the rest of England (12.66%) (ONS, 2001).<sup>13</sup>

Also, the sample had a slightly greater proportion of females than the borough (54.44% to 52% respectively), and a lower proportion of 'White British' ethnicity (48.79% compared to 58% for the borough).<sup>13</sup> This is also significantly lower than figures for England, White British accounting for 87% of the population.<sup>13</sup> The sample contained 28.99% non white respondents. This is higher than the 2001 census data for Hammersmith and Fulham



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

which was 22% and significantly higher than the figures for England, showing non white ethnic groups accounting for 9% of the total population.<sup>13</sup> Our sample, therefore, allows controlling for high heterogeneity in ethnic background even with a limited sample size.

Our sample had a high percentage of people with higher level qualifications: 46.24% of the sample had a university degree and 27.96% had a postgraduate degree. This is reflective of Hammersmith and Fulham, where 45% of the population have a qualification of degree level or higher, a figure which is significantly higher than in England, where only 19.8% have a degree or higher qualification.<sup>13</sup>

### **Awareness and actual usage**

Only 15% of our sample were aware of the existence of these websites, indicating that the awareness and, consequently, usage of these online sources is still quite limited in the UK, although significantly higher than what the previous studies have shown.<sup>5</sup>

A slow uptake of online ratings has also been reported in the US, a more market-oriented health system. It is indicative that only 6% of Americans were aware of Hospital Compare, the quality reporting website maintained by the Centres for Medicare and Medicaid Services (CMS).<sup>14</sup>

Concerning the low reported rate of active usage of doctor rating websites, the finding is not too surprising given that the survey was done among the general population: the reason why many more respondents were aware of the online ratings than did actually use it may simply be because those subjects did not actually need to see a doctor. Generally speaking, the finding is consistent with previously reported levels of usage in the UK. In particular, a study by the Kings Fund<sup>5</sup> that explored the information sources used by patients in making decisions about where to receive care, found that only 4% of the patients used the *NHS Choices* website, with the majority instead drawing information from their own experiences (41%), advice from GP (36%), advice from friends and family (18%), and other websites (1%). Similarly, a national survey on patients' choice by the Department of Health found that the *NHS Choices* website was only used by 5% of respondents.<sup>6</sup>

The proportion of active users in our survey is also consistent with evidence from the US on the limited usage of doctor rating websites. Gao et al.<sup>8</sup> analysed 386,000 national ratings from 2005-2010 in the US and showed that only 1 out of 6 physicians among those included in the study had received some rating. Lagu, Hannon, Rothberg et al.<sup>7</sup> also reported a low average number of ratings per physician.

### **Intention to use**

The results that show that white British and respondents who reported income in higher brackets said that they were less likely to use doctor-rating websites, is partly in contrast to what found by the previous literature<sup>12,15,16</sup> and can signal that white British subjects and respondents with higher self-reported income may feel less in need of checking online doctor ratings, perhaps because they may also have private, or employer-paid, health insurance schemes, or because they are in the position of directly accessing alternative sources of information through their networks of acquaintances. Another possible explanation may be that white British individuals may trust less information that exists online and they have more concerns about confidentiality issues as shown in a study

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

among different socio-economic groups in the US by Brodie et al.<sup>17</sup> As the estimated effect of these variables appear to be robust across all empirical specifications, these findings seem to suggest that online doctor-rating websites are likely to be particularly attractive to subjects with non-white British ethnicity and less favoured economic background.

On the other hand, the lack of statistical significance in the ordered logit estimates, seems to suggest that while age can be a significant factor in explaining the awareness of Internet for health information, it is not significantly explaining the intention to use doctor-rating websites once subjects are made aware of their existence. The analogous lack of significance for the respondents' gender, on the other hand, does not support the view that women in the UK may be more likely to use patient sources of information and rating websites, although they have been found to desire patient choice more than men (69% to 56%).<sup>9</sup> Both results differ from the findings from the literature. The literature has shown that socio-demographic characteristics are major determinants of usage of online health information. In particular women and younger adults are more active 'online health information seekers'.<sup>10,18-21</sup>

Education has also been found to determine usage of online and offline health information. Cotton and Gupta<sup>16</sup> and Diaz et al,<sup>12</sup> carried out research into the characteristics of online and offline health information seekers and showed that individuals who are less educated were shown to less likely to be users of online health information.

Therefore even though, according to our findings, intentions to use do not differ across different socio demographic groups, actual usage may be greatly determined by access rather than intentions to use, with the former substantially differing according to socio-economic and demographic characteristics. That is, there may exist income- or age-related barriers to actual access that prevent individuals from using doctor rating sites even though their intentions to use them are similar.

From the perspective of the doctor-patient relationship, the finding that patients with GPs of the same gender tend to be more likely to use the websites is of particular interest, and it is consistent with the analogous effect found for the likelihood of being aware of those websites. Considered together these findings point to the possible explanation that the doctor and the Internet may sometimes be seen by patients as "complementary", rather than alternative, information channels.<sup>15</sup> This interpretation is further confirmed by the finding that respondents for whom the doctor is able to listen to them, and who perceive the nature of the relationship with their GP as friendly, also tend to be more likely to use the websites.

The doctor-patient gender concordance, in fact, has often been reported in the literature as a factor associated with higher patient satisfaction with the consultation as well as better outcomes.<sup>22</sup> If we interpret the gender match variable as an indication of satisfaction with the consultation, our finding indicates that being aware of and the intention to use the doctor-rating websites is not necessarily the result of a poor consultation. Instead, the Internet and the doctor are likely to be seen as complementary, rather than alternative, information channels.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Nevertheless for those that put a higher weight on financial or clinical performance ratings this is less the case, perhaps signalling that those respondents may be more familiar with alternative sources of information.

On the other hand, there may be other dimensions in the patient-doctor relationship which seem to rather point to a “substitute” relationship with information on the Internet. For instance, the fact that respondents who feel that their doctor explains things clearly are less likely to use online rating websites, suggests that when they are generally more satisfied with the feedback provided by their doctor they are less concerned about finding about alternative doctors and compare them with their current GP.

This result on a “substitute relationship” is consistent with previous evidence by Diaz and colleagues<sup>12</sup> that found that 11% of their respondents said they would rather use the Internet ‘instead of seeing or speaking with their doctors’, and that 59% of respondents ‘did not discuss information with their doctors’. It also seems in line with the study by McMullan<sup>15</sup> that indicates that patients who become dissatisfied with the information provided to them by the health professionals are more likely to seek confirmation of the information given and additional information on the Internet.

As for the other aspects of the patient-doctor relationship, the finding that the more autonomous patients are in their healthcare decisions, the more willing they are to use the rating websites is also consistent with previous evidence: a study by McMullan<sup>15</sup>, for instance, reports that patients would seek health information before a consultation ‘to manage their own healthcare independently’. These may be the type of people who are ‘more likely to be health-oriented’ or ‘health conscious’, and therefore be more proactive in consultations.<sup>23</sup>

Moreover, the positive association between willingness to use doctor rating websites and levels of satisfaction with the level of choice of GP, and of outpatient appointments in the hospital, can be considered as reinforcing the above discussed interpretation that some dimensions of the doctor-patient relationship may be “complementary” with online information. For instance, patients who are more satisfied with their GP because they feel the latter is more friendly and empathic may also be more likely to engage more actively with health and healthcare information more generally. These results, together with the finding that the respondents who are more satisfied with the level of choice of treatments are less likely to use the websites, suggest that the choice of doctors and providers may be seen as only instrumental for the choice of treatment, and therefore respondents that are happy with treatment choice levels are less likely to shop around for different doctors’ opinions.

### -General discussion

Overall, our evidence on the determinants of intention to use is broadly consistent with recent findings from the literature. Indeed, a study by Stevenson and colleagues<sup>24</sup> shows that although patients use the Internet increasingly more, they show no intention of doing so with the aim of disrupting the existing balance of roles during the doctor-patient consultation. They all mentioned the Internet as an additional resource of health and healthcare information. Other evidence suggests that patients with hypertension who search for more information on the Internet, in addition to that they receive from their doctor, may be more engaged in their treatment, and therefore more willing to adhere to medication prescribed by them.<sup>25</sup>

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Our findings that online information can be used not only as “substitute” but also, and perhaps mainly, as “complementary” to several dimensions of the doctor-patient relationship do not seem to entail any particular evidence suggesting that online ratings may put in danger the doctor-patient relationship, an important aspect which has been raised in the literature.<sup>26,27</sup>

The “complementarity” findings, in particular, seem consistent with the evidence from the US which shows that the vast majority of the reviews by patients are generally rather positive.<sup>7,8,28</sup> Taken together, this evidence can be seen as providing little support to the related concern that the likeliest to use online ratings and enter actual comments may be the most disgruntled patients.<sup>29</sup>

On a related topic, concerns have been expressed about the ability of online ratings to truly reflect the quality of care. A recent UK study, however, demonstrated a strong relationship between the ratings reported online and more objective measures of clinical quality such as mortality and infection rates,<sup>30</sup> while another study showed that online ratings were associated with ratings derived from a traditional paper-based survey.<sup>31</sup> Online ratings, thus, do not seem to provide systematically biased or misleading information regarding the health care that patients receive, at least not more than a traditional survey would do. Consistently with this evidence, our results seem to support the idea that patients may see online ratings as a supplementary information base to be used in support of direct interaction with their doctor, which remains the most significant and reliable information channel.<sup>32</sup>

More generally, the evidence provided by our study confirms that the actual usage of doctor-rating websites in the UK remains particularly low. In our sample only 29 respondents out of 200 were aware of the existence of the patient rating websites. Among these, however, only 6 subjects reported they were actually using those websites.

These figures are substantially in line with previous evidence brought forward from the literature for the UK.<sup>5,6</sup> The fact that even in the US, a more market-oriented health system, the use of similar sites is not much higher may suggest that the slow uptake in the UK cannot be attributed only to the early stage of the “choice” model. Considered together these results may pose serious concerns on the reasons and consequences of the lack of patient awareness and usage of online health related information.

Previous studies in the US have reported a number of reasons behind this slow uptake, including i) the preference for more traditional information channels, such as recommendations by family and friends; ii) the lack of time; and iii) in many cases the fact that people do not recognise that the quality of care may vary.<sup>27</sup>

Our study confirms that not only awareness of rating websites is still limited among the general public in the UK, but awareness and willingness to use per se do not seem a sufficient condition to guarantee active usage. This poses a double challenge from a clinician and health policy perspective.

In fact, on the one hand, the documented correlation between online ratings and other measures of healthcare quality, including survey-based ratings and clinical quality indicators,<sup>30,31</sup> necessarily requires that patients have already gone through three

preliminary hurdles, namely i) being aware of, ii) having effective access to, and ii) being active users of the doctor rating websites. If the ultimate goal is indeed the continuous enhancement of healthcare quality, the effective removal of this double hurdle is likely to become the next priority to guarantee the full spread of online rating website.

On the other hand, while appropriate online and offline informational campaigns are likely to overcome the first hurdle, thus effectively raising patients' awareness of online ratings as a potential source of information on provider quality, informational campaigns alone can fail to grant effective access and effectively trigger changes in behaviour. Alike in several other health contexts, in fact, 'nudging' behaviour may be difficult as a mere consequence of accessing more information.

If this is the case, other avenues should be explored to increase the active usage of rating websites by patients who are already aware of them. For instance, the evidence brought forward by the present study confirms the importance of the doctor-patient relationship as a factor determining individuals' awareness of and willingness to use online ratings<sup>27,33-36</sup> and suggests that tailored behavioural interventions based on the doctor-patient relationship have the potential to help patients to overcome this last hurdle and actively engage with online ratings.

### Limitations of the study

The convenience field survey was considered the most appropriate administration mode to involve a sample of respondents from the general population. An online survey, in fact, by exclusively reaching the segment of active internet users, would have failed to address the main goal of the study, whether the users of doctor-rating websites are fairly representative of the general public

However, While dictated by practical issues, the convenience sampling is a limitation of the study, and tends to over-represent respondents who are currently not employed, such as unemployed, retired and students. Also the fact that the study was conducted in only one borough of London limits the possibility to immediately generalise the findings to the broader UK population.

In an attempt to make such limitations of smaller concern to enhance the external validity and generalisability of the analysis, we have i) chosen a borough which comprises a mix of both affluent and deprived neighbourhoods from heterogeneous ethnic backgrounds; ii) conducted surveys in the field at different public locations and at different times of the day and of the week to approach both working and non-working members of the public; and iii) controlled for a wide range of socio-demographic measures in the statistical analysis.

### CONCLUSIONS

This study brings forward direct evidence suggesting that the awareness and actual usage of doctor-rating websites in the UK remains particularly low. In a sample of the general public from a borough of London only 29 respondents out of 200 were aware of the

1  
2  
3 existence of the patient rating websites, and only 6 reported to be actually using those  
4 websites.

5  
6 By collecting a broad range of information on the socio-demographic characteristics of the  
7 respondents, their views and perceptions of the most important aspects of healthcare  
8 quality, patient choice, and doctor-patient relationship, the study also explicitly explores  
9 the determinants of respondents' awareness of the doctor ratings websites, and of their  
10 intention to use the sites in the future.

11  
12 Among other results, the statistical analysis provides evidence that the GP-patient gender  
13 concordance is associated with higher awareness of, and intention to use, the websites,  
14 while respondents who feel that their GP is a valuable source of clear information, and  
15 who are more satisfied with the level of choice of healthcare treatments, are less likely to  
16 use online rating websites.

17  
18 The existence of both "substitute" and "complementary" effects between the doctor-  
19 patient and the Internet information channels is not at all conflicting. In fact, they both  
20 indicate that the level of concordance achieved during the consultation is likely to define  
21 whether or not individuals will seek for further information channels, such as the Internet.

22  
23 When the outcome of a consultation does not satisfy the patient, the use of Internet fills  
24 the gap of information needs. The intention to use online doctor-rating websites in this  
25 case also indicates that these patients are likely to look at these websites with the aim of  
26 seeking for another clinician. Individuals who are satisfied with their GPs may also search  
27 these websites, but more as an additional information channel as they seem keener to  
28 engage more actively with health and healthcare information in general.

29  
30 The findings of our study thus contribute also to the wider debate on the inter-  
31 relationships between Internet usage and the doctor-patient relationship.<sup>7,27,28,33-36</sup> The  
32 argument, sometimes addressed by the previous literature, that information on the Internet  
33 can threaten the trust relationship and the balance of roles between doctors and patients,  
34 seems a concern which is not supported by our evidence. If any, a potential challenge to  
35 the doctor-patient relation can only affect the patients who already feel dissatisfied with  
36 the ability of their doctor to listen to them and provide them enough information regarding  
37 their condition, or with the level of their choice for healthcare treatments.

38  
39 The above, however, can hardly be seen as a serious threat by those who advocate a  
40 greater choice by patients. On the contrary, if the latter is indeed a priority in the health  
41 policy agenda, online information on healthcare providers should be seen as a challenging  
42 opportunity to enhance patients' choice in healthcare, and public engagement with health  
43 information, especially for the less favoured segments of the population. Indeed, our  
44 findings suggest that subjects of non-white background and with lower income are more  
45 willing to use online ratings.

46  
47 Finally, our study highlights that subjects who use doctor rating websites are unlikely to  
48 be representative of the overall patients' pool. In particular, they tend to over-represent  
49 opinions from young, non-white British, medium-low income patients who are not  
50 satisfied with their choice of healthcare treatments. Accounting for differences in the  
51 users' characteristics is important when interpreting results from doctor-rating sites and  
52 when informing interventions that aim at enhancing the public engagement with health  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 information on the Internet, and the representativeness of the users who seek and provide  
4 feedback online.  
5  
6  
7

8 **Data sharing:** technical appendix, statistical code and dataset available from the  
9 corresponding author at [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk). Consent for data sharing was not  
10 obtained but the presented data are anonymised and risk of identification is low.  
11

12 All authors had full access to all the data in the study and take responsibility for the  
13 integrity of the data and the accuracy of the data analysis.  
14

15  
16  
17 **Funding:** this piece of work has not received any specific funding.  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## REFERENCES

1. [Department of Health. The NHS Plan: a plan for investment, a plan for reform. Crown 2000. Cm 4818-I.](#)
2. [Department of Health. The NHS Improvement Plan: Putting people at the heart of public services. London: The Stationery Office 2004. Cm 6268.](#)
3. [Department of Health. Creating a patient-led NHS: Delivering the NHS Improvement Plan. London: The Stationery Office 2005.](#)
4. [Department of Health. High Quality Care For All: NHS Next Stage Review final report. London: The Stationery Office 2008. Cm 7432.](#)
5. [Dixon A, Robertson R, Appleby J, et al. Patient Choice. London: The Kings Fund 2010 \[http://www.kingsfund.org.uk/publications/patient\\\_choice.html\]\(http://www.kingsfund.org.uk/publications/patient\_choice.html\)](#)
6. [Department of Health. Report of the National Patient Choice Survey, England. Crown 2008.](#)
7. [Lagu T, Hannon NS, Rothberg MB, et al. Patients' Evaluations of Health Care Providers in the Era of Social Networking: An Analysis of Physician-Rating Websites. J Gen Intern Med 2010;\*\*25\*\*\(9\):942-6.](#)
8. [Gao GG, McCullough JS, Agarwal R et al. A Changing Landscape of Physician Quality Reporting: Analysis of Patients' Online Ratings of Their Physicians Over a 5-Year Period. J Med Internet Res 2012; \*\*14\*\*\(1\):e.38.](#)
9. [Appleby J, Alvarez A. Public Responses to NHS Reform. In British Social Attitudes Survey 22nd Report, London: Sage Publications 2005.](#)
10. [Ybarra M, Suman M. Help seeking behavior and the Internet: A national survey. Int J Med Inform 2006;\*\*75\*\*\(1\): 29-41.](#)
11. [Cohen J. Statistical Power Analysis for the Behavioural Sciences. Academic Press, New York and London 1969.](#)
12. [Diaz JA, Griffith RA, Ng JJ, et al. Patients' use of the Internet for medical information. J Gen Intern Med 2002;\*\*17\*\*\(3\): 180-185.](#)
13. [Office for National statistics. 2001 Census: Key Statistics. 2001. Available from: <http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.doa=3&b=276755&c=hammersmith&d=13&e=15&g=334516&i=1001x1003x1004&m=0&r=1&s=1273150763921&enc=1&dsFamilyId=47>](#)
14. [Kaiser Family Foundation, 2008 Update on consumers' views of patient safety and quality information. Kaiser Family Foundation. <http://www.kff.org/kaiserpolls/posr101508pkg.cfm>](#)
15. [McMullan M. Patients using the Internet to obtain health information: how this affects the patient-health professional relationship. Patient Educ Couns 2006;\*\*63\*\*\(1-2\): 24.](#)
16. [Cotten SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. Soc Sc Med 2004;\*\*59\*\*\(9\): 1795-1806.](#)
17. [Brodie M, Flournoy RE, Altman DE, et al. Health information, the Internet, and the digital divide. Health Affairs 2000; \*\*19\*\*\(6\): 255-265.](#)
18. [Health on the Net Foundation. HON's fourth survey on the use of the Internet for medical and health purposes, 1999.](#)
19. [Fox L, Rainie J, Horrigan A, et al. The online healthcare revolution: How the web helps Americans take better care of themselves, Pew Internet and American Life Project, 2000.](#)
20. [Baker L, Wagner TH, Singer S, et al. Use of the Internet and e-mail for health care information. JAMA 2003; \*\*289\*\*\(18\): 2400-6.](#)



- 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
  - 10
  - 11
  - 12
  - 13
  - 14
  - 15
  - 16
  - 17
  - 18
  - 19
  - 20
  - 21
  - 22
  - 23
  - 24
  - 25
  - 26
  - 27
  - 28
  - 29
  - 30
  - 31
  - 32
  - 33
  - 34
  - 35
  - 36
  - 37
  - 38
  - 39
  - 40
  - 41
  - 42
  - 43
  - 44
  - 45
  - 46
  - 47
  - 48
  - 49
  - 50
  - 51
  - 52
  - 53
  - 54
  - 55
  - 56
  - 57
  - 58
  - 59
  - 60
21. [Wald HS, Dube CE, Anthony DC. Untangling the Web-The impact of internet use on health care and the physician-patient relationship. Patient Educ Couns 2007; 68\(3\): 218-224.](#)
22. [Bertakis KD. The influence of gender on the doctor-patient interaction. Patient Educ Couns 2009;73\(3\): 356-60.](#)
23. [Dutta-Bergman MJ. Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. J Med Internet Res 2004;6\(2\): e15.](#)
24. [Stevenson FA, Kerr C, Murray E, et al. Information from the Internet and the doctor-patient relationship: the patient perspective – a qualitative study. BMC Fam Pract 2007;8: 47.](#)
25. [Stavropoulou C. Perceived information needs and non-adherence: evidence from Greek patients with hypertension. Health Expect 2012;15\(2\): 187-196.](#)
26. [McCartney M. Will doctor rating sites improve the quality of care? BMJ 2009; 338b 1033.](#)
27. [Lagu T and Lindenauer PK. Putting the public back in public reporting of health care quality. JAMA 2010;304\(15\):1711-1712.](#)
28. [López A, Detz A, Ratanawongsa N, et al. What Patients Say About their Doctors Online: A Qualitative Content Analysis. J Gen Intern Med 2012;27\(6\):685-92.](#)
29. [Wachter B. The patient will rate you now. 2012 Available at: <http://community.the-hospitalist.org/2012/03/19/the-patient-will-rate-you-now>](#)
30. [Greaves F, Pape U, King D, et al. Associations between internet-based patient ratings and conventional surveys of patient experience in the English NHS: an observational study. BMJ Qual Saf 2012; 21: 600-605.](#)
31. [Greaves F, Pape UJ, King D, et al. Associations between Web-based patient ratings and objective measures of hospital quality. Arch Intern Med 2012;172: 435-436.](#)
32. [Coulter A, Ellins J, Swain D, et al. Assessing the quality of information to support people in making decisions about their health and healthcare. Picker Institute Europe. 2006 Nov. Retrieved from \[http://www.pickereurope.org/assets/content/pdf/Project\\\_Reports/Health-information-quality-web-version-FINAL.pdf\]\(http://www.pickereurope.org/assets/content/pdf/Project\_Reports/Health-information-quality-web-version-FINAL.pdf\)](#)
33. [Nwosu CR, Cox BM. The impact of the Internet on the doctor-patient relationship. Health Informatics Journal 2000;6\(3\): 156-161.](#)
34. [Broom A. Virtually He@lthy: The Impact of Internet Use on Disease Experience and the Doctor-Patient Relationship. Quality Health Research 2005;15\(3\): 325-345.](#)
35. [Gorindo T. Web searching for information about physicians. JAMA 2008; 300\(2\): 213.](#)
36. [Malone M, Mathes L, Dooley J et al. Health information seeking and its effect on the doctor-patient digital divide. Journal of Telemedicine and Telecare 2005; 11 \(Supl.1\): S1:25–28.](#)

**Appendix**  
**Table 1 Variable description and descriptive statistics**

Variable	Obs	Mean	Std. Dev
<b>Awareness (<i>Awareness</i>) (0=no, 1=yes)</b>	200	0.142	0.350
<b>Intention to use (<i>IntentionToUse</i>)</b>	199	2.136	0.743
<b>Not likely</b>	43		
<b>Quite likely</b>	86		
<b>Likely</b>	70		
<b>Important factors in making decisions (1=not important at all, 5=very important)</b>			
<b>Waiting lists (<i>HC_Waiting</i>)</b>	198	3.818	1.165
<b>Rates of hospital-acquired complications (<i>HC_HospComp</i>)</b>	188	3.761	1.193
<b>Clinical performance (<i>HC_Clinical_Performance</i>)</b>	189	4.037	1.136
<b>Closeness to home (<i>HC_CloseHome</i>)</b>	200	3.683	1.265
<b>Familiarity with the doctor (<i>HC_Familiarity</i>)</b>	194	3.237	1.306
<b>Financial performance of the hospital (<i>HC_FinPerform</i>)</b>	191	2.387	1.164
<b>Reputation of the doctor (<i>HC_GP_Reputation</i>)</b>	199	3.980	1.137
<b>Accessibility and parking facilities (<i>HC_Access</i>)</b>	192	2.656	1.321
<b>Past experience with the provider (<i>HC_PastExp</i>)</b>	193	3.544	1.311
<b>Important sources of information in making decisions (1=not important at all, 5=very important)</b>			
<b>GP advice (<i>SI_GP_Advice</i>)</b>	198	4.071	1.030
<b>Published hospital statistics (<i>SI_HospStat</i>)</b>	183	2.934	1.193
<b>Online doctor rating websites (<i>SI_DoctorRating</i>)</b>	178	2.315	1.204
<b>Personal experiences in the past (<i>SI_PastExp</i>)</b>	192	4.234	1.004
<b>Feedback from family/friends (<i>SI_Family</i>)</b>	194	4.149	0.924
<b>I feel the doctor...</b>			
<b>...listens (0=no, 1=yes) (<i>DOC_Listens</i>)</b>	200	0.575	0.496
<b>...has time (0=no, 1=yes) (<i>DOC_Time</i>)</b>	200	0.410	0.493
<b>...explains (0=no, 1=yes) (<i>DOC_Explains</i>)</b>	200	0.555	0.498
<b>...is friendly (0=no, 1=yes) (<i>DOC_Friend</i>)</b>	200	0.445	0.498
<b>... Is someone I can trust (0=no, 1=yes) (<i>DOC_Trust</i>)</b>	200	0.550	0.499
<b>I feel that online rating is a reliable measure (1=very unreliable, 5=very reliable) (<i>Reliable</i>)</b>	141	2.759	1.055
<b>How actively do you participate with your GP in making decisions (<i>Participation</i>)</b>	193		
<b>My doctor always makes decisions for me</b>	2		
<b>I like to know the options available but still let my doctor decide for me</b>	13		
<b>My doctor and I make the decisions together</b>	25		
<b>I make decisions for myself, after considering the advice of my GP</b>	65		
<b>I always make my own decisions, independently of the advice of my GP</b>	75		
<b>I make decisions with my parents/spouse/relatives</b>	13		
<b>Satisfied with the current level of choice of... (1 = strongly dissatisfied, 5 = strongly satisfied)</b>			
<b>...GP (<i>SAT_C_GP</i>)</b>	173	3.451	1.138
<b>...hospital (<i>SAT_C_Hosp</i>)</b>	152	3.493	1.055
<b>...doctor (<i>SAT_C_Doc</i>)</b>	139	3.252	1.022
<b>...treatment (<i>SAT_C_Treatment</i>)</b>	148	3.554	0.928
<b>...time spent (<i>SAT_C_Time</i>)</b>	168	3.179	1.123

<b>Ethnicity</b>				
<b>White British (0=no, 1=yes) (WhiteBritish)</b>	200	0.488	0.501	
<b>White Other (0=no, 1=yes) (WhiteNonBritish)</b>	200	0.222	0.417	
<b>Highest level of educational attainment* (Education)</b>				
<b>1 if GCSE</b>	12			
<b>2 if A-Level/BTEC/Vocational</b>	36			
<b>3 if University undergraduate degree</b>	86			
<b>4 if Postgraduate Degree</b>	52			
<b>Age (years) (Age)</b>	199	39.572	16.083	
<b>Gender (Gender)</b>				
<b>Female (=1)</b>	112			
<b>Male (=0)</b>	88			
<b>Income (Income)</b>				
<b>0</b>	40			
<b>&lt;£15000 but &gt;0</b>	27			
<b>£15,000-£35,000</b>	36			
<b>£35,000-55,000</b>	22			
<b>£55,000-£75,000</b>	14			
<b>£75,000-£95,000</b>	7			
<b>&gt;£95,000</b>	14			
<b>Doctor-patient concordance</b>				
<b>Age Match (=1 if doctor and patient belong to the same age bracket; =0 otherwise) (AgeMatch)</b>	200	0.333	0.473	
<b>Gender Match (=1 if patient and doctor are of same gender; =0 otherwise) (GenderMatch)</b>	200	0.444	0.498	

Table 2: Bivariate Correlations

	IntentionToUse	Awareness		IntentionToUse	Awareness
<b>IntentionToUse</b>	1		<b>DOC_Friend</b>	0.0127 (0.8599)	-0.0984 (0.1667)
<b>Awareness</b>	0.0846 (0.2359)	1	<b>DOC_Trust</b>	-0.0288 (0.6899)	-0.0388 (0.5863)
<b>HC_Waiting</b>	0.1617** (0.025)	0.016 (0.8236)	<b>Participation</b>	0.0412 (0.5678)	0.0189 (0.7911)
<b>HC_HospComp</b>	0.1474** (0.0465)	-0.0033 (0.9643)	<b>SAT_C_GP</b>	-0.0419 (0.591)	0.122 (0.1108)
<b>HC_Clinical_Performance</b>	0.2146*** (0.0034)	-0.0784 (0.2849)	<b>SAT_C_Hosp</b>	-0.003 (0.9715)	0.1024 (0.2111)
<b>HC_CloseHome</b>	-0.0623 (0.3848)	-0.0998 (0.1587)	<b>SAT_C_Doc</b>	-0.0348 (0.6909)	0.137 (0.1077)
<b>HC_Familiarity</b>	-0.0078 (0.9153)	-0.0752 (0.2986)	<b>SAT_C_Treatment</b>	-0.0157 (0.8526)	0.0932 (0.2598)
<b>HC_FinPerform</b>	0.1253** (0.0884)	0.1435** (0.0482)	<b>SAT_C_Time</b>	-0.0239 (0.7632)	0.0541 (0.4878)
<b>HC_GP_Reputation</b>	0.2020*** (0.0047)	-0.016 (0.8234)	<b>CB_AWARE</b>	-0.0381 (0.5972)	0.2997*** (0)
<b>HC_Access</b>	0.0451 (0.5399)	0.1196* (0.0992)	<b>CB_Use</b>	0.0996 (0.1651)	0.054 (0.4477)
<b>HC_PastExp</b>	0.0978 (0.182)	-0.0244 (0.7369)	<b>WEB_Access</b>	0.2054*** (0.0041)	0.1197* (0.0923)
<b>SI_GP_Advice</b>	0.1054 (0.1457)	0.0163 (0.8202)	<b>AgeMatch</b>	0.1373* (0.0532)	0.0695 (0.3234)
<b>SI_HospStat</b>	0.2937*** (0.0001)	0.1159 (0.1192)	<b>GenderMatch</b>	0.2077*** (0.0032)	0.1472** (0.0357)
<b>SI_DoctorRating</b>	0.3759*** (0)	0.1240* (0.099)	<b>WhiteBritish</b>	-0.0429 (0.5477)	-0.0662 (0.3468)
<b>SI_PastExp</b>	0.0563 (0.4455)	-0.0803 (0.2696)	<b>WhiteNonBritish</b>	-0.0017 (0.9809)	-0.0853 (0.2252)
<b>SI_Family</b>	0.1215* (0.0958)	-0.0511 (0.4804)	<b>Income</b>	0.012 (0.8818)	-0.1219 (0.1246)
<b>Reliable</b>	0.3429*** (0)	-0.0311 (0.7153)	<b>Education</b>	-0.0103 (0.8913)	0.0023 (0.9757)
<b>DOC_Listens</b>	0.0629 (0.3824)	-0.0888 (0.2122)	<b>Gender</b>	0.0315 (0.6614)	-0.0087 (0.9029)
<b>DOC_Time</b>	0.1565** (0.0289)	-0.0117 (0.87)	<b>Age</b>	-0.1081 (0.1344)	-0.1918*** (0.0068)
<b>DOC_Explains</b>	0.0968 (0.1784)	0.0152 (0.8314)			

P-Values in parentheses. \* p<.10, \*\* p<.05, \*\*\* p<.01

Table 3 Odds Ratios for the Binary Logit explaining the awareness of doctor rating websites.

	Model 1	Model 2	Model 3	Model 4
<b>Awareness</b>				
<b>Age</b>	0.953*	0.931**		
	(0.0239)	(0.0307)		
<b>Gender</b>	1.347	1.819		
	(0.648)	(1.092)		
<b>WhiteBritish</b>	0.595	0.841	0.401	0.0150**
	(0.309)	(0.524)	(0.276)	(0.0292)
<b>WhiteNonBritish</b>	0.273*	0.398	0.228*	0.00399**
	(0.198)	(0.324)	(0.200)	(0.00957)
<b>Education</b>	1.105	1.396	1.279	1.682
	(0.341)	(0.534)	(0.438)	(1.399)
<b>Income</b>	0.952	0.943	0.708*	0.228*
	(0.157)	(0.169)	(0.132)	(0.180)
<b>HC_HospComp</b>		1.173	1.353	2.237
		(0.366)	(0.442)	(1.825)
<b>HC_Clinical_Performance</b>		0.691	0.527	0.0342*
		(0.245)	(0.207)	(0.0609)
<b>HC_Familiarity</b>		0.710	0.756	2.564
		(0.170)	(0.202)	(2.096)
<b>HC_GP_Reputation</b>		1.409	1.611	13.57*
		(0.509)	(0.599)	(19.95)
<b>HC_FinPerform</b>		0.921	0.963	0.0783**
		(0.264)	(0.297)	(0.0919)
<b>HC_Access</b>		1.112	1.088	0.917
		(0.236)	(0.242)	(0.444)
<b>SI_GP_Advice</b>		1.173	0.922	1.115
		(0.350)	(0.290)	(0.718)
<b>SI_HospStat</b>		1.291	1.390	49.75**
		(0.410)	(0.477)	(87.28)
<b>SI_Family</b>		0.935	0.614	0.146
		(0.361)	(0.273)	(0.186)
<b>SI_PastExp</b>		0.762	1.202	0.284
		(0.275)	(0.499)	(0.343)
<b>SI_DoctorRating</b>		0.938	0.933	1.859
		(0.261)	(0.271)	(1.119)
<b>DOC_Listens</b>			0.416	1.182
			(0.324)	(2.244)
<b>DOC_Time</b>			1.289	0.00185**
			(0.950)	(0.00580)
<b>DOC_Explains</b>			2.533	0.885
			(1.799)	(1.658)
<b>DOC_Friend</b>			0.752	15.62
			(0.535)	(30.63)
<b>DOC_Trust</b>			0.930	3.173
			(0.583)	(4.555)
<b>Participation</b>			1.080	3.346
			(0.298)	(2.835)
<b>AgeMatch</b>			2.247	269.4*
			(1.429)	(791.0)
<b>GenderMatch</b>			3.153*	32.77*
			(1.867)	(61.36)
<b>SAT_C_GP</b>				3.020
				(2.948)
<b>SAT_C_Hosp</b>				0.802
				(1.134)

<b>SAT_C_Doc</b>	2.794
	(3.411)
<b>SAT_C_Treatment</b>	1.818
	(2.311)
<b>SAT_C_Time</b>	0.735
	(0.550)
<b>Same GP</b>	0.641
	(0.766)

Exponentiated coefficients; Standard errors in parentheses

\* p<.10, \*\* p<.05, \*\*\* p<.01

For peer review only

Table 4 Odds Ratios for the Ordered Logit explaining the likelihood to use doctor rating websites

	m1	m2	m3	m4	m5	m6
<b>AgeMatch</b>	1.974 (2.377)	2.561 (2.953)	2.000 (1.965)	2.782 (2.613)	1.051 (0.818)	0.946 (0.729)
<b>GenderMatch</b>	18.42* (30.24)	12.03* (17.75)	10.45** (12.33)	10.39** (10.54)	16.67*** (15.48)	14.83*** (13.17)
<b>Awareness</b>	0.0531 (0.108)	0.0505 (0.0971)	0.0964 (0.149)	0.0758** (0.0985)	0.159* (0.176)	0.147* (0.152)
<b>HC_Clinical_Performance</b>	9.289* (11.84)	7.659* (8.241)	5.560** (4.759)	3.401* (2.253)	4.395** (2.653)	4.985*** (2.734)
<b>HC_Familiarity</b>	0.359 (0.287)	0.468 (0.282)	0.371* (0.220)	0.414* (0.206)	0.355** (0.147)	0.351*** (0.141)
<b>HC_GP_Reputation</b>	2.328 (1.980)	2.827 (2.106)	3.608* (2.542)	4.410** (2.753)	2.903** (1.374)	2.776** (1.260)
<b>SI_GP_Advice</b>	0.170* (0.173)	0.223 (0.206)	0.238** (0.167)	0.283** (0.176)	0.344** (0.186)	0.396* (0.193)
<b>SI_HospStat</b>	14.26** (18.84)	13.74** (15.60)	7.220*** (5.008)	6.550*** (4.200)	5.371*** (2.932)	5.133*** (2.703)
<b>SI_DoctorRating</b>	1.596 (1.636)	1.067 (0.958)	1.424 (0.851)	1.461 (0.770)	2.245** (0.835)	2.312** (0.876)
<b>Reliable</b>	6.181 (7.691)	8.682* (9.969)	6.492** (4.993)	7.586*** (5.561)	4.457*** (2.351)	4.061*** (2.003)
<b>DOC_Listens</b>	141.9* (424.8)	51.44 (126.4)	44.20* (90.99)	27.05** (41.26)	22.03** (28.29)	22.98** (28.34)
<b>DOC_Explains</b>	0.00690* (0.0183)	0.00680** (0.0148)	0.00509** (0.0105)	0.00695*** (0.0124)	0.0120*** (0.0171)	0.0124*** (0.0169)
<b>DOC_Friend</b>	12.88 (29.23)	8.375 (14.65)	16.48** (22.41)	19.66*** (22.45)	8.718** (8.047)	7.781** (6.896)
<b>Participation</b>	5.473* (5.255)	5.818* (5.410)	5.171** (3.664)	4.162** (2.687)	2.349* (1.126)	2.228* (1.036)
<b>SAT_C_GP</b>	17.03* (27.58)	8.038 (10.23)	6.593* (6.659)	5.410** (4.048)	4.692** (2.889)	4.377*** (2.484)
<b>SAT_C_Hosp</b>	21.93** (33.71)	22.86** (30.90)	30.01*** (33.63)	34.38*** (35.43)	17.95*** (15.52)	11.11*** (7.578)
<b>SAT_C_Treatment</b>	0.0515** (0.0764)	0.0561** (0.0794)	0.111** (0.106)	0.147** (0.125)	0.145** (0.111)	0.111*** (0.0788)
<b>WhiteBritish</b>	0.0137* (0.0318)	0.0409* (0.0738)	0.0542** (0.0782)	0.0539** (0.0690)	0.0909** (0.0890)	0.105** (0.0973)
<b>Income</b>	0.416* (0.190)	0.382** (0.162)	0.449** (0.154)	0.513** (0.154)	0.476*** (0.129)	0.462*** (0.120)
<b>SAT_C_Doc</b>	0.242 (0.468)	0.243 (0.374)	0.148* (0.161)	0.135* (0.144)	0.427 (0.321)	
<b>SI_PastExp</b>	0.670 (0.787)	0.590 (0.650)	0.535 (0.576)	0.551 (0.250)		
<b>Education</b>	0.486 (0.526)	0.583 (0.554)	0.683 (0.443)	0.610 (0.328)		
<b>HC_Access</b>	1.046 (0.659)	1.124 (0.678)	1.241 (0.564)	1.347 (0.565)		
<b>HC_PastExp</b>	1.030 (0.578)	0.914 (0.487)	0.930 (0.397)			
<b>SI_Family</b>	1.208 (1.357)	1.305 (1.484)	1.439 (1.458)			
<b>DOC_Time</b>	1.223 (2.118)	2.099 (3.261)	2.594 (3.547)			

<b>DOC_Trust</b>	0.153	0.608	0.460			
	(0.327)	(0.983)	(0.629)			
<b>WEB_Access</b>	1.122	0.558	0.483			
	(4.345)	(1.763)	(0.918)			
<b>HC_Waiting</b>	0.960	1.097				
	(0.806)	(0.846)				
<b>HC_HospComp</b>	1.200	0.790				
	(0.929)	(0.540)				
<b>HC_CloseHome</b>	0.930	0.790				
	(0.726)	(0.516)				
<b>HC_FinPerform</b>	0.610	0.692				
	(0.621)	(0.588)				
<b>SAT_C_Time</b>	1.449	1.530				
	(1.441)	(1.280)				
<b>WhiteNonBritish</b>	0.742	0.493				
	(1.790)	(1.041)				
<b>CB_AWARE</b>	1.422					
	(3.158)					
<b>CB_Use</b>	83.93					
	(354.7)					
<b>_cut1</b>	9454769.9**	2474784.8**	3131224.6**	2460471.3***	10470831.2***	13892352.4***
	(63313549.3)	(15197453.2)	(18256829.6)	(13260544.4)	(45550085.5)	(59299449.7)
<b>_cut2</b>	7.05660e+09*	1.22556e+09***	1.14387e+09***	674102348.3***	1.42570e+09***	1.60379e+09***
	**					
	(5.66892e+10)	(8.86204e+09)	(7.69789e+09)	(4.20283e+09)	(7.17551e+09)	(7.78799e+09)



# QUESTIONNAIRE

---

## Imperial College Business School



We would be very grateful for your cooperation in completing this questionnaire. It should take around **10 minutes** to complete.

The data collected will contribute towards a study into the healthcare service in the UK. There are currently major changes taking place in the NHS, in an effort to improve the choice and quality of services available to the public. One of these changes has been the introduction of a system called “Choose & Book” which gives you the option to choose which hospital you wish to go to for your outpatient appointment, following a GP referral. This is a study into how individuals regard these new choices and how they make decisions about where to receive care. In particular, we are studying the awareness and use of online doctor rating websites as a source of information for patients. These doctor rating websites allow patients to rate their doctors and provide feedback based on their own experiences. The ratings can then be used by others when deciding where to receive health care.

All data collected will remain strictly confidential. The study is being conducted by researchers from Imperial College London and King’s College London. If you would like to be informed of the results of this study, please contact [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk).

## SECTION A

[www.iwantgreatcare.com](http://www.iwantgreatcare.com)

[www.NHSchoices.co.uk](http://www.NHSchoices.co.uk)

[www.patientopinion.co.uk](http://www.patientopinion.co.uk)

[www.privatehealth.co.uk](http://www.privatehealth.co.uk)

**Q1. Are you aware of any of the above online doctor rating websites or any other doctor rating websites?**

Yes                      No  (if No, skip ahead to Section C)

Other (please specify).....

**Q2. How did you find out about these sites?**

Family/Friends                       Doctor

The Media                       Other (please specify).....

## SECTION B

**Q3. Have you used these websites in the past to look at doctor/hospital ratings?**

Yes                       No  (if No, skip ahead to Section C)

**Q4. What specialty of doctor have you searched for in the past in these websites?**

.....

**Q5. When do you use these websites?**

On a regular basis                       Only before/after an appointment  Rarely

**Q6. In the past, has the information on these websites influenced your choice of doctor/hospital?**

Yes                       No

**Q7. If Yes, was this based on positive or negative information on the websites?**

Positive information                       Negative information

**Q8. How easy to use do you find the sites?** Please circle the most appropriate number on a scale of 1 to 5 (1=very easy, 5=very difficult)

1            2            3            4            5

## SECTION C

**Q9. Which of the following factors are important to you in making decisions about where to receive healthcare?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important), or 'none of these'.

Waiting lists	1	2	3	4	5
Rates of hospital-acquired complications	1	2	3	4	5
Clinical performance rating	1	2	3	4	5
Closeness to home	1	2	3	4	5
Familiarity with the doctor	1	2	3	4	5
Financial performance of the hospital	1	2	3	4	5
Reputation of the doctor	1	2	3	4	5
Accessibility and parking facilities	1	2	3	4	5
Past experience with the provider	1	2	3	4	5
None of these					<input type="checkbox"/>

**Q10. Which of the following sources of information are important in making decisions about where to receive health care?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important).

GP advice	1	2	3	4	5
Published hospital statistics	1	2	3	4	5
Online doctor rating website	1	2	3	4	5
Personal experiences in the past	1	2	3	4	5
Feedback from family/friends	1	2	3	4	5

**Q11. To what extent do you think that the online rating of doctors by patients is a reliable measure of a doctor's performance?** Please circle the most appropriate number on a scale of 1 to 5 (1=very unreliable, 5=very reliable)

1      2      3      4      5                      Not sure     

**Q12. If you have not used these websites before, how likely do you feel you will use them in the future?**

Not likely                       Quite likely                       Likely

## SECTION D

**Q13. These websites are based on patient input. Individuals can provide feedback based on their own experiences. Considering this, when would you be most likely to contribute to the online site?** Tick all that apply.

- Every time
- After particularly positive experiences only
- After particularly negative experiences only
- After both positive and negative experiences
- Never
- Not sure

**Q14. Out of the following what would be your motive for any contributions that you make to an online doctor rating site?** Tick all that apply.

- I would not contribute to these websites
- To inform other patients
- To improve standards of care in the NHS
- As a method of complaint
- In appreciation of a doctor's service
- Not sure

## SECTION E

**Q15. Which of the following attributes would you use to describe your GP?** Tick all that apply.

- I feel my doctor listens to my problems
- I feel my doctor spends enough time with me in each consultation
- I feel my doctor explains things clearly
- I feel my doctor is sociable and friendly

- 1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13
- I feel that I can trust my doctor's opinions  
 None of the above

14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29

**Q16. How actively do you participate with your GP in making decisions about your health care generally?** Tick the single most appropriate.

- My doctor always makes decisions for me  
 I like to know the options available but still let my doctor decide for me  
 My doctor and I make the decisions together  
 I make decisions for myself, after considering the advice of my GP  
 I always make my own decisions, independently of the advice of my GP  
 I make decisions with my parents/spouse/relatives

30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

**Q17. Within your GP practice do you always want to see the same GP for an appointment?**

- I always request to see the same GP  
 I don't mind which doctor I see.

**Q18. Where is choice more important to you in the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 =of no importance, 5 =very important) or select 'not sure'.

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of appointment time (for primary & secondary care)	1	2	3	4	5	Not sure	<input type="checkbox"/>

**Q19. How satisfied are you with the current level of choice of where you can receive health care within the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 = strongly dissatisfied, 5 = strongly satisfied) or select 'not sure'.

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>

Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of appointment time (for primary & secondary care)	1	2	3	4	5	Not sure	<input type="checkbox"/>

**Q20. Choose and Book is a new NHS system which gives you the option to choose which hospital you wish to go to for your outpatient appointment. Are you aware of this system?**

Yes                      No

**Q21. Have you used this Choose and Book system in the past?**

Yes                       No

**Q22. If you have used the Choose & Book system in the past, how actively have you participated in making decisions about where to receive care? Tick the single most appropriate.**

- I have never used Choose & Book
- My doctor always makes decisions for me
- I like to know the options available but still let my doctor decide for me
- My doctor and I make the decisions together
- I make decisions for myself, after considering the advice of my GP
- I always make my own decisions, independently of the advice of my GP
- I make decisions with my parents/spouse/relative

**Q23. When is the choice of hospital important to you, for outpatient referrals? Tick all that apply.**

- Routine outpatient consultation
- Day-case procedure/surgery
- Major surgery
- None of these

---

## SECTION F

**Q24. Do you have access to a computer/laptop with internet access, at home or at work?**

Yes                       No

**Q25. Have you used the internet in the past to search for health information?**

Yes  No

**Q26. If you do not use online doctor rating websites, which of the following factors stops you from doing so? Tick all that apply**

- I'm too busy to have the time to use them
- The sites are not a reliable source of information
- It is difficult to interpret the information provided
- I already have enough information from other sources to make choices
- I don't have access to the internet
- I did not know these websites existed
- I have never needed to use these websites

**Q27. What other internet websites involving ratings do you use? Tick all that apply.**

- Shopping websites (e.g. Amazon)
- Holiday websites (e.g. TripAdvisor)
- Car insurance websites (e.g. Compare The Market)
- Restaurants/venue websites (e.g. ViewLondon)
- Film websites (e.g. Rottentomatoes)
- Other (please specify).....
- I don't use any rating websites.

**Q28. What methods of rating do you feel are a useful form of feedback in these websites? Tick all that apply.**

- Star-rating out of 5
- Percentage scores
- Thumbs Up/Down
- Written comments from patients/users
- No preference

## SECTION G

We remind you that all personal data collected will remain confidential and is collected for academic purposes.

**Q29. What is your age? .....**

**Q30. What is your gender?**

Male  Female

**Q31. How would you describe your ethnicity?**

<input type="checkbox"/>	White – British	<input type="checkbox"/>	Other Asian – non-Chinese
<input type="checkbox"/>	White – Others	<input type="checkbox"/>	Black Caribbean

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

**Q32. What is your postcode? .....**

**Q33. How many other individuals do you live with? .....**

**Q34. Do you live with your parents?**

- Yes                       No

**Q35. What is/was your profession? .....**

- Unemployed                       Retired

**Q36. What is your level of pre-tax income?**

- 0
- <£15000 but >0                       £15,000-£35,000
- £35,000-55,000                       £55,000-£75,000
- £75,000-£95,000                       >£95,000

**Q37. What is your highest level of educational attainment?**

	GCSE		Other vocational degree
	A-Level		University degree
	BTEC		Postgraduate degree

**Q38. In the last year how many times have you had an outpatient hospital appointment?**

- 0 times                       1-3 times
- 4-5 times                       More than 5 times

**Q39. What is the sex of your GP?**

- Male                       Female

**Q40. How old is your GP?**

- <30 years
- 30-50 years
- >50 years

**Q41. What is the ethnicity of your GP?**

	White – British		Other Asian – non-Chinese
	White – Others		Black Caribbean



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

Q42. I cannot answer Q39, Q40, Q41 because I don't always see the same GP.

**This is the end of the questionnaire, thank you for your time.**



For peer review only

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1-2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2- 3
<b>Introduction</b>			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	8
		(b) Describe any methods used to examine subgroups and interactions	8
		(c) Explain how missing data were addressed	8
		(d) If applicable, describe analytical methods taking account of sampling strategy	NA
		(e) Describe any sensitivity analyses	NA
<b>Results</b>			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	8-11
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	18-23
		(b) Report category boundaries when continuous variables were categorized	NA
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	11-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	11
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	12

\*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).



**Who is More Likely to Use Doctor-Rating Websites, and Why?**  
**A cross sectional study in London.**

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2012-001493.R3
Article Type:	Research
Date Submitted by the Author:	03-Oct-2012
Complete List of Authors:	Galizzi, Matteo; London School of Economics, LSE Health Miraldo, Marisa; Imperial College London, Business School Stavropoulou, Charitini; University of Surrey, Health Care Management Desai, Mihir; Imperial College London, Medicine Jayatunga, Jeevana; Imperial College London, Medicine Joshi, Mitesh; Imperial College London, Medicine Parikh, Sunny; King's College London, Medicine
<b>Primary Subject Heading</b>:	Health economics
Secondary Subject Heading:	Health policy
Keywords:	HEALTH ECONOMICS, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, World Wide Web technology < BIOTECHNOLOGY & BIOINFORMATICS

SCHOLARONE™  
 Manuscripts

Only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stavropoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

**Declaration:** All authors have completed the Unified Competing Interest form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

**Copyright statement:** The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, a worldwide licence to the Publishers and its licensees in perpetuity, in all forms, formats and media (whether known now or created in the future), to i) publish, reproduce, distribute, display and store the Contribution, ii) translate the Contribution into other languages, create adaptations, reprints, include within collections and create summaries, extracts and/or, abstracts of the Contribution, iii) create any other derivative work(s) based on the Contribution, iv) to exploit all subsidiary rights in the Contribution, v) the inclusion of electronic links from the Contribution to third party material where-ever it may be located; and, vi) licence any third party to do any or all of the above.

## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stavropoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

### Article summary

#### Article focus:

- To explore the awareness of the existence of doctor-rating websites and their usage among a sample of respondents from London.
- To understand the main predictors of what makes people willing to use doctor-ratings websites.

#### Key messages:

- The share of actual users of doctor-rating websites is quite low.
- Subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The doctor-patient relationship is a significant predictor of patients' intention to use doctor-rating websites.

#### Strength and Limitations:

- Our study contributes to the literature of online health information where evidence on the determinants of people's willingness to use doctor-rating websites is limited.
- The main limitation of the study is that we use a convenience sample from one borough of London, UK and therefore results cannot be immediately generalised to the UK population.

### Abstract

**Objectives:** To explore the extent to which doctor-rating websites are known and used among a sample of respondents from London. To understand the main predictors of what makes people willing to use doctor-ratings websites.

**Design:** A cross-sectional study.

**Setting:** The Borough of Hammersmith and Fulham, London, England.

**Participants:** 200 individuals from the borough.

**Main outcome measures:** The likelihood of being aware of doctor-rating websites and the intention to use doctor-rating websites.

**Results:** The use and awareness of doctor-rating websites is still quite limited. White British subjects, as well as respondents with higher income are less likely to use doctor-rating websites. Aspects of the doctor-patient relationship also play a key role in explaining intention to use the websites. The doctor has both a "complementary" and "substitute" role with respect to Internet information.

**Conclusions:** Online rating websites can play a major role in supporting patients' informed decisions on which health care providers to seek advice from, thus potentially fostering patients' choice in health care. Subjects who seek and provide feedback on doctor-ranking websites, though, are unlikely to be representative of the overall patients' pool. In particular, they tend to over-represent opinions from non white British, medium-

low income patients who are not satisfied with their choice of the healthcare treatments and the level of information provided by their GP. Accounting for differences in the users' characteristics is important when interpreting results from doctor-rating sites.

### Key messages

- The share of actual users of doctor-rating websites is quite low.
- Subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The GP-patient gender concordance is associated with higher intention to use the websites.
- Subjects who feel that their GP explains things clearly and is a valuable source of clear information, are less likely to use online rating websites.
- Subjects who feel that they are more satisfied with the level of choice of healthcare treatments are less likely to use online rating websites.

<sup>1</sup> London School of Economics, LSE Health and Centre for the Study of Incentives in Health

<sup>2</sup> Imperial College Business School

<sup>3</sup> University of Surrey

<sup>4</sup> Imperial College School of Medicine

<sup>5</sup> King's College London

\*Corresponding author: Marisa Miraldo. Email: [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk)

## INTRODUCTION

In recent years, both the NHS Plan<sup>1</sup> and the NHS Improvement Plan<sup>2</sup>, set out the changes required for the English NHS to become more patient-focussed. Greater patient involvement in the running of the NHS has gone hand in hand with the policymakers' drive to improve the quality of public healthcare services. The 'bottom-up' approach to a more patient-centred NHS has typically focused on three main areas: i) giving users more choice and personalisation; ii) making funding respond to users' choices; and iii) engaging users through greater involvement.<sup>3</sup> Lord Darzi's 2008 report "High Quality Care For All - The Next Stage Review"<sup>4</sup> acknowledged that improvements to the NHS should focus on improving the quality of services, and that the best way of achieving this would be to ensure that services are locally responsive to the needs of the community, for instance, by empowering providers and patients as decentralised decision-makers in order to foster a culture of continuous quality improvement and innovation.

Websites, such as the *NHS Choices* and *Dr Foster Intelligence*, have been developed with the explicit aim of informing patients about the services that the NHS provides and therefore allowing a better choice of physicians and treatments. In principle, doctor-rating websites can have a profound impact on public involvement and patients' choice, as they enable patients to make more informed decisions on where to seek healthcare, and thus to engage more often in active choices concerning their health. In practice, however, relative little evidence is available on whether, and to what extent, doctor-rating websites are actually known and actively used in the UK.

A study by the Kings Fund<sup>5</sup> explored the information sources used by patients in making decisions about where to receive care. Only 4% of the patients used the NHS Choices website, with the majority instead drawing information from their own experiences (41%), and advice from GP (36%). Similarly, a national survey on patients' choice by the Department of Health found that the NHS Choices website was only used by 5% of respondents.<sup>6</sup> These figures are consistent with the evidence from the US where usage of doctor rating websites is still quite low.<sup>7,8</sup> Moreover, very little is known about the profile of individuals who are more likely to make active use of these sites. Appleby and Alvarez<sup>9</sup> found that women in England desire patient choice more than men (69% to 56%), suggesting that women may also be more likely to use patient sources of information such as rating sites. This is in line with findings from the US where women and younger adults are more active 'online health information seekers'.<sup>10</sup>

The aim of this study is to contribute to fill these gaps by providing more direct evidence on, first, the extent to which doctor ratings websites are known and used among a sample of respondents in a borough of London; and, second, the most significant predictors of the fact that people are willing to use doctor-ratings websites.

## METHODS

We conducted a self-administered survey to assess the extent and the determinants of i) the awareness of the existence of doctor-ratings websites; ii) the level of actual usage of those websites; iii) the intention to use doctor-ratings websites in the future.



## Questionnaire design

Prior to the data collection a pilot study was conducted. The aim of the pilot was to gain an understanding of the practicalities associated with giving out questionnaires and collecting responses. After listening to feedback from pilot respondents, and looking at results from the pilot study, several changes were made to make the questionnaire easier to understand. The changes related to content, phrasing and ordering of questions.

The content of the final questionnaire was based on findings from the preliminary literature review and was designed in a number of sections (see Appendix for full questionnaire). In particular, section A focuses on the awareness of online rating websites, while section B assesses actual usage of online rating websites. Section C measures the willingness to use the online rating websites in the future, and explores which aspects of the healthcare providers and which sources of information are perceived as being important factors in making decisions about where to receive healthcare. Section D assesses the individual contribution to the online rating sites, while section E focuses on aspects of the doctor-patient relationship and attitudes and dimensions of patient choice. Finally section F controls for internet usage, while section G collects a broad range of socio-demographic characteristics.

Closed questions were used, worded in a manner easy to understand. A limited number of responses were provided, either with binary options (e.g. yes or no), or with a numerical Likert scale ranging from 1 to 5, with a further option for “*Not sure*”.

A list of variables with a brief description is discussed in the Statistical analysis section and is summarised in Table 1 in the Appendix.

## Ethical approval, informed consent and confidentiality of responses

We completed the checklist for research ethics approval from Imperial College London. As interviews were intended to be conducted in public places among respondents from the general population, the study involved no risk or harm of any type to respondents, no link with clinical data was expected to take place, and no incentives were going to be paid to respondents, the study fitted all the criteria in the first stage checklist with no further formal application to the Imperial College Research Ethics Committee.

At the beginning of each interview, interviewers showed credentials as research assistants at the University of London, informed respondents that their answers were anonymous and would remain strictly confidential, and that all responses and data were going to be treated statistically and used for the purposes of scientific research only. Informed consent by respondents was then given at the beginning of each interview.

## Data Collection

The survey was conducted in the field by the researchers involved in the paper. The borough of Hammersmith and Fulham was chosen for the location of the field survey because it is a transport hub in Central West London, and hosts many offices and several major business centres. The four interviewers went to different public locations within the borough (underground stations, high street and residential areas) at different times during the day (early morning, midday and in the evening) and in different days of the week

(including weekends). By covering different times and locations within the borough, we aimed at being able to approach both working and non-working members of the public. During the surveys in the field, the interviewers approached every third male and third female that would pass by them.

Sample size calculations were based on the intended objective to look at the correlation coefficient between the likelihood of using the websites on the one hand, and a typical survey response, on the other. The minimum sample size to test the null hypothesis of no significant correlation between these two variables was calculated given the most conservative assumption that the correlation coefficient between the variables in the population was in the region of 0.2 (a “low” effect size, the variance of one variables accounting for just 4% of the variance of the other). Under the assumptions that all variables are normally distributed, a bi-directional test (both positive and negative correlation were expected) with 95% significance level reaches a standard 80% power level at a minimum sample of  $n=200$  subjects.<sup>11</sup> We thus targeted a sample size of 200 respondents. The envisaged target was then readily achieved, since only 68 subjects who were initially approached refused to take part to the survey, with a final response rate of 74%.

### Statistical analysis

Besides a correlation analysis, we have carried a multiple regression analysis which aims to explore the determinants of i) being either aware or not of doctor rating websites; and ii) the individual intention of using these websites in the future.

The dependent variable in the first case is modeled as a binary variable (*Awareness*) taking values 1 or 0 for the respondents who reported to be aware or unaware of the websites, respectively. The second dependent variable is instead modeled as a discrete ordered variable (*IntentionToUse*) taking values 1, 2, and 3 for subjects reporting to be ‘not likely’, ‘quite likely’, and ‘likely’ to use the websites in the future, respectively.

The explanatory variables ( $X_i$ ) include the variables described in Table 1, namely: individual socio-demographic characteristics; a set of variables on the characteristics of the healthcare providers that the respondents consider important for making their decisions on where to receive health care; a set of variables on the sources of information that are important in making decisions about where to receive health care; two dummy variables that capture whether the patient’s gender and age are the same, or within a comparable range, respectively, than the gender and age of her GP; a set of variables that describe the respondents’ feelings about their relation with their doctor; a variable indicating the level of participation of the respondents in their GPs’ decisions; a set of variables on patients’ satisfaction with the level of choice in their healthcare decisions; a dummy variable controlling for whether the subjects had access to internet at home or at work; a variable on awareness of the existence of doctor-rating websites; and a variable on whether the subject always asks to see the same GP (see Table 1 for variables’ details). The choice of the explanatory variables was further informed by the bivariate correlation analysis reported in Table 2 in the Appendix.

We employed a binary logistic and an ordered logistic model to fit the *Awareness* and the *IntentionToUse* discrete variables, respectively, to ensure a reasonable comparability between the empirical results obtained for the two set of regressions. The two models, in fact, only differ in the number of values that the dependent variables can take, while the underlying structure of the error terms follows the same standardized logistic distribution. The logistic specification is particularly appealing because its results can be readily expressed in terms of odds ratio. We have, however, conducted a robustness check by replicating the multiple regression analysis using the alternative binary and ordered probit specifications. The two set of regressions provide consistent estimates and results which are qualitatively fully aligned. Results of the probit specifications are available, upon request, from the authors.

All the regression analysis has been conducted using STATA v.11.

## RESULTS

### The sample and descriptive statistics

Descriptive statistics of all the dependent and independent variables for the resulting sample of respondents to our survey are provided in detail in Table 1, and here we briefly report their main aspects.

Our sample consisted of 200 subjects. Comparing it with the Census data for the borough the mean age of our sample was slightly older than that for the borough (39.57 years compared to 35.2 years).<sup>12</sup> Our sample however was closer to the national mean age of 38.5 years. The range of ages seems to show a positive skew, with a greater frequency of people aged 40 years and under. This is consistent with the 2001 census data for Hammersmith and Fulham which showed the borough contained a larger proportion of young people aged 20-29 (23.8%) than the rest of England (12.66%).<sup>12</sup>

Also, the sample had a slightly greater proportion of females than the borough (54.44% to 52% respectively), and a lower proportion of 'White British' ethnicity (48.79% compared to 58% for the borough).<sup>12</sup> This is also significantly lower than figures for England, White British accounting for 87% of the population.<sup>12</sup> The sample contained 28.99% non white respondents. This is higher than the 2001 census data for Hammersmith and Fulham which was 22% and significantly higher than the figures for England, showing non white ethnic groups accounting for 9% of the total population.<sup>12</sup> Our sample, therefore, allows controlling for high heterogeneity in ethnic background even with a limited sample size.

Regarding working status, 141 individuals were workers (ten of which reported to be currently unemployed), 33 students, 9 officially unemployed and 6 retired. Eleven respondents did not report their working status. The proportion of subjects who were not currently working, as given by the sum of the respondents who reported to be unemployed, retired, or students, indeed amounts to 29% of the sample. The majority of actively working respondents reported an income within the £15-35,000 bracket.

Our sample had a high percentage of people with higher level qualifications: 46.24% of the sample had a university degree and 27.96% had a postgraduate degree. This is reflective of Hammersmith and Fulham, where 45% of the population have a qualification

of degree level or higher, a figure which is significantly higher than in England, where only 19.8% have a degree or higher qualification.<sup>12</sup>

### Results on awareness

Only 29 of our respondents were aware of the doctor-rating websites they were asked about and only 6 reported to have used them.

In Table 2 we present the set of bivariate correlations between the fact of being aware of the websites and each of the variables collected in the survey. As it can be seen, there is positive correlation between having an internet access, or being aware of the NHS Choose and Book system, and being aware of the doctor rating websites. Age exhibits a negative correlation, while the gender concordance with the GP, shows a positive correlation. Positive correlations with the awareness of doctor rating websites also hold for respondents who think that those websites are important sources of information, or who see accessibility and financial performances of hospitals important factors in making decisions where to seek healthcare.

[Table 2 in here]

In Table 3 we present the estimate results of four different specifications of the binary logistic regression for the dependent variable *Awareness* with different sets of regressors, which are presented in terms of the odds ratio, together with the standard errors, and levels of significance.

[Table 3 in here]

Among the demographic factors, age and ethnicity are the only significant variables. Older individuals are less likely to be aware of the rating websites, which does not constitute a surprise, as they are usually less familiar with the use of internet in general. Moreover, in most specifications, white British and white non-British respondents appear less likely to be aware of the websites.

Among the broader socio-demographic factors, only income is sometimes (marginally) significant, pointing to the fact that respondents with higher reported levels of income tend to be less aware of the websites, while neither education or gender turn out to be significant predictors of awareness.

Looking at the characteristics of the providers that respondents consider important in making their decisions on where to receive healthcare, in one specification the reputation of the doctor has a strong positive effect, while both clinical and financial performance rates of the providers show negative significant effects. Thus, the respondents who consider the reputation of the doctor important in deciding where to receive care are more likely to be aware of the rating websites, while this is less often the case for respondents putting a higher weight on financial or clinical performance ratings.

Concerning the sources of information, respondents who consider the hospital statistics important in deciding where to receive care, turn out to be more likely of being aware of

1  
2  
3 the rating websites, with an effect which is particularly significant and quite remarkable in  
4 terms of odds ratio.

5  
6 Furthermore, although in one specification the respondents who feel that their GPs spend a  
7 sufficient time in their consultation are less likely to be aware of the internet rating  
8 websites, both the statistical significance and the estimated odds ratio do not appear robust  
9 across specifications. Although all other variables on doctor-patient relationship were not  
10 significant, whenever included among the regressors, the gender match between the GP  
11 and the patient predicts higher awareness of the website ratings, with a noticeable effect as  
12 evident by the reported value of the odds ratio.

13  
14  
15 As mentioned above, from those that were aware of the existence of doctor-rating  
16 websites only 6 have reported to have used these websites. In light of this low usage rate,  
17 and of the consequent limitations of conducting statistical estimations with very little  
18 variation in the dependent outcomes, we have thus focused the rest of the analysis on the  
19 determinants of the intention to use, rather than actual usage of, doctor rating websites.

### 20 21 22 23 24 **Results on the likelihood to use online rating websites**

25 In Table 2 we present the set of bivariate correlations between the intention to use the  
26 doctor rating websites and each of the variables collected in the survey. As it can be  
27 noticed, there is a positive correlation between having internet access, and being aware of  
28 the doctor rating websites. Both the age and the gender concordance with the GP show a  
29 positive correlation with the intention to use. Positive correlations with the willingness to  
30 use doctor rating websites also hold for respondents who think that those websites, or  
31 hospital statistics, are important sources of information. Also the fact that respondents  
32 believe that online rating is a reliable measure is clearly correlated with the intention to  
33 use them. Finally, positive correlations also hold for respondents who feel that their doctor  
34 has time to dedicate to them, or who see several aspects of healthcare providers - such as  
35 reputation, clinical and financial performances, waiting lists, accessibility – as important  
36 factors when making decisions where to seek healthcare.

37  
38  
39 In Table 4 we present the estimate results of six different specifications of the ordered  
40 logistic regression for the dependent variable *IntentionToUse* with different sets of  
41 regressors, which are presented in terms of the odds ratio, together with the standard  
42 errors, and levels of significance.

43  
44  
45 **[Table 4 in here]**

46  
47 Concerning socio-demographic variables, it turns out that white British, as well as  
48 respondents who reported income in higher brackets, said they were less likely to use  
49 doctor-rating websites. Moreover, we do not find any effect of education, age and gender  
50 of the respondents on the likelihood of their intention to use (the results of the  
51 specifications including the age and gender variables are not reported in the table for the  
52 sake of space but are available from the authors upon request).

53  
54  
55 Looking at the characteristics of the healthcare providers that respondents perceived as  
56 important while making decisions where to receive healthcare, our data suggest that those  
57 who consider clinical performance and doctor reputation (in most specifications) as  
58 important factors, are more likely to use doctor-rating websites. These results are

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

consistent with the nature of the information provided in these websites. Also, and quite intuitively, subjects who consider the familiarity with their doctor an important factor to decide where to seek healthcare, tend to be less likely to intend to use websites.

Concerning the role of the different sources of information on the decisions of where to seek healthcare, respondents who see published hospital statistics as important sources of information are more likely to use the rating websites. On the other hand, those for whom GP advice is an important source of information for decision making are less likely to use doctor-rating websites.

Also the nature of the doctor-patient relationship seems to play a key role in explaining whether respondents intend to use online rating websites. First, patients with GPs of the same gender tend to be more likely to use the websites. Second, respondents for whom the doctor is able to listen to them, and who perceive the nature of the relationship with their GP as friendly, also tend to be more likely to use the websites. Third, respondents who feel that their doctor explains things clearly are less likely to use online rating websites. Fourth, it also transpires that the more autonomy patients have in their healthcare decisions, the more likely they are to be willing to use the rating websites.

Finally, concerning, the interaction between levels of satisfaction for the healthcare services within the NHS, and the intention to use doctor-rating websites, note that those that have reported to be more satisfied with the level of choice of GP, and with the amount of choice of the hospital to receive outpatient appointments, are more likely to use these websites. On the other hand, the respondents that are more satisfied with the level of choice of treatments are less likely to use the websites.

## DISCUSSION

In this section we briefly discuss our main findings on the determinants of the intention to use doctor rating websites and the level of awareness and actual usage of these websites. Results show that socio-demographic characteristics (in particular income and ethnicity) and the doctor patient relationship are significant determinants of the intention to use these websites. Regarding the latter we further show that, from a patient's perspective, the doctor and the Internet can be seen as being both "complementary" and "substitute" sources of information. Yet, we find that awareness and usage of doctor rating websites is low in our sample. In what follows we will discuss these results and relate them to evidence from the literature.

### Intention to use

On the socio-demographic variables the results that show that white British and respondents who reported income in higher brackets said that they were less likely to use doctor-rating websites, is partly in contrast to what found by the previous literature<sup>13,14,15</sup> and can signal that white British subjects and respondents with higher self-reported income may feel less in need of checking online doctor ratings, perhaps because they may also have private, or employer-paid, health insurance schemes, or because they are in the position of directly accessing alternative sources of information through their networks of acquaintances. Another possible explanation may be that white British individuals may

1  
2  
3 trust less information that exists online and they have more concerns about confidentiality  
4 issues as shown in a study among different socio-economic groups in the US by Brodie et  
5 al.<sup>16</sup> As the estimated effect of these variables appear to be robust across all empirical  
6 specifications, these findings seem to suggest that online doctor-rating websites are likely  
7 to be particularly attractive to subjects with non-white British ethnicity and less favoured  
8 economic background.  
9

10  
11 On the other hand, the lack of statistical significance in the ordered logit estimates, seems  
12 to suggest that, while age can be a significant factor in explaining the awareness of  
13 Internet for health information, it is not significantly explaining the intention to use  
14 doctor-rating websites once subjects are made aware of their existence. The analogous  
15 lack of significance for the respondents' gender, on the other hand, does not support the  
16 view that women in the UK may be more likely to use patients' sources of information  
17 and rating websites, although they have been found to desire patient choice more than men  
18 (69% to 56%).<sup>9</sup> Both results differ from the findings from the literature on the use of  
19 online information. The literature has shown that socio-demographic characteristics are  
20 major determinants of usage of online health information. In particular women and  
21 younger adults are more active 'online health information seekers'.<sup>10,17-20</sup> Education has  
22 also been found to determine usage of online and offline health information. Cotton and  
23 Gupta<sup>15</sup> and Diaz et al,<sup>13</sup> carried out research into the characteristics of online and offline  
24 health information seekers and found that less educated individuals were less likely to be  
25 users of online health information.  
26  
27

28  
29 Therefore even though, according to our findings, intentions to use do not differ  
30 significantly across all socio demographic characteristics, actual usage may be greatly  
31 determined by access rather than only by intention to use, with the former substantially  
32 differing according to socio-economic and demographic characteristics. That is, there may  
33 exist income-, education- or age-related barriers to actual access that prevent individuals  
34 from using doctor rating sites even though their intentions to use them are similar.  
35

36  
37 From the perspective of the doctor-patient relationship, the finding that patients with GPs  
38 of the same gender tend to be more likely to use the websites is of particular interest, and  
39 it is consistent with the analogous effect found for the likelihood of being aware of those  
40 websites. Considered together these findings point to the possible explanation that the  
41 doctor and the Internet may sometimes be seen by patients as "complementary", rather  
42 than alternative, information channels.<sup>14</sup> This interpretation is further confirmed by the  
43 finding that respondents for whom the doctor is able to listen to them, and who perceive  
44 the nature of the relationship with their GP as friendly, also tend to be more likely to use  
45 the websites.  
46

47  
48 The doctor-patient gender concordance, in fact, has often been reported in the literature as  
49 a factor associated with higher patient satisfaction with the consultation as well as better  
50 outcomes.<sup>21</sup> If we interpret the gender match variable as an indication of satisfaction with  
51 the consultation, our finding indicates that the intention to use (as well as being aware of)  
52 the doctor-rating websites is not necessarily the result of a poor consultation. Instead, the  
53 Internet and the doctor are likely to be seen as complementary, rather than alternative,  
54 information channels. This could explain why patients that consider hospital statistics as a  
55 good source of information are more likely to use these websites. Indeed this type of  
56 information might not be provided by the doctor in a consultation.  
57  
58  
59  
60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Indeed, a study by Stevenson and colleagues<sup>22</sup> shows that although patients use the Internet increasingly more, they show no intention of doing so with the aim of disrupting the existing balance of roles during the doctor-patient consultation. They all mentioned the Internet as an additional resource of health and healthcare information. Other evidence suggests that patients with hypertension who search for more information on the Internet, in addition to that they receive from their doctor, may be more engaged in their treatment, and therefore more willing to adhere to medication prescribed by them.<sup>23</sup>

Finally, the positive association between willingness to use doctor rating websites and levels of satisfaction with the level of choice of GP, and of outpatient appointments in the hospital, can be considered as reinforcing the above discussed interpretation that some dimensions of the doctor-patient relationship may be “complementary” with online information. For instance, patients who are more satisfied with their GP because they feel the latter is more friendly and empathic may also be more likely to engage more actively with health and healthcare information more generally. These results, together with the finding that the respondents who are more satisfied with the level of choice of treatments are less likely to use the websites, suggest that the choice of doctors and providers may be seen as only instrumental for the choice of treatment, and therefore respondents that are happy with treatment choice levels are less likely to shop around for different doctors’ opinions.

On the other hand, there may be other dimensions in the patient-doctor relationship which seem to rather point to a “substitute” relationship with information on the Internet. For instance, the fact that respondents who feel that their doctor explains things clearly and consider the advice given by the GP as being important are less likely to use online rating websites, suggests that when they are generally more satisfied with the feedback provided by their doctor they are less concerned about finding about alternative doctors and compare them with their current GP.

This result on a “substitute relationship” is consistent with previous evidence by Diaz and colleagues<sup>13</sup> that found that 11% of their respondents said they would rather use the Internet ‘instead of seeing or speaking with their doctors’, and that 59% of respondents ‘did not discuss information with their doctors’. It also seems in line with the study by McMullan<sup>14</sup> that indicates that patients who become dissatisfied with the information provided to them by the health professionals are more likely to seek confirmation of the information given and additional information on the Internet.

Our findings that online information can be used not only as “substitute” but also, and perhaps mainly, as “complementary” to several dimensions of the doctor-patient relationship do not seem to entail any particular evidence suggesting that online ratings may put in danger the doctor-patient relationship, an important aspect which has been raised in the literature.<sup>24,25</sup> The “complementarity” findings, in particular, seem consistent with the evidence from the US which shows that the vast majority of the reviews by patients are generally rather positive.<sup>7,8,26</sup> Taken together, this evidence can be seen as providing little support to the related concern that the likeliest to use online ratings and enter actual comments may be the most disgruntled patients.<sup>27</sup>

As for the other aspects of the patient-doctor relationship, the finding that the more autonomous patients are in their healthcare decisions, the more willing they are to use the rating websites is also consistent with previous evidence: a study by McMullan,<sup>14</sup> for instance, reports that patients would seek health information before a consultation ‘to



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

manage their own healthcare independently'. These may be the type of people who are 'more likely to be health-oriented' or 'health conscious', and therefore be more proactive in consultations.<sup>28</sup>

### **Awareness and actual usage**

Only 15% of our sample were aware of the existence of these websites, indicating that the awareness and, consequently, usage of these online sources is still quite limited in the UK, although significantly higher than what the previous studies have shown.<sup>5</sup>

Concerning the low reported rate of active usage of doctor rating websites, the finding is not too surprising given that the survey was done among a sample of respondents from the general population: the reason why many more respondents were aware of the online ratings than did actually use it may simply be because those subjects did not actually need to see a doctor.

These figures are substantially in line with previous evidence brought forward from the literature for the UK.<sup>5,6</sup> A slow uptake of online ratings has also been reported in the US. It is indicative that only 6% of Americans were aware of Hospital Compare, the quality reporting website maintained by the Centres for Medicare and Medicaid Services (CMS).<sup>29</sup> Gao et al.<sup>8</sup> analysed 386,000 national ratings from 2005-2010 in the US and showed that only 1 out of 6 physicians among those included in the study had received some rating. Lagu, Hannon, Rothberg et al.<sup>7</sup> also reported a low average number of ratings per physician.

The fact that even in the US, a more market-oriented health system, the use of similar sites is not much higher may suggest that the slow uptake in the UK cannot be attributed only to the early stage of the "choice" model. Considered together these results may pose concerns on the reasons and consequences of the lack of patient awareness and usage of online health related information.

Previous studies in the US have reported a number of reasons behind this slow uptake, including i) the preference for more traditional information channels, such as recommendations by family and friends; ii) the lack of time; and iii) in many cases the fact that people do not recognise that the quality of care may vary.<sup>25</sup>

As for the UK, our study confirms that not only awareness of rating websites is still limited among a sample of respondents the general public in London, but awareness and willingness to use per se do not seem a sufficient condition to guarantee active usage. This poses a double challenge from a clinician and health policy perspective. In fact, on the one hand, the documented correlation between online ratings and other measures of healthcare quality, including survey-based ratings and clinical quality indicators,<sup>30,31</sup> necessarily requires that patients have already gone through three preliminary hurdles, namely i) being aware of, ii) having effective access to, and ii) being active users of the doctor rating websites. If the ultimate goal is indeed the continuous enhancement of healthcare quality, the effective removal of this triple hurdle is likely to become the next priority to guarantee the full spread of online rating website.

On the other hand, while appropriate online and offline informational campaigns are likely to overcome the first hurdle, thus effectively raising patients' awareness of online ratings as a potential source of information on provider quality, informational campaigns alone

1  
2  
3 can fail to grant effective access and trigger actual changes in behaviour. Alike in several  
4 other health contexts, in particular, ‘nudging’ behaviour may be difficult as a mere  
5 consequence of accessing more information.  
6

7  
8 If this is the case, other avenues should be explored to increase the active usage of rating  
9 websites by patients who are already aware of them. For instance, the evidence brought  
10 forward by the present study confirms the importance of the doctor-patient relationship as  
11 a factor determining individuals’ awareness of and willingness to use online ratings<sup>25,32-35</sup>  
12 and suggests that tailored behavioural interventions based on the doctor-patient  
13 relationship have the potential to help patients to overcome the last hurdle and actively  
14 engage with online ratings.  
15

### 16 17 **Limitations of the study**

18  
19 The convenience field survey was considered the most appropriate administration mode to  
20 involve a sample of respondents from the general population. An online survey, in fact, by  
21 exclusively reaching the segment of active internet users, would have failed to address the  
22 main goal of the study.  
23

24  
25 However, while dictated by practical issues, the convenience sampling is a limitation of  
26 the study, and tends to over-represent respondents who are currently not employed, such  
27 as unemployed, retired and students. Also the fact that the study was conducted in only  
28 one borough of London limits the possibility to immediately generalise the findings to the  
29 broader UK population.  
30

31  
32 In an attempt to make such limitations of smaller concern to enhance the external validity  
33 and generalisability of the analysis, we have i) chosen a borough which comprises a mix  
34 of both affluent and deprived neighbourhoods from heterogeneous ethnic backgrounds; ii)  
35 conducted surveys in the field at different public locations and at different times of the  
36 day and of the week to approach both working and non-working members of the public;  
37 and iii) controlled for a wide range of socio-demographic measures in the statistical  
38 analysis.  
39

### 40 41 42 **CONCLUSIONS**

43  
44 By collecting a broad range of information on the socio-demographic characteristics of the  
45 respondents, their views and perceptions of the most important aspects of healthcare  
46 quality, patient choice, and doctor-patient relationship, the study explicitly explores the  
47 usage doctor-rating websites, the determinants of respondents’ awareness of the doctor  
48 ratings websites, and of their intention to use the sites in the future.  
49

50  
51 This study brings forward direct evidence suggesting that the awareness and actual usage  
52 of doctor-rating websites in the UK remains particularly low. The main finding suggests  
53 that the doctor-patient relationship plays a key role in explaining intention to use the  
54 websites and that the doctor has both a “complementary” and “substitute” role with  
55 respect to Internet information.  
56  
57  
58  
59  
60

1  
2  
3 The existence of both “substitute” and “complementary” effects between the doctor-  
4 patient and the Internet information channels is not at all conflicting. In fact, they both  
5 indicate that the level of concordance achieved during the consultation is likely to define  
6 whether or not individuals will seek for further information channels, such as the Internet.  
7

8  
9 The findings of our study thus contribute also to the wider debate on the inter-  
10 relationships between Internet usage and the doctor-patient relationship.<sup>7,25-26,32-35</sup> The  
11 argument, sometimes addressed by the previous literature, that information on the Internet  
12 can threaten the trust relationship and the balance of roles between doctors and patients,  
13 seems a concern which is not supported by our evidence. If any, a potential challenge to  
14 the doctor-patient relation can only affect the patients who already feel dissatisfied with  
15 the ability of their doctor to listen to them and provide them enough information regarding  
16 their condition, or with the level of their choice for healthcare treatments.  
17

18  
19 The above, however, can hardly be seen as a serious threat by those who advocate a  
20 greater choice by patients. On the contrary, if the latter is indeed a priority in the health  
21 policy agenda, online information on healthcare providers should be seen as a challenging  
22 opportunity to enhance patients’ choice in healthcare, and public engagement with health  
23 information, especially for the less favoured segments of the population. Indeed, our  
24 findings suggest that subjects of non-white background and with lower income are more  
25 willing to use online ratings.  
26

27  
28 Finally, our study highlights that subjects who use doctor rating websites are unlikely to  
29 be representative of the overall patients’ pool. In particular, they tend to over-represent  
30 opinions from non-white British, medium-low income patients who are not satisfied with  
31 their choice of healthcare treatments. Accounting for differences in the users’  
32 characteristics is important when interpreting results from doctor-rating sites and when  
33 informing interventions that aim at enhancing the public engagement with health  
34 information on the Internet, and the representativeness of the users who seek and provide  
35 feedback online.  
36

37  
38  
39 **Data sharing:** technical appendix, statistical code and dataset available from the  
40 corresponding author at [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk). Consent for data sharing was not  
41 obtained but the presented data are anonymised and risk of identification is low.  
42

43  
44 All authors had full access to all the data in the study and take responsibility for the  
45 integrity of the data and the accuracy of the data analysis.  
46

47  
48 **Funding:** this piece of work has not received any specific funding.  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## REFERENCES

1. Department of Health. The NHS Plan: a plan for investment, a plan for reform. Crown 2000. Cm 4818-I.
2. Department of Health. The NHS Improvement Plan: Putting people at the heart of public services. London: The Stationery Office 2004. Cm 6268.
3. Department of Health. Creating a patient-led NHS: Delivering the NHS Improvement Plan. London: The Stationery Office 2005.
4. Department of Health. High Quality Care For All: NHS Next Stage Review final report. London: The Stationery Office 2008. Cm 7432.
5. Dixon A, Robertson R, Appleby J, et al. Patient Choice. London: The Kings Fund 2010 [http://www.kingsfund.org.uk/publications/patient\\_choice.html](http://www.kingsfund.org.uk/publications/patient_choice.html)
6. Department of Health. Report of the National Patient Choice Survey, England. Crown 2008.
7. Lagu T, Hannon NS, Rothberg MB, et al. Patients' Evaluations of Health Care Providers in the Era of Social Networking: An Analysis of Physician-Rating Websites. *J Gen Intern Med* 2010;**25**(9):942-6.
8. Gao GG, McCullough JS, Agarwal R et al. A Changing Landscape of Physician Quality Reporting: Analysis of Patients' Online Ratings of Their Physicians Over a 5-Year Period. *J Med Internet Res* 2012; **14**(1):e.38.
9. Appleby J, Alvarez A. Public Responses to NHS Reform. In British Social Attitudes Survey 22nd Report, London: Sage Publications 2005.
10. Ybarra M, Suman M. Help seeking behavior and the Internet: A national survey. *Int J Med Inform* 2006;**75**(1): 29-41.
11. Cohen J. Statistical Power Analysis for the Behavioural Sciences. Academic Press, New York and London 1969.
12. Office for National statistics. 2001 Census: Key Statistics. 2001. Available from: <http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.doa=3&b=276755&c=hammersmith&d=13&e=15&g=334516&i=1001x1003x1004&m=0&r=1&s=1273150763921&enc=1&dsFamilyId=47>
13. Diaz JA, Griffith RA, Ng JJ, et al. Patients' use of the Internet for medical information. *J Gen Intern Med* 2002;**17**(3): 180-185.
14. McMullan M. Patients using the Internet to obtain health information: how this affects the patient-health professional relationship. *Patient Educ Couns* 2006;**63**(1-2): 24.
15. Cotten SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. *Soc Sc Med* 2004;**59**(9): 1795-1806.
16. Brodie M, Flournoy RE, Altman DE, et al. Health information, the Internet, and the digital divide. *Health Affairs* 2000; **19**(6): 255-265.
17. Health on the Net Foundation. HON's fourth survey on the use of the Internet for medical and health purposes, 1999.
18. Fox L, Rainie J, Horrigan A, et al. The online healthcare revolution: How the web helps Americans take better care of themselves, Pew Internet and American Life Project, 2000.
19. Baker L, Wagner TH, Singer S, et al. Use of the Internet and e-mail for health care information. *JAMA* 2003; **289**(18): 2400-6.
20. Wald HS, Dube CE, Anthony DC. Untangling the Web-The impact of internet use on health care and the physician-patient relationship. *Patient Educ Couns* 2007; **68**(3): 218-224.

- 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
  - 10
  - 11
  - 12
  - 13
  - 14
  - 15
  - 16
  - 17
  - 18
  - 19
  - 20
  - 21
  - 22
  - 23
  - 24
  - 25
  - 26
  - 27
  - 28
  - 29
  - 30
  - 31
  - 32
  - 33
  - 34
  - 35
  - 36
  - 37
  - 38
  - 39
  - 40
  - 41
  - 42
  - 43
  - 44
  - 45
  - 46
  - 47
  - 48
  - 49
  - 50
  - 51
  - 52
  - 53
  - 54
  - 55
  - 56
  - 57
  - 58
  - 59
  - 60
21. Bertakis KD. The influence of gender on the doctor-patient interaction. *Patient Educ Couns* 2009;**73**(3): 356-60.
22. Stevenson FA, Kerr C, Murray E, et al. Information from the Internet and the doctor-patient relationship: the patient perspective – a qualitative study. *BMC Fam Pract* 2007;**8**: 47.
23. Stavropoulou C. Perceived information needs and non-adherence: evidence from Greek patients with hypertension. *Health Expect* 2012;**15**(2): 187-196.
24. McCartney M. Will doctor rating sites improve the quality of care? *BMJ* 2009: **338b** 1033.
25. Lagu T and Lindenauer PK. Putting the public back in public reporting of health care quality. *JAMA* 2010;**304**(15):1711-1712.
26. López A, Detz A, Ratanawongsa N, et al. What Patients Say About their Doctors Online: A Qualitative Content Analysis. *J Gen Intern Med* 2012;**27**(6):685-92.
27. Wachter B. The patient will rate you now. 2012 Available at: <http://community.the-hospitalist.org/2012/03/19/the-patient-will-rate-you-now>
28. Dutta-Bergman MJ. Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. *J Med Internet Res* 2004;**6**(2): e15.
29. Kaiser Family Foundation, 2008 Update on consumers' views of patient safety and quality information. Kaiser Family Foundation. <http://www.kff.org/kaiserpolls/posr101508pkg.cfm>
30. Greaves F, Pape U, King D, et al. Associations between internet-based patient ratings and conventional surveys of patient experience in the English NHS: an observational study. *BMJ Qual Saf* 2012; **21**: 600-605.
31. Greaves F, Pape UJ, King D, et al. Associations between Web-based patient ratings and objective measures of hospital quality. *Arch Intern Med* 2012;**172**: 435-436.
32. Nwosu CR, Cox BM. The impact of the Internet on the doctor-patient relationship. *Health Informatics Journal* 2000;**6**(3): 156-161.
33. Broom A. Virtually He@lthy: The Impact of Internet Use on Disease Experience and the Doctor-Patient Relationship. *Quality Health Research* 2005;**15**(3): 325-345.
34. Gorrindo T. Web searching for information about physicians. *JAMA* 2008; **300**(2): 213.
35. Malone M, Mathes L, Dooley J et al. Health information seeking and its effect on the doctor-patient digital divide. *Journal of Telemedicine and Telecare* 2005: **11** (Suppl.1): S1:25-28.

**Appendix**  
**Table 1 Variable description and descriptive statistics**

Variable	Obs	Mean	Std. Dev
<b>Awareness (<i>Awareness</i>) (0=no, 1=yes)</b>	200	0.142	0.350
<b>Intention to use (<i>IntentionToUse</i>)</b>	199	2.136	0.743
<b>Not likely</b>	43		
<b>Quite likely</b>	86		
<b>Likely</b>	70		
<b>Important factors in making decisions (1=not important at all, 5=very important)</b>			
<b>Waiting lists (<i>HC_Waiting</i>)</b>	198	3.818	1.165
<b>Rates of hospital-acquired complications (<i>HC_HospComp</i>)</b>	188	3.761	1.193
<b>Clinical performance (<i>HC_Clinical_Performance</i>)</b>	189	4.037	1.136
<b>Closeness to home (<i>HC_CloseHome</i>)</b>	200	3.683	1.265
<b>Familiarity with the doctor (<i>HC_Familiarity</i>)</b>	194	3.237	1.306
<b>Financial performance of the hospital (<i>HC_FinPerform</i>)</b>	191	2.387	1.164
<b>Reputation of the doctor (<i>HC_GP_Reputation</i>)</b>	199	3.980	1.137
<b>Accessibility and parking facilities (<i>HC_Access</i>)</b>	192	2.656	1.321
<b>Past experience with the provider (<i>HC_PastExp</i>)</b>	193	3.544	1.311
<b>Important sources of information in making decisions (1=not important at all, 5=very important)</b>			
<b>GP advice (<i>SI_GP_Advice</i>)</b>	198	4.071	1.030
<b>Published hospital statistics (<i>SI_HospStat</i>)</b>	183	2.934	1.193
<b>Online doctor rating websites (<i>SI_DoctorRating</i>)</b>	178	2.315	1.204
<b>Personal experiences in the past (<i>SI_PastExp</i>)</b>	192	4.234	1.004
<b>Feedback from family/friends (<i>SI_Family</i>)</b>	194	4.149	0.924
<b>I feel the doctor...</b>			
<b>...listens (0=no, 1=yes) (<i>DOC_Listens</i>)</b>	200	0.575	0.496
<b>...has time (0=no, 1=yes) (<i>DOC_Time</i>)</b>	200	0.410	0.493
<b>...explains (0=no, 1=yes) (<i>DOC_Explains</i>)</b>	200	0.555	0.498
<b>...is friendly (0=no, 1=yes) (<i>DOC_Friend</i>)</b>	200	0.445	0.498
<b>... Is someone I can trust (0=no, 1=yes) (<i>DOC_Trust</i>)</b>	200	0.550	0.499
<b>I feel that online rating is a reliable measure (1=very unreliable, 5=very reliable) (<i>Reliable</i>)</b>	141	2.759	1.055
<b>How actively do you participate with your GP in making decisions (<i>Participation</i>)</b>	193		
<b>My doctor always makes decisions for me</b>	2		
<b>I like to know the options available but still let my doctor decide for me</b>	13		
<b>My doctor and I make the decisions together</b>	25		
<b>I make decisions for myself, after considering the advice of my GP</b>	65		
<b>I always make my own decisions, independently of the advice of my GP</b>	75		
<b>I make decisions with my parents/spouse/relatives</b>	13		
<b>Satisfied with the current level of choice of... (1 = strongly dissatisfied, 5 = strongly satisfied)</b>			
<b>...GP (<i>SAT_C_GP</i>)</b>	173	3.451	1.138
<b>...hospital (<i>SAT_C_Hosp</i>)</b>	152	3.493	1.055
<b>...doctor (<i>SAT_C_Doc</i>)</b>	139	3.252	1.022
<b>...treatment (<i>SAT_C_Treatment</i>)</b>	148	3.554	0.928
<b>...time spent (<i>SAT_C_Time</i>)</b>	168	3.179	1.123

<b>Ethnicity</b>				
<b>White British (0=no, 1=yes) (WhiteBritish)</b>	200	0.488	0.501	
<b>White Other (0=no, 1=yes) (WhiteNonBritish)</b>	200	0.222	0.417	
<b>Highest level of educational attainment* (Education)</b>				
<b>1 if GCSE</b>	12			
<b>2 if A-Level/BTEC/Vocational</b>	36			
<b>3 if University undergraduate degree</b>	86			
<b>4 if Postgraduate Degree</b>	52			
<b>Age (years) (Age)</b>	199	39.572	16.083	
<b>Gender (Gender)</b>				
<b>Female (=1)</b>	112			
<b>Male (=0)</b>	88			
<b>Income (Income)</b>				
<b>0</b>	40			
<b>&lt;£15000 but &gt;0</b>	27			
<b>£15,000-£35,000</b>	36			
<b>£35,000-55,000</b>	22			
<b>£55,000-£75,000</b>	14			
<b>£75,000-£95,000</b>	7			
<b>&gt;£95,000</b>	14			
<b>Doctor-patient concordance</b>				
<b>Age Match (=1 if doctor and patient belong to the same age bracket; =0 otherwise) (AgeMatch)</b>	200	0.333	0.473	
<b>Gender Match (=1 if patient and doctor are of same gender; =0 otherwise) (GenderMatch)</b>	200	0.444	0.498	

Table 2: Bivariate Correlations

	IntentionToUse	Awareness		IntentionToUse	Awareness
<b>IntentionToUse</b>	1		<b>DOC_Friend</b>	0.0127 (0.8599)	-0.0984 (0.1667)
<b>Awareness</b>	0.0846 (0.2359)	1	<b>DOC_Trust</b>	-0.0288 (0.6899)	-0.0388 (0.5863)
<b>HC_Waiting</b>	0.1617** (0.025)	0.016 (0.8236)	<b>Participation</b>	0.0412 (0.5678)	0.0189 (0.7911)
<b>HC_HospComp</b>	0.1474** (0.0465)	-0.0033 (0.9643)	<b>SAT_C_GP</b>	-0.0419 (0.591)	0.122 (0.1108)
<b>HC_Clinical_Performance</b>	0.2146*** (0.0034)	-0.0784 (0.2849)	<b>SAT_C_Hosp</b>	-0.003 (0.9715)	0.1024 (0.2111)
<b>HC_CloseHome</b>	-0.0623 (0.3848)	-0.0998 (0.1587)	<b>SAT_C_Doc</b>	-0.0348 (0.6909)	0.137 (0.1077)
<b>HC_Familiarity</b>	-0.0078 (0.9153)	-0.0752 (0.2986)	<b>SAT_C_Treatment</b>	-0.0157 (0.8526)	0.0932 (0.2598)
<b>HC_FinPerform</b>	0.1253** (0.0884)	0.1435** (0.0482)	<b>SAT_C_Time</b>	-0.0239 (0.7632)	0.0541 (0.4878)
<b>HC_GP_Reputation</b>	0.2020*** (0.0047)	-0.016 (0.8234)	<b>CB_AWARE</b>	-0.0381 (0.5972)	0.2997*** (0)
<b>HC_Access</b>	0.0451 (0.5399)	0.1196* (0.0992)	<b>CB_Use</b>	0.0996 (0.1651)	0.054 (0.4477)
<b>HC_PastExp</b>	0.0978 (0.182)	-0.0244 (0.7369)	<b>WEB_Access</b>	0.2054*** (0.0041)	0.1197* (0.0923)
<b>SI_GP_Advice</b>	0.1054 (0.1457)	0.0163 (0.8202)	<b>AgeMatch</b>	0.1373* (0.0532)	0.0695 (0.3234)
<b>SI_HospStat</b>	0.2937*** (0.0001)	0.1159 (0.1192)	<b>GenderMatch</b>	0.2077*** (0.0032)	0.1472** (0.0357)
<b>SI_DoctorRating</b>	0.3759*** (0)	0.1240* (0.099)	<b>WhiteBritish</b>	-0.0429 (0.5477)	-0.0662 (0.3468)
<b>SI_PastExp</b>	0.0563 (0.4455)	-0.0803 (0.2696)	<b>WhiteNonBritish</b>	-0.0017 (0.9809)	-0.0853 (0.2252)
<b>SI_Family</b>	0.1215* (0.0958)	-0.0511 (0.4804)	<b>Income</b>	0.012 (0.8818)	-0.1219 (0.1246)
<b>Reliable</b>	0.3429*** (0)	-0.0311 (0.7153)	<b>Education</b>	-0.0103 (0.8913)	0.0023 (0.9757)
<b>DOC_Listens</b>	0.0629 (0.3824)	-0.0888 (0.2122)	<b>Gender</b>	0.0315 (0.6614)	-0.0087 (0.9029)
<b>DOC_Time</b>	0.1565** (0.0289)	-0.0117 (0.87)	<b>Age</b>	-0.1081 (0.1344)	-0.1918*** (0.0068)
<b>DOC_Explains</b>	0.0968 (0.1784)	0.0152 (0.8314)			

P-Values in parentheses. \* p<.10, \*\* p<.05, \*\*\* p<.01



Table 3 Odds Ratios for the Binary Logit explaining the awareness of doctor rating websites.

	Model 1	Model 2	Model 3	Model 4
<b>Awareness</b>				
<b>Age</b>	0.953*	0.931**		
	(0.0239)	(0.0307)		
<b>Gender</b>	1.347	1.819		
	(0.648)	(1.092)		
<b>WhiteBritish</b>	0.595	0.841	0.401	0.0150**
	(0.309)	(0.524)	(0.276)	(0.0292)
<b>WhiteNonBritish</b>	0.273*	0.398	0.228*	0.00399**
	(0.198)	(0.324)	(0.200)	(0.00957)
<b>Education</b>	1.105	1.396	1.279	1.682
	(0.341)	(0.534)	(0.438)	(1.399)
<b>Income</b>	0.952	0.943	0.708*	0.228*
	(0.157)	(0.169)	(0.132)	(0.180)
<b>HC_HospComp</b>		1.173	1.353	2.237
		(0.366)	(0.442)	(1.825)
<b>HC_Clinical_Performance</b>		0.691	0.527	0.0342*
		(0.245)	(0.207)	(0.0609)
<b>HC_Familiarity</b>		0.710	0.756	2.564
		(0.170)	(0.202)	(2.096)
<b>HC_GP_Reputation</b>		1.409	1.611	13.57*
		(0.509)	(0.599)	(19.95)
<b>HC_FinPerform</b>		0.921	0.963	0.0783**
		(0.264)	(0.297)	(0.0919)
<b>HC_Access</b>		1.112	1.088	0.917
		(0.236)	(0.242)	(0.444)
<b>SI_GP_Advice</b>		1.173	0.922	1.115
		(0.350)	(0.290)	(0.718)
<b>SI_HospStat</b>		1.291	1.390	49.75**
		(0.410)	(0.477)	(87.28)
<b>SI_Family</b>		0.935	0.614	0.146
		(0.361)	(0.273)	(0.186)
<b>SI_PastExp</b>		0.762	1.202	0.284
		(0.275)	(0.499)	(0.343)
<b>SI_DoctorRating</b>		0.938	0.933	1.859
		(0.261)	(0.271)	(1.119)
<b>DOC_Listens</b>			0.416	1.182
			(0.324)	(2.244)
<b>DOC_Time</b>			1.289	0.00185**
			(0.950)	(0.00580)
<b>DOC_Explains</b>			2.533	0.885
			(1.799)	(1.658)
<b>DOC_Friend</b>			0.752	15.62
			(0.535)	(30.63)
<b>DOC_Trust</b>			0.930	3.173
			(0.583)	(4.555)
<b>Participation</b>			1.080	3.346
			(0.298)	(2.835)
<b>AgeMatch</b>			2.247	269.4*
			(1.429)	(791.0)
<b>GenderMatch</b>			3.153*	32.77*
			(1.867)	(61.36)
<b>SAT_C_GP</b>				3.020
				(2.948)
<b>SAT_C_Hosp</b>				0.802
				(1.134)

<b>SAT_C_Doc</b>	2.794
	(3.411)
<b>SAT_C_Treatment</b>	1.818
	(2.311)
<b>SAT_C_Time</b>	0.735
	(0.550)
<b>Same GP</b>	0.641
	(0.766)

Exponentiated coefficients; Standard errors in parentheses

\* p<.10, \*\* p<.05, \*\*\* p<.01

For peer review only

Table 4 Odds Ratios for the Ordered Logit explaining the likelihood to use doctor rating websites

	m1	m2	m3	m4	m5	m6
<b>AgeMatch</b>	1.974 (2.377)	2.561 (2.953)	2.000 (1.965)	2.782 (2.613)	1.051 (0.818)	0.946 (0.729)
<b>GenderMatch</b>	18.42* (30.24)	12.03* (17.75)	10.45** (12.33)	10.39** (10.54)	16.67*** (15.48)	14.83*** (13.17)
<b>Awareness</b>	0.0531 (0.108)	0.0505 (0.0971)	0.0964 (0.149)	0.0758** (0.0985)	0.159* (0.176)	0.147* (0.152)
<b>HC_Clinical_Performance</b>	9.289* (11.84)	7.659* (8.241)	5.560** (4.759)	3.401* (2.253)	4.395** (2.653)	4.985*** (2.734)
<b>HC_Familiarity</b>	0.359 (0.287)	0.468 (0.282)	0.371* (0.220)	0.414* (0.206)	0.355** (0.147)	0.351*** (0.141)
<b>HC_GP_Reputation</b>	2.328 (1.980)	2.827 (2.106)	3.608* (2.542)	4.410** (2.753)	2.903** (1.374)	2.776** (1.260)
<b>SI_GP_Advice</b>	0.170* (0.173)	0.223 (0.206)	0.238** (0.167)	0.283** (0.176)	0.344** (0.186)	0.396* (0.193)
<b>SI_HospStat</b>	14.26** (18.84)	13.74** (15.60)	7.220*** (5.008)	6.550*** (4.200)	5.371*** (2.932)	5.133*** (2.703)
<b>SI_DoctorRating</b>	1.596 (1.636)	1.067 (0.958)	1.424 (0.851)	1.461 (0.770)	2.245** (0.835)	2.312** (0.876)
<b>Reliable</b>	6.181 (7.691)	8.682* (9.969)	6.492** (4.993)	7.586*** (5.561)	4.457*** (2.351)	4.061*** (2.003)
<b>DOC_Listens</b>	141.9* (424.8)	51.44 (126.4)	44.20* (90.99)	27.05** (41.26)	22.03** (28.29)	22.98** (28.34)
<b>DOC_Explains</b>	0.00690* (0.0183)	0.00680** (0.0148)	0.00509** (0.0105)	0.00695*** (0.0124)	0.0120*** (0.0171)	0.0124*** (0.0169)
<b>DOC_Friend</b>	12.88 (29.23)	8.375 (14.65)	16.48** (22.41)	19.66*** (22.45)	8.718** (8.047)	7.781** (6.896)
<b>Participation</b>	5.473* (5.255)	5.818* (5.410)	5.171** (3.664)	4.162** (2.687)	2.349* (1.126)	2.228* (1.036)
<b>SAT_C_GP</b>	17.03* (27.58)	8.038 (10.23)	6.593* (6.659)	5.410** (4.048)	4.692** (2.889)	4.377*** (2.484)
<b>SAT_C_Hosp</b>	21.93** (33.71)	22.86** (30.90)	30.01*** (33.63)	34.38*** (35.43)	17.95*** (15.52)	11.11*** (7.578)
<b>SAT_C_Treatment</b>	0.0515** (0.0764)	0.0561** (0.0794)	0.111** (0.106)	0.147** (0.125)	0.145** (0.111)	0.111*** (0.0788)
<b>WhiteBritish</b>	0.0137* (0.0318)	0.0409* (0.0738)	0.0542** (0.0782)	0.0539** (0.0690)	0.0909** (0.0890)	0.105** (0.0973)
<b>Income</b>	0.416* (0.190)	0.382** (0.162)	0.449** (0.154)	0.513** (0.154)	0.476*** (0.129)	0.462*** (0.120)
<b>SAT_C_Doc</b>	0.242 (0.468)	0.243 (0.374)	0.148* (0.161)	0.135* (0.144)	0.427 (0.321)	
<b>SI_PastExp</b>	0.670 (0.787)	0.590 (0.650)	0.535 (0.576)	0.551 (0.250)		
<b>Education</b>	0.486 (0.526)	0.583 (0.554)	0.683 (0.443)	0.610 (0.328)		
<b>HC_Access</b>	1.046 (0.659)	1.124 (0.678)	1.241 (0.564)	1.347 (0.565)		
<b>HC_PastExp</b>	1.030 (0.578)	0.914 (0.487)	0.930 (0.397)			
<b>SI_Family</b>	1.208 (1.357)	1.305 (1.484)	1.439 (1.458)			
<b>DOC_Time</b>	1.223 (2.118)	2.099 (3.261)	2.594 (3.547)			

<b>DOC_Trust</b>	0.153	0.608	0.460			
	(0.327)	(0.983)	(0.629)			
<b>WEB_Access</b>	1.122	0.558	0.483			
	(4.345)	(1.763)	(0.918)			
<b>HC_Waiting</b>	0.960	1.097				
	(0.806)	(0.846)				
<b>HC_HospComp</b>	1.200	0.790				
	(0.929)	(0.540)				
<b>HC_CloseHome</b>	0.930	0.790				
	(0.726)	(0.516)				
<b>HC_FinPerform</b>	0.610	0.692				
	(0.621)	(0.588)				
<b>SAT_C_Time</b>	1.449	1.530				
	(1.441)	(1.280)				
<b>WhiteNonBritish</b>	0.742	0.493				
	(1.790)	(1.041)				
<b>CB_AWARE</b>	1.422					
	(3.158)					
<b>CB_Use</b>	83.93					
	(354.7)					
<b>_cut1</b>	9454769.9**	2474784.8**	3131224.6**	2460471.3***	10470831.2***	13892352.4***
	(63313549.3)	(15197453.2)	(18256829.6)	(13260544.4)	(45550085.5)	(59299449.7)
<b>_cut2</b>	7.05660e+09*	1.22556e+09***	1.14387e+09***	674102348.3***	1.42570e+09***	1.60379e+09***
	**					
	(5.66892e+10)	(8.86204e+09)	(7.69789e+09)	(4.20283e+09)	(7.17551e+09)	(7.78799e+09)

# QUESTIONNAIRE

---

## Imperial College Business School



We would be very grateful for your cooperation in completing this questionnaire. It should take around **10 minutes** to complete.

The data collected will contribute towards a study into the healthcare service in the UK. There are currently major changes taking place in the NHS, in an effort to improve the choice and quality of services available to the public. One of these changes has been the introduction of a system called “Choose & Book” which gives you the option to choose which hospital you wish to go to for your outpatient appointment, following a GP referral. This is a study into how individuals regard these new choices and how they make decisions about where to receive care. In particular, we are studying the awareness and use of online doctor rating websites as a source of information for patients. These doctor rating websites allow patients to rate their doctors and provide feedback based on their own experiences. The ratings can then be used by others when deciding where to receive health care.

All data collected will remain strictly confidential. The study is being conducted by researchers from Imperial College London and King’s College London. If you would like to be informed of the results of this study, please contact [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk).

## SECTION A

[www.iwantgreatcare.com](http://www.iwantgreatcare.com)

[www.NHSchoices.co.uk](http://www.NHSchoices.co.uk)

[www.patientopinion.co.uk](http://www.patientopinion.co.uk)

[www.privatehealth.co.uk](http://www.privatehealth.co.uk)

**Q1. Are you aware of any of the above online doctor rating websites or any other doctor rating websites?**

Yes                      No  (if No, skip ahead to Section C)

Other (please specify).....

**Q2. How did you find out about these sites?**

Family/Friends                       Doctor

The Media                       Other (please specify).....

## SECTION B

**Q3. Have you used these websites in the past to look at doctor/hospital ratings?**

Yes                       No  (if No, skip ahead to Section C)

**Q4. What specialty of doctor have you searched for in the past in these websites?**

.....

**Q5. When do you use these websites?**

On a regular basis                       Only before/after an appointment  Rarely

**Q6. In the past, has the information on these websites influenced your choice of doctor/hospital?**

Yes                       No

**Q7. If Yes, was this based on positive or negative information on the websites?**

Positive information                       Negative information

**Q8. How easy to use do you find the sites?** Please circle the most appropriate number on a scale of 1 to 5 (1=very easy, 5=very difficult)

1            2            3            4            5

## SECTION C

**Q9. Which of the following factors are important to you in making decisions about where to receive healthcare?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important), or 'none of these'.

Waiting lists	1	2	3	4	5
Rates of hospital-acquired complications	1	2	3	4	5
Clinical performance rating	1	2	3	4	5
Closeness to home	1	2	3	4	5
Familiarity with the doctor	1	2	3	4	5
Financial performance of the hospital	1	2	3	4	5
Reputation of the doctor	1	2	3	4	5
Accessibility and parking facilities	1	2	3	4	5
Past experience with the provider	1	2	3	4	5
None of these					<input type="checkbox"/>

**Q10. Which of the following sources of information are important in making decisions about where to receive health care?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important).

GP advice	1	2	3	4	5
Published hospital statistics	1	2	3	4	5
Online doctor rating website	1	2	3	4	5
Personal experiences in the past	1	2	3	4	5
Feedback from family/friends	1	2	3	4	5

**Q11. To what extent do you think that the online rating of doctors by patients is a reliable measure of a doctor's performance?** Please circle the most appropriate number on a scale of 1 to 5 (1=very unreliable, 5=very reliable)

1      2      3      4      5                      Not sure     

**Q12. If you have not used these websites before, how likely do you feel you will use them in the future?**

Not likely                       Quite likely                       Likely

## SECTION D

**Q13. These websites are based on patient input. Individuals can provide feedback based on their own experiences. Considering this, when would you be most likely to contribute to the online site?** Tick all that apply.

- Every time
- After particularly positive experiences only
- After particularly negative experiences only
- After both positive and negative experiences
- Never
- Not sure

**Q14. Out of the following what would be your motive for any contributions that you make to an online doctor rating site?** Tick all that apply.

- I would not contribute to these websites
- To inform other patients
- To improve standards of care in the NHS
- As a method of complaint
- In appreciation of a doctor's service
- Not sure

## SECTION E

**Q15. Which of the following attributes would you use to describe your GP?** Tick all that apply.

- I feel my doctor listens to my problems
- I feel my doctor spends enough time with me in each consultation
- I feel my doctor explains things clearly
- I feel my doctor is sociable and friendly



- 1  
2  
3  
4  
5  
6  
7  
8  
9
- I feel that I can trust my doctor's opinions  
 None of the above

10  
11  
12  
13

**Q16. How actively do you participate with your GP in making decisions about your health care generally?** Tick the single most appropriate.

- 14  
15  
16  
17  
18  
19  
20  
21
- My doctor always makes decisions for me  
 I like to know the options available but still let my doctor decide for me  
 My doctor and I make the decisions together  
 I make decisions for myself, after considering the advice of my GP  
 I always make my own decisions, independently of the advice of my GP  
 I make decisions with my parents/spouse/relatives

22  
23

**Q17. Within your GP practice do you always want to see the same GP for an appointment?**

- 24  
25  
26
- I always request to see the same GP  
 I don't mind which doctor I see.

27  
28  
29

**Q18. Where is choice more important to you in the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 =of no importance, 5 =very important) or select 'not sure'.

30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of appointment time (for primary & secondary care)	1	2	3	4	5	Not sure	<input type="checkbox"/>

50  
51  
52  
53  
54

**Q19. How satisfied are you with the current level of choice of where you can receive health care within the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 = strongly dissatisfied, 5 = strongly satisfied) or select 'not sure'.

55  
56  
57  
58  
59  
60

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>

Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of appointment time (for primary & secondary care)	1	2	3	4	5	Not sure	<input type="checkbox"/>

**Q20. Choose and Book is a new NHS system which gives you the option to choose which hospital you wish to go to for your outpatient appointment. Are you aware of this system?**

Yes  No

**Q21. Have you used this Choose and Book system in the past?**

Yes  No

**Q22. If you have used the Choose & Book system in the past, how actively have you participated in making decisions about where to receive care? Tick the single most appropriate.**

- I have never used Choose & Book
- My doctor always makes decisions for me
- I like to know the options available but still let my doctor decide for me
- My doctor and I make the decisions together
- I make decisions for myself, after considering the advice of my GP
- I always make my own decisions, independently of the advice of my GP
- I make decisions with my parents/spouse/relative

**Q23. When is the choice of hospital important to you, for outpatient referrals? Tick all that apply.**

- Routine outpatient consultation
- Day-case procedure/surgery
- Major surgery
- None of these

---

## SECTION F

**Q24. Do you have access to a computer/laptop with internet access, at home or at work?**

Yes  No

**Q25. Have you used the internet in the past to search for health information?**

Yes  No

**Q26. If you do not use online doctor rating websites, which of the following factors stops you from doing so? Tick all that apply**

- I'm too busy to have the time to use them
- The sites are not a reliable source of information
- It is difficult to interpret the information provided
- I already have enough information from other sources to make choices
- I don't have access to the internet
- I did not know these websites existed
- I have never needed to use these websites

**Q27. What other internet websites involving ratings do you use? Tick all that apply.**

- Shopping websites (e.g. Amazon)
- Holiday websites (e.g. TripAdvisor)
- Car insurance websites (e.g. Compare The Market)
- Restaurants/venue websites (e.g. ViewLondon)
- Film websites (e.g. Rottentomatoes)
- Other (please specify).....
- I don't use any rating websites.

**Q28. What methods of rating do you feel are a useful form of feedback in these websites? Tick all that apply.**

- Star-rating out of 5
- Percentage scores
- Thumbs Up/Down
- Written comments from patients/users
- No preference

## SECTION G

We remind you that all personal data collected will remain confidential and is collected for academic purposes.

**Q29. What is your age? .....**

**Q30. What is your gender?**

Male  Female

**Q31. How would you describe your ethnicity?**

<input type="checkbox"/>	White – British	<input type="checkbox"/>	Other Asian – non-Chinese
<input type="checkbox"/>	White – Others	<input type="checkbox"/>	Black Caribbean

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

**Q32. What is your postcode? .....**

**Q33. How many other individuals do you live with? .....**

**Q34. Do you live with your parents?**

- Yes                       No

**Q35. What is/was your profession? .....**

- Unemployed                       Retired

**Q36. What is your level of pre-tax income?**

- 0
- <£15000 but >0                       £15,000-£35,000
- £35,000-55,000                       £55,000-£75,000
- £75,000-£95,000                       >£95,000

**Q37. What is your highest level of educational attainment?**

	GCSE		Other vocational degree
	A-Level		University degree
	BTEC		Postgraduate degree

**Q38. In the last year how many times have you had an outpatient hospital appointment?**

- 0 times                       1-3 times
- 4-5 times                       More than 5 times

**Q39. What is the sex of your GP?**

- Male                       Female

**Q40. How old is your GP?**

- <30 years
- 30-50 years
- >50 years

**Q41. What is the ethnicity of your GP?**

	White – British		Other Asian – non-Chinese
	White – Others		Black Caribbean

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

Q42. I cannot answer Q39, Q40, Q41 because I don't always see the same GP.

**This is the end of the questionnaire, thank you for your time.**

For peer review only

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1-2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2- 3
<b>Introduction</b>			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	8
		(b) Describe any methods used to examine subgroups and interactions	8
		(c) Explain how missing data were addressed	8
		(d) If applicable, describe analytical methods taking account of sampling strategy	NA
		(e) Describe any sensitivity analyses	NA
<b>Results</b>			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	8-11
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	18-23
		(b) Report category boundaries when continuous variables were categorized	NA
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	11-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	11
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	12

\*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).

1  
2  
3  
4  
5  
6  
7 **Who is More Likely to Use Doctor-Rating Websites, and Why?**  
8 **A Cross-sectional Study in London**  
9

10 **Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stavropoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum**  
11 **Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>**  
12  
13

14  
15  
16  
17 **Declaration:** All authors have completed the Unified Competing Interest form at  
18 [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author)  
19 and declare: no support from any organisation for the submitted work; no financial  
20 relationships with any organisations that might have an interest in the submitted work in  
21 the previous three years, no other relationships or activities that could appear to have  
22 influenced the submitted work.  
23

24 **Copyright statement:** The Corresponding Author has the right to grant on behalf of all  
25 authors and does grant on behalf of all authors, a worldwide licence to the Publishers and  
26 its licensees in perpetuity, in all forms, formats and media (whether known now or created  
27 in the future), to i) publish, reproduce, distribute, display and store the Contribution, ii)  
28 translate the Contribution into other languages, create adaptations, reprints, include within  
29 collections and create summaries, extracts and/or, abstracts of the Contribution, iii) create  
30 any other derivative work(s) based on the Contribution, iv) to exploit all subsidiary rights  
31 in the Contribution, v) the inclusion of electronic links from the Contribution to third party  
32 material where-ever it may be located; and, vi) licence any third party to do any or all of  
33 the above.  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



## Who is More Likely to Use Doctor-Rating Websites, and Why? A Cross-sectional Study in London

Matteo M Galizzi<sup>1</sup>, Marisa Miraldo<sup>2\*</sup>, Charitini Stavropoulou<sup>3</sup>, Mihir Desai<sup>4</sup>, Wikum Jayatunga<sup>4</sup>, Mitesh Joshi<sup>4</sup>, Sunny Parikh<sup>5</sup>

### Article summary

#### Article focus:

- To explore the awareness of the existence of doctor-rating websites and ~~its~~ their usage among a sample of respondents from London ~~the general population~~.
- To understand the main predictors of what makes people willing to use doctor-ratings websites.

#### Key messages:

- The share of ~~the general public~~ actual users of which uses doctor-rating websites is ~~still~~ quite low.
- ~~SElderly~~, subjects with white British background, as well as subjects with higher income are less likely to use doctor-rating websites.
- The doctor-patient relationship is a significant predictor of patients' intention to use ~~;~~ doctor-rating websites.

#### Strength and Limitations:

- Our study contributes to the literature of online health information where evidence on the determinants of people's willingness to use doctor-rating websites is limited.
- The main limitation of the study is that we use a convenience sample from one borough of London, UK and therefore results cannot be immediately generalised to the UK population.

### Abstract

**Objectives:** To explore the extent ~~at to~~ which doctor-rating websites are known and used among a sample of respondents from London ~~the general population~~. To understand the main predictors of what makes people willing to use doctor-ratings websites.

**Design:** A cross-sectional study.

**Setting:** The Borough of Hammersmith and Fulham, London, England.

**Participants:** 200 individuals from the borough.

**Main outcome measures:** The likelihood of being aware of doctor-rating websites and the intention to use doctor-rating websites.

**Results:** The use and awareness of doctor-rating websites is still quite limited. ~~Elderly,~~ ~~w~~White British subjects, as well as respondents with higher income are less likely to use doctor-rating websites. The Aspects of the doctor-patient relationship also plays a key role in explaining intention to use the websites: ~~the GP-patient gender concordance is associated with higher intention to use, the websites. Respondents who feel that their GP is a valuable source of clear information, and who are more satisfied with the level of choice of healthcare treatments, are less likely to use online rating websites. The doctor has both a "complementary" and "substitute" role with respect to Internet information.~~

Formatted: Font: Cambria, (Asian) Japanese, (Other) English (U.K.)

Formatted: Normal, Left

1  
2  
3  
4  
5  
6 **Conclusions:** Online rating websites can play a major role in supporting patients'  
7 informed decisions on which health care providers to seek advice from, thus potentially  
8 fostering patients' choice in health care. Subjects who seek and provide feedback on  
9 doctor-ranking websites, though, are unlikely to be representative of the overall patients'  
10 pool. In particular, they tend to over-represent opinions from ~~young~~, non white British,  
11 medium-low income patients who are not satisfied with their choice of the healthcare  
12 treatments and the level of information provided by their GP. Accounting for differences  
13 in the users' characteristics is important when interpreting results from doctor-rating sites.  
14

#### 15 Key messages

- 16 • The share of ~~the general public which uses~~ actual users of doctor-rating websites is  
17 ~~still~~ quite low.
- 18 • ~~Elderly, s~~Subjects with white British background, as well as subjects with higher  
19 income are less likely to use doctor-rating websites.
- 20 • The GP-patient gender concordance is associated with higher ~~-~~intention to use ~~;~~ the  
21 websites.
- 22 • Subjects who feel that their GP explains things clearly and is a valuable source of  
23 clear information, are less likely to use online rating websites.
- 24 • Subjects who feel that they are more satisfied with the level of choice of healthcare  
25 treatments are less likely to use online rating websites.

26  
27 <sup>1</sup> London School of Economics, LSE Health and Centre for the Study of Incentives in Health

28 <sup>2</sup> Imperial College Business School

29 <sup>3</sup> University of Surrey

30 <sup>4</sup> Imperial College School of Medicine

31 <sup>5</sup> King's College London

32 \*Corresponding author: Marisa Miraldo. Email: [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk)  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## INTRODUCTION

In recent years, both the NHS Plan<sup>1</sup> and the NHS Improvement Plan<sup>2</sup>, set out the changes required for the English NHS to become more patient-focussed. Greater patient involvement in the running of the NHS has gone hand in hand with the policymakers' drive to improve the quality of public healthcare services. The 'bottom-up' approach to a more patient-centred NHS has typically focused on three main areas: i) giving users more choice and personalisation; ii) making funding respond to users' choices; and iii) engaging users through greater involvement.<sup>3</sup> Lord Darzi's 2008 report "High Quality Care For All - The Next Stage Review"<sup>4</sup> acknowledged that improvements to the NHS should focus on improving the quality of services, and that the best way of achieving this would be to ensure that services are locally responsive to the needs of the community, for instance, by empowering providers and patients as decentralised decision-makers in order to foster a culture of continuous quality improvement and innovation.

Websites, such as the *NHS Choices* and *Dr Foster Intelligence*, have been developed with the explicit aim of informing patients about the services that the NHS provides and therefore allowing a better choice of physicians and treatments. In principle, doctor-rating websites can have a profound impact on public involvement and patients' choice, as they enable patients to make more informed decisions on where to seek healthcare, and thus to engage more often in active choices concerning their health. In practice, however, relative little evidence is available on whether, and to what extent, doctor-rating websites are actually known and actively used in the UK.

A study by the Kings Fund<sup>5</sup> explored the information sources used by patients in making decisions about where to receive care. Only 4% of the patients used the NHS Choices website, with the majority instead drawing information from their own experiences (41%), and advice from GP (36%). Similarly, a national survey on patients' choice by the Department of Health found that the NHS Choices website was only used by 5% of respondents.<sup>6</sup> These figures are consistent with the evidence from the US where usage of doctor rating websites is still quite low.<sup>7,8</sup> Moreover, very little is known about the profile of individuals who are more likely to make active use of these sites. Appleby and Alvarez<sup>9</sup> found that women in England desire patient choice more than men (69% to 56%), suggesting that women may also be more likely to use patient sources of information such as rating sites. This is in line with findings from the US where women and younger adults are more active 'online health information seekers'.<sup>10</sup>

The aim of this study is to contribute to fill these gaps by providing more direct evidence on, first, the extent to which doctor ratings websites are known and used among ~~the general public~~ a sample of respondents in a borough of London; and, second, the most significant predictors of the fact that people are willing to use doctor-ratings websites.

## METHODS

We conducted a self-administered survey to assess the extent and the determinants of i) the awareness of the existence of doctor-ratings websites; ii) the level of actual usage of those websites; iii) the intention to use doctor-ratings websites in the future.

### Questionnaire design

1  
2  
3  
4  
5  
6 Prior to the data collection a pilot study was conducted. The aim of the pilot was to gain  
7 an understanding of the practicalities associated with giving out questionnaires and  
8 collecting responses. After listening to feedback from pilot respondents, and looking at  
9 results from the pilot study, several changes were made to make the questionnaire easier to  
10 understand. The changes related to content, phrasing and ordering of questions.

11  
12 The content of the final questionnaire was based on findings from the preliminary  
13 literature review and was designed ~~to have~~in a number of sections (see Appendix for full  
14 questionnaire). In particular, section A focuses on the awareness of online rating websites,  
15 while section B assesses actual usage of online rating websites. Section C measures the  
16 willingness to use the online rating websites in the future, and explores which aspects of  
17 the healthcare providers and which sources of information are perceived as being  
18 important factors in making decisions about where to receive healthcare. Section D  
19 assesses the individual contribution to the online rating sites, while section E focuses on  
20 aspects of the doctor-patient relationship and attitudes and dimensions of patient choice.  
21 Finally section F controls for internet usage, while section G collects a broad range of  
22 socio-demographic characteristics.

23  
24 Closed questions were used, worded in a manner easy to understand. A limited number of  
25 responses were provided, either with binary options (e.g. yes or no), or with a numerical  
26 Likert scale ranging from 1 to 5, with a further option for “*Not sure*”.

27  
28 | A list of variables with a brief description is discussed in the [Variables-Statistical analysis](#)  
29 section and is summarised in Table 1 in the Appendix.

### 30 **Ethical approval, informed consent and confidentiality of responses**

31  
32 We completed the checklist for research ethics approval from Imperial College London.  
33 As interviews were intended to be conducted in public places among respondents from the  
34 general population, the study involved no risk or harm of any type to respondents, no link  
35 with clinical data was expected to take place, and no incentives were going to be paid to  
36 respondents, the study fitted all the criteria in the first stage checklist with no further  
37 formal application to the Imperial College Research Ethics Committee.

38  
39 At the beginning of each interview, interviewers showed credentials as research assistants  
40 at the University of London, informed respondents that their answers were anonymous  
41 and would remain strictly confidential, and that all responses and data were going to be  
42 treated statistically and used for the purposes of scientific research only. Informed consent  
43 by respondents was then given at the beginning of each interview.

### 44 45 46 **Data CollectionSample**

47  
48 The survey was conducted in the field by the researchers involved in the paper. The  
49 borough of Hammersmith and Fulham was chosen for the location of the field survey  
50 because it is a transport hub in Central West London, and hosts many offices and several  
51 major business centres. The four interviewers went to different public locations within the  
52 borough (underground stations, high street and residential areas) at different times during  
53 the day (early morning, midday and in the evening) and in different days of the week  
54 (including weekends). By covering different times and locations within the borough, we  
55 aimed at being able to approach both working and non-working members of the public.

1  
2  
3  
4  
5  
6 During the surveys in the field, the interviewers approached every third male and third  
7 female that would pass by them.  
8

9 Sample size calculations were based on the intended objective to look at the correlation  
10 coefficient between the likelihood of using the websites on the one hand, and a typical  
11 survey response, on the other. The minimum sample size to test the null hypothesis of no  
12 significant correlation between these two variables was calculated given the most  
13 conservative assumption that the correlation coefficient between the variables in the  
14 population was in the region of 0.2 (a “low” effect size, the variance of one variables  
15 accounting for just 4% of the variance of the other). Under the assumptions that all  
16 variables are normally distributed, a bi-directional test (both positive and negative  
17 correlation were expected) with 95% significance level reaches a standard 80% power  
18 level at a minimum sample of  $n=200$  subjects.<sup>11</sup> We thus targeted a sample size of 200  
19 respondents. The envisaged target was then readily achieved, since only 68 subjects who  
20 were initially approached refused to take part to the survey, with a final response rate of  
21 74%.  
22  
23  
24

## 25 Statistical analysis

26  
27 | Besides a correlation analysis, ~~We~~ we have carried a multiple regression analysis which  
28 aims to explore the determinants of i) being either aware or not of doctor rating websites;  
29 and ii) the individual intention of using these websites in the future.  
30

31 The dependent variable in the first case is modeled as a binary variable (*Awareness*)  
32 taking values 1 or 0 for the respondents who reported to be aware or unaware of the  
33 websites, respectively. The second dependent variable is instead modeled as a discrete  
34 ordered variable (*IntentionToUse*) taking values 1, 2, and 3 for subjects reporting to be  
35 ‘not likely’, ‘quite likely’, and ‘likely’ to use the websites in the future, respectively.  
36

37 The explanatory variables ( $X_i$ ) include the variables described in Table 1, namely:  
38 individual socio-demographic characteristics; a set of variables on the characteristics of  
39 the healthcare providers that the respondents consider important for making their  
40 decisions on where to receive health care; a set of variables on the sources of information  
41 that are important in making decisions about where to receive health care; two dummy  
42 variables that capture whether the patient’s gender and age are the same, or within a  
43 comparable range, respectively, than the gender and age of her GP; a set of variables that  
44 describe the respondents’ feelings about their relation with their doctor; a variable  
45 indicating the level of participation of the respondents in their GPs’ decisions; a set of  
46 variables on patients’ satisfaction with the level of choice in their healthcare decisions; a  
47 dummy variable controlling for whether the subjects had access to internet at home or at  
48 work; a variable on awareness of the existence of doctor-rating websites; and a variable on  
49 whether the subject always asks to see the same GP (see Table 1 for variables’ details).  
50 The choice of the explanatory variables was further informed by the bivariate correlation  
51 analysis reported in Table 2 in the Appendix.  
52

53 We employed a binary logistic and an ordered logistic model to fit the *Awareness* and the  
54 *IntentionToUse* discrete variables, respectively, to ensure a reasonable comparability  
55 between the empirical results obtained for the two set of regressions. The two models, in  
56

57 6  
58  
59  
60

fact, only differ in the number of values that the dependent variables can take, while the underlying structure of the error terms follows the same standardized logistic distribution. The logistic specification is particularly appealing because its results can be readily expressed in terms of odds ratio. We have, however, conducted a robustness check by replicating the multiple regression analysis using the alternative binary and ordered probit specifications, ~~which assume a Gaussian error term and present results in terms of estimated coefficients instead of odds ratio~~. The two set of regressions provide consistent estimates and results which are qualitatively fully aligned. Results of the probit specifications are available, upon request, from the authors.

All the regression analysis has been conducted using STATA v.11.

## RESULTS

### The sample and descriptive statistics

Descriptive statistics of all the dependent and independent variables for the resulting sample of respondents to our survey are provided in detail in Table 1, and here we briefly report their main aspects.

Our sample consisted of 200 subjects. Comparing it with the Census data for the borough the mean age of our sample was slightly older than that for the borough (39.57 years compared to 35.2 years).<sup>1312</sup> Our sample however was closer to the national mean age of 38.5 years. The range of ages seems to show a positive skew, with a greater frequency of people aged 40 years and under. This is consistent with the 2001 census data for Hammersmith and Fulham which showed the borough contained a larger proportion of young people aged 20-29 (23.8%) than the rest of England (12.66%).<sup>1312</sup>

Also, the sample had a slightly greater proportion of females than the borough (54.44% to 52% respectively), and a lower proportion of 'White British' ethnicity (48.79% compared to 58% for the borough).<sup>1312</sup> This is also significantly lower than figures for England, White British accounting for 87% of the population.<sup>1312</sup> The sample contained 28.99% non white respondents. This is higher than the 2001 census data for Hammersmith and Fulham which was 22% and significantly higher than the figures for England, showing non white ethnic groups accounting for 9% of the total population.<sup>1243</sup> Our sample, therefore, allows controlling for high heterogeneity in ethnic background even with a limited sample size.

Regarding working status, 141 individuals were workers (ten of which reported to be currently unemployed), 33 students, 9 officially unemployed and 6 retired. Eleven respondents did not report their working status. The proportion of subjects who were not currently working, as given by the sum of the respondents who reported to be unemployed, retired, or students, indeed amounts to 29% of the sample. The majority of actively working respondents reported an income within the £15-35,000 bracket.

Our sample had a high percentage of people with higher level qualifications: 46.24% of the sample had a university degree and 27.96% had a postgraduate degree. This is reflective of Hammersmith and Fulham, where 45% of the population have a qualification of degree level or higher, a figure which is significantly higher than in England, where only 19.8% have a degree or higher qualification.<sup>1243</sup>

Formatted: Normal

## Results on awareness

Only 29 of our respondents were aware of the doctor-rating websites they were asked about **and only 6 reported to have used them.**

In Table 2 we present the set of bivariate correlations between the fact of being aware of the websites and each of the variables collected in the survey. As it can be seen, there is positive correlation between having an internet access, or being aware of the NHS Choose and Book system, and being aware of the doctor rating websites. Age exhibits a negative correlation, while the gender concordance with the GP, shows a positive correlation. Positive correlations with the awareness of doctor rating websites also hold for respondents who think that those websites are important sources of information, or who see accessibility and financial performances of hospitals important factors in making decisions where to seek healthcare.

[Table 2 in here]

In Table 3 we present the estimate results of four different specifications of the binary logistic regression for the dependent variable *Awareness* with different sets of regressors, which are presented in terms of the odds ratio, together with the standard errors, and levels of significance.

[Table 3 in here]

Among the demographic factors, age and ethnicity are the only significant variables. Older individuals are less likely to be aware of the rating websites, which does not constitute a surprise, as they are usually less familiar with the use of internet in general. Moreover, in most specifications, white British and white non-British respondents appear less likely to be aware of the websites.

Among the broader socio-demographic factors, only income is sometimes (marginally) significant, pointing to the fact that respondents with higher reported levels of income tend to be less aware of the websites, while neither education or gender turn out to be significant predictors of awareness.

Looking at the characteristics of the providers that respondents consider important in making their decisions on where to receive healthcare, in one specification the reputation of the doctor has a strong positive effect, while both clinical and financial performance rates of the providers show negative significant effects. Thus, the respondents who consider the reputation of the doctor important in deciding where to receive care are more likely to be aware of the rating websites, while this is less often the case for respondents putting a higher weight on financial or clinical performance ratings.

Concerning the sources of information, respondents who consider the hospital statistics important in deciding where to receive care, turn out to be more likely of being aware of the rating websites, with an effect which is particularly significant and quite remarkable in terms of odds ratio.

1  
2  
3  
4  
5  
6  
7 Furthermore, although in one specification the respondents who feel that their GPs spend a  
8 sufficient time in their consultation are less likely to be aware of the internet rating  
9 websites, both the statistical significance and the estimated odds ratio do not appear robust  
10 across specifications. Although all other variables on doctor-patient relationship were not  
11 significant, whenever included among the regressors, the gender match between the GP  
12 and the patient predicts higher awareness of the website ratings, with a noticeable effect as  
13 evident by the reported value of the odds ratio.

14  
15 | As mentioned above, ~~F~~from those that were aware of the existence of doctor-rating  
16 websites only 6 have reported to have used these websites. In light of this low usage rate,  
17 and of the consequent limitations of conducting statistical estimations with very little  
18 variation in the dependent outcomes, we have thus focused the rest of the analysis on the  
19 determinants of the intention to use, rather than actual usage of, doctor rating websites.

### 20 21 22 23 **Results on the likelihood to use online rating websites**

24 In Table 2 we present the set of bivariate correlations between the intention to use the  
25 doctor rating websites and each of the variables collected in the survey. As it can be  
26 noticed, there is a positive correlation between having internet access, and being aware of  
27 the doctor rating websites. Both the age and the gender concordance with the GP show a  
28 positive correlation with the intention to use. Positive correlations with the willingness to  
29 use doctor rating websites also hold for respondents who think that those websites, or  
30 hospital statistics, are important sources of information. Also the fact that respondents  
31 believe that online rating is a reliable measure is clearly correlated with the intention to  
32 use them. Finally, positive correlations also hold for respondents who feel that their doctor  
33 has time to dedicate to them, or who see several aspects of healthcare providers - such as  
34 reputation, clinical and financial performances, waiting lists, accessibility – as important  
35 factors when making decisions where to seek healthcare.

36  
37 In Table 4 we present the estimate results of six different specifications of the ordered  
38 logistic regression for the dependent variable *IntentionToUse* with different sets of  
39 regressors, which are presented in terms of the odds ratio, together with the standard  
40 errors, and levels of significance.

41 [Table 4 in here]

42  
43 Concerning socio-demographic variables, it turns out that white British, as well as  
44 respondents who reported income in higher brackets, said they were less likely to use  
45 doctor-rating websites. Moreover, we do not find any effect of education, age and gender  
46 of the respondents on the likelihood of their intention to use (the results of the  
47 specifications including the age and gender variables are not reported in the table for the  
48 sake of space but are available from the authors upon request).

49  
50 Looking at the characteristics of the healthcare providers that respondents perceived as  
51 important while making decisions where to receive healthcare, our data suggest that those  
52 who consider clinical performance and doctor reputation (in most specifications) as  
53 important factors, are more likely to use doctor-rating websites. These results are  
54 consistent with the nature of the information provided in these websites. Also, and quite



intuitively, subjects who consider the familiarity with their doctor an important factor to decide where to seek healthcare, tend to be less likely to intend to use websites.

Concerning the role of the different sources of information on the decisions of where to seek healthcare, respondents who see published hospital statistics as important sources of information are more likely to use the rating websites. On the other hand, ~~and interestingly~~, those for whom GP advice is an important source of information for decision making are less likely to use doctor-rating websites.

Also the nature of the doctor-patient relationship seems to play a key role in explaining whether respondents intend to use online rating websites. First, patients with GPs of the same gender tend to be more likely to use the websites. Second, respondents for whom the doctor is able to listen to them, and who perceive the nature of the relationship with their GP as friendly, also tend to be more likely to use the websites. Third, respondents who feel that their doctor explains things clearly are less likely to use online rating websites. Fourth, it also transpires that the more autonomy patients have in their healthcare decisions, the more likely they are to be willing to use the rating websites.

Finally, concerning, the interaction between levels of satisfaction for the healthcare services within the NHS, and the intention to use doctor-rating websites, ~~it is interesting to~~ note that those that have reported to be more satisfied with the level of choice of GP, and with the amount of choice of the hospital to receive outpatient appointments, are more likely to use these websites. On the other hand, the respondents that are more satisfied with the level of choice of treatments are less likely to use the websites.

## DISCUSSION

In this section we briefly discuss our main findings on the determinants of the intention to use doctor rating websites and the level of awareness and actual usage of these websites. Results show that socio-demographic characteristics (in particular income and ethnicity) and the doctor patient relationship are significant determinants of the intention to use these websites. Regarding the latter we further show that, from a patient's perspective, the doctor and the Internet can be seen as being both "complementary" and "substitute" sources of information. Yet, we find that awareness and usage of doctor rating websites is low in our sample. In what follows we will discuss these results and relate them to evidence from the literature.

### Intention to use

On the socio-demographic variables the results that show that white British and respondents who reported income in higher brackets said that they were less likely to use doctor-rating websites, is partly in contrast to what found by the previous literature<sup>12,15,16,13,14,15</sup> and can signal that white British subjects and respondents with higher self-reported income may feel less in need of checking online doctor ratings, perhaps because they may also have private, or employer-paid, health insurance schemes, or because they are in the position of directly accessing alternative sources of information through their networks of acquaintances. Another possible explanation may be that white British individuals may trust less information that exists online and they have more

1  
2  
3  
4  
5  
6 concerns about confidentiality issues as shown in a study among different socio-economic  
7 groups in the US by Brodie et al.<sup>1617</sup> As the estimated effect of these variables appear to be  
8 robust across all empirical specifications, these findings seem to suggest that online  
9 doctor-rating websites are likely to be particularly attractive to subjects with non-white  
10 British ethnicity and less favoured economic background.

11  
12 On the other hand, the lack of statistical significance in the ordered logit estimates, seems  
13 to suggest that, while age can be a significant factor in explaining the awareness of  
14 Internet for health information, it is not significantly explaining the intention to use  
15 doctor-rating websites once subjects are made aware of their existence. The analogous  
16 lack of significance for the respondents' gender, on the other hand, does not support the  
17 view that women in the UK may be more likely to use patients' sources of information  
18 and rating websites, although they have been found to desire patient choice more than men  
19 (69% to 56%).<sup>9</sup> Both results differ from the findings from the literature on the use of  
20 online information. The literature has shown that socio-demographic characteristics are  
21 major determinants of usage of online health information. In particular women and  
22 younger adults are more active 'online health information seekers'.<sup>10,18-21,17-20</sup> Education  
23 has also been found to determine usage of online and offline health information. Cotton  
24 and Gupta<sup>1516</sup> and Diaz et al.<sup>1213</sup> carried out research into the characteristics of online and  
25 offline health information seekers and found that less educated individuals were less likely  
26 to be users of online health information.

27  
28 Therefore even though, according to our findings, intentions to use do not differ  
29 significantly across all socio demographic characteristics, actual usage may be greatly  
30 determined by access rather than only by intention to use, with the former substantially  
31 differing according to socio-economic and demographic characteristics. That is, there may  
32 exist income-, education- or age-related barriers to actual access that prevent individuals  
33 from using doctor rating sites even though their intentions to use them are similar.

34  
35 From the perspective of the doctor-patient relationship, the finding that patients with GPs  
36 of the same gender tend to be more likely to use the websites is of particular interest, and  
37 it is consistent with the analogous effect found for the likelihood of being aware of those  
38 websites. Considered together these findings point to the possible explanation that the  
39 doctor and the Internet may sometimes be seen by patients as "complementary", rather  
40 than alternative, information channels.<sup>4514</sup> This interpretation is further confirmed by the  
41 finding that respondents for whom the doctor is able to listen to them, and who perceive  
42 the nature of the relationship with their GP as friendly, also tend to be more likely to use  
43 the websites.

44  
45 The doctor-patient gender concordance, in fact, has often been reported in the literature as  
46 a factor associated with higher patient satisfaction with the consultation as well as better  
47 outcomes.<sup>2221</sup> If we interpret the gender match variable as an indication of satisfaction  
48 with the consultation, our finding indicates that the intention to use (as well as being  
49 aware of) the doctor-rating websites is not necessarily the result of a poor consultation.  
50 Instead, the Internet and the doctor are likely to be seen as complementary, rather than  
51 alternative, information channels. This could explain why patients that consider hospital  
52 statistics as a good source of information are more likely to use these websites. Indeed this  
53 type of information might not be provided by the doctor in a consultation.

54  
55 Indeed, a study by Stevenson and colleagues<sup>2224</sup> shows that although patients use the  
56 Internet increasingly more, they show no intention of doing so with the aim of disrupting

1  
2  
3  
4  
5  
6 the existing balance of roles during the doctor-patient consultation. They all mentioned the  
7 Internet as an additional resource of health and healthcare information. Other evidence  
8 suggests that patients with hypertension who search for more information on the Internet,  
9 in addition to that they receive from their doctor, may be more engaged in their treatment,  
10 and therefore more willing to adhere to medication prescribed by them.<sup>2325</sup>

11  
12 Finally, the positive association between willingness to use doctor rating websites and  
13 levels of satisfaction with the level of choice of GP, and of outpatient appointments in the  
14 hospital, can be considered as reinforcing the above discussed interpretation that some  
15 dimensions of the doctor-patient relationship may be “complementary” with online  
16 information. For instance, patients who are more satisfied with their GP because they feel  
17 the latter is more friendly and empathic may also be more likely to engage more actively  
18 with health and healthcare information more generally. These results, together with the  
19 finding that the respondents who are more satisfied with the level of choice of treatments  
20 are less likely to use the websites, suggest that the choice of doctors and providers may be  
21 seen as only instrumental for the choice of treatment, and therefore respondents that are  
22 happy with treatment choice levels are less likely to shop around for different doctors’  
23 opinions.

24  
25 On the other hand, there may be other dimensions in the patient-doctor relationship which  
26 seem to rather point to a “substitute” relationship with information on the Internet. For  
27 instance, the fact that respondents who feel that their doctor explains things clearly and  
28 consider the advice given by the GP as being important are less likely to use online rating  
29 websites, suggests that when they are generally more satisfied with the feedback provided  
30 by their doctor they are less concerned about finding about alternative doctors and  
31 compare them with their current GP.

32  
33 This result on a “substitute relationship” is consistent with previous evidence by Diaz and  
34 colleagues<sup>1342</sup> that found that 11% of their respondents said they would rather use the  
35 Internet ‘instead of seeing or speaking with their doctors’, and that 59% of respondents  
36 ‘did not discuss information with their doctors’. It also seems in line with the study by  
37 McMullan<sup>1445</sup> that indicates that patients who become dissatisfied with the information  
38 provided to them by the health professionals are more likely to seek confirmation of the  
39 information given and additional information on the Internet.

40  
41 Our findings that online information can be used not only as “substitute” but also, and  
42 perhaps mainly, as “complementary” to several dimensions of the doctor-patient  
43 relationship do not seem to entail any particular evidence suggesting that online ratings  
44 may put in danger the doctor-patient relationship, an important aspect which has been  
45 raised in the literature.<sup>26,2724,25</sup> The “complementarity” findings, in particular, seem  
46 consistent with the evidence from the US which shows that the vast majority of the  
47 reviews by patients are generally rather positive.<sup>7,8,2628</sup> Taken together, this evidence can  
48 be seen as providing little support to the related concern that the likeliest to use online  
49 ratings and enter actual comments may be the most disgruntled patients.<sup>2729</sup>

50  
51 As for the other aspects of the patient-doctor relationship, the finding that the more  
52 autonomous patients are in their healthcare decisions, the more willing they are to use the  
53 rating websites is also consistent with previous evidence: a study by McMullan,<sup>4514</sup> for  
54 instance, reports that patients would seek health information before a consultation ‘to  
55 manage their own healthcare independently’. These may be the type of people who are

1  
2  
3  
4  
5  
6 'more likely to be health-oriented' or 'health conscious', and therefore be more proactive  
7 in consultations.<sup>2823</sup>  
8  
9

### **Awareness and actual usage**

10 Only 15% of our sample were aware of the existence of these websites, indicating that the  
11 awareness and, consequently, usage of these online sources is still quite limited in the UK,  
12 although significantly higher than what the previous studies have shown.<sup>5</sup>  
13  
14

15 Concerning the low reported rate of active usage of doctor rating websites, the finding is  
16 not too surprising given that the survey was done among a sample of respondents from the  
17 general population: the reason why many more respondents were aware of the online  
18 ratings than did actually use it may simply be because those subjects did not actually need to  
19 see a doctor.  
20

21 These figures are substantially in line with previous evidence brought forward from the  
22 literature for the UK.<sup>5,6</sup> A slow uptake of online ratings has also been reported in the US.  
23 It is indicative that only 6% of Americans were aware of Hospital Compare, the quality  
24 reporting website maintained by the Centres for Medicare and Medicaid Services  
25 (CMS).<sup>2914</sup> Gao et al.<sup>8</sup> analysed 386,000 national ratings from 2005-2010 in the US and  
26 showed that only 1 out of 6 physicians among those included in the study had received  
27 some rating. Lagu, Hannon, Rothberg et al.<sup>7</sup> also reported a low average number of ratings  
28 per physician.  
29

30 The fact that even in the US, a more market-oriented health system, the use of similar sites  
31 is not much higher may suggest that the slow uptake in the UK cannot be attributed only  
32 to the early stage of the "choice" model. Considered together these results may pose  
33 concerns on the reasons and consequences of the lack of patient awareness and usage of  
34 online health related information.  
35

36 Previous studies in the US have reported a number of reasons behind this slow uptake,  
37 including i) the preference for more traditional information channels, such as  
38 recommendations by family and friends; ii) the lack of time; and iii) in many cases the fact  
39 that people do not recognise that the quality of care may vary.<sup>2725</sup>  
40

41 As for the UK, our study confirms that not only awareness of rating websites is still  
42 limited among a sample of respondents the general public in London, but awareness and  
43 willingness to use per se do not seem a sufficient condition to guarantee active usage. This  
44 poses a double challenge from a clinician and health policy perspective. In fact, on the one  
45 hand, the documented correlation between online ratings and other measures of healthcare  
46 quality, including survey-based ratings and clinical quality indicators,<sup>30,31</sup> necessarily  
47 requires that patients have already gone through three preliminary hurdles, namely i) being  
48 aware of, ii) having effective access to, and ii) being active users of the doctor rating  
49 websites. If the ultimate goal is indeed the continuous enhancement of healthcare quality,  
50 the effective removal of this ~~double~~triple hurdle is likely to become the next priority to  
51 guarantee the full spread of online rating website.  
52

53 On the other hand, while appropriate online and offline informational campaigns are likely  
54 to overcome the first hurdle, thus effectively raising patients' awareness of online ratings  
55 as a potential source of information on provider quality, informational campaigns alone  
56 can fail to grant effective access and trigger actual changes in behaviour. Alike in several  
57  
58  
59  
60

1  
2  
3  
4  
5  
6 other health contexts, in particular, ‘nudging’ behaviour may be difficult as a mere  
7 consequence of accessing more information.  
8

9 If this is the case, other avenues should be explored to increase the active usage of rating  
10 websites by patients who are already aware of them. For instance, the evidence brought  
11 forward by the present study confirms the importance of the doctor-patient relationship as  
12 a factor determining individuals’ awareness of and willingness to use online ratings<sup>7, 25, 32-</sup>  
13 3527, 33-36 and suggests that tailored behavioural interventions based on the doctor-patient  
14 relationship have the potential to help patients to overcome the last hurdle and actively  
15 engage with online ratings.  
16

### 17 Limitations of the study

18 The convenience field survey was considered the most appropriate administration mode to  
19 involve a sample of respondents from the general population. An online survey, in fact, by  
20 exclusively reaching the segment of active internet users, would have failed to address the  
21 main goal of the study.:-

22 As common in field surveys of this type, the convenience sampling tended to over-  
23 represent respondents who were currently not working, or were at home:

24  
25  
26 However, while dictated by practical issues, the convenience sampling is a limitation of  
27 the study, and tends to over-represent respondents who are currently not employed, such  
28 as unemployed, retired and students. Also the fact that the study was conducted in only  
29 one borough of London limits the possibility to immediately generalise the findings to the  
30 broader UK population.

31  
32 In an attempt to make such limitations of smaller concern to enhance the external validity  
33 and generalisability of the analysis, we have i) chosen a borough which comprises a mix  
34 of both affluent and deprived neighbourhoods from heterogeneous ethnic backgrounds; ii)  
35 conducted surveys in the field at different public locations and at different times of the  
36 day and of the week to approach both working and non-working members of the public;  
37 and iii) controlled for a wide range of socio-demographic measures in the statistical  
38 analysis.  
39

### 40 41 42 **CONCLUSIONS**

43  
44 By collecting a broad range of information on the socio-demographic characteristics of the  
45 respondents, their views and perceptions of the most important aspects of healthcare  
46 quality, patient choice, and doctor-patient relationship, the study explicitly explores the  
47 usage doctor-rating websites, the determinants of respondents’ awareness of the doctor  
48 ratings websites, and of their intention to use the sites in the future.  
49

50 This study brings forward direct evidence suggesting that the awareness and actual usage  
51 of doctor-rating websites in the UK remains particularly low. The main finding suggests  
52 that the doctor-patient relationship plays a key role in explaining intention to use the  
53 websites and that the doctor has both a “complementary” and “substitute” role with  
54 respect to Internet information.  
55

1  
2  
3  
4  
5  
6  
7 The existence of both “substitute” and “complementary” effects between the doctor-  
8 patient and the Internet information channels is not at all conflicting. In fact, they both  
9 indicate that the level of concordance achieved during the consultation is likely to define  
10 whether or not individuals will seek for further information channels, such as the Internet.  
11

12 The findings of our study thus contribute also to the wider debate on the inter-  
13 relationships between Internet usage and the doctor-patient relationship.<sup>7,27,28,33-36,25-26,32-35</sup>

14 The argument, sometimes addressed by the previous literature, that information on the  
15 Internet can threaten the trust relationship and the balance of roles between doctors and  
16 patients, seems a concern which is not supported by our evidence. If any, a potential  
17 challenge to the doctor-patient relation can only affect the patients who already feel  
18 dissatisfied with the ability of their doctor to listen to them and provide them enough  
19 information regarding their condition, or with the level of their choice for healthcare  
20 treatments.  
21

22 The above, however, can hardly be seen as a serious threat by those who advocate a  
23 greater choice by patients. On the contrary, if the latter is indeed a priority in the health  
24 policy agenda, online information on healthcare providers should be seen as a challenging  
25 opportunity to enhance patients’ choice in healthcare, and public engagement with health  
26 information, especially for the less favoured segments of the population. Indeed, our  
27 findings suggest that subjects of non-white background and with lower income are more  
28 willing to use online ratings.  
29

30 Finally, our study highlights that subjects who use doctor rating websites are unlikely to  
31 be representative of the overall patients’ pool. In particular, they tend to over-represent  
32 opinions from non-white British, medium-low income patients who are not satisfied with  
33 their choice of healthcare treatments. Accounting for differences in the users’  
34 characteristics is important when interpreting results from doctor-rating sites and when  
35 informing interventions that aim at enhancing the public engagement with health  
36 information on the Internet, and the representativeness of the users who seek and provide  
37 feedback online.  
38

39  
40 **Data sharing:** technical appendix, statistical code and dataset available from the  
41 corresponding author at [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk). Consent for data sharing was not  
42 obtained but the presented data are anonymised and risk of identification is low.  
43

44 All authors had full access to all the data in the study and take responsibility for the  
45 integrity of the data and the accuracy of the data analysis.  
46

47  
48 **Funding:** this piece of work has not received any specific funding.  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## REFERENCES

1. [Department of Health. The NHS Plan: a plan for investment, a plan for reform. Crown 2000. Cm 4818-I.](#)
2. [Department of Health. The NHS Improvement Plan: Putting people at the heart of public services. London: The Stationery Office 2004. Cm 6268.](#)
3. [Department of Health. Creating a patient-led NHS: Delivering the NHS Improvement Plan. London: The Stationery Office 2005.](#)
4. [Department of Health. High Quality Care For All: NHS Next Stage Review final report. London: The Stationery Office 2008. Cm 7432.](#)
5. [Dixon A, Robertson R, Appleby J, et al. Patient Choice. London: The Kings Fund 2010 \[http://www.kingsfund.org.uk/publications/patient\\\_choice.html\]\(http://www.kingsfund.org.uk/publications/patient\_choice.html\)](#)
6. [Department of Health. Report of the National Patient Choice Survey, England. Crown 2008.](#)
7. [Lagu T, Hannon NS, Rothberg MB, et al. Patients' Evaluations of Health Care Providers in the Era of Social Networking: An Analysis of Physician-Rating Websites. J Gen Intern Med 2010;\*\*25\*\*\(9\):942-6.](#)
8. [Gao GG, McCullough JS, Agarwal R et al. A Changing Landscape of Physician Quality Reporting: Analysis of Patients' Online Ratings of Their Physicians Over a 5-Year Period. J Med Internet Res 2012; \*\*14\*\*\(1\):e.38.](#)
9. [Appleby J, Alvarez A. Public Responses to NHS Reform. In British Social Attitudes Survey 22nd Report. London: Sage Publications 2005.](#)
10. [Ybarra M, Suman M. Help seeking behavior and the Internet: A national survey. Int J Med Inform 2006;\*\*75\*\*\(1\): 29-41.](#)
11. [Cohen J. Statistical Power Analysis for the Behavioural Sciences. Academic Press, New York and London 1969.](#)
12. [Office for National statistics. 2001 Census: Key Statistics. 2001. Available from: <http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.doa=3&b=276755&c=hammersmith&d=13&e=15&g=334516&i=1001x1003x1004&m=0&r=1&s=1273150763921&enc=1&dsFamilyId=47>](#)
13. [Diaz JA, Griffith RA, Ng JJ, et al. Patients' use of the Internet for medical information. J Gen Intern Med 2002;\*\*17\*\*\(3\): 180-185.](#)
14. [McMullan M. Patients using the Internet to obtain health information: how this affects the patient-health professional relationship. Patient Educ Couns 2006;\*\*63\*\*\(1-2\): 24.](#)
15. [Cotten SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. Soc Sc Med 2004;\*\*59\*\*\(9\): 1795-1806.](#)
16. [Brodie M, Flournoy RE, Altman DE, et al. Health information, the Internet, and the digital divide. Health Affairs 2000; \*\*19\*\*\(6\): 255-265.](#)
17. [Health on the Net Foundation. HON's fourth survey on the use of the Internet for medical and health purposes.1999.](#)
18. [Fox L, Rainie J, Horrigan A, et al. The online healthcare revolution: How the web helps Americans take better care of themselves, Pew Internet and American Life Project, 2000.](#)
19. [Baker L, Wagner TH, Singer S, et al. Use of the Internet and e-mail for health care information. JAMA 2003; \*\*289\*\*\(18\): 2400-6.](#)
20. [Wald HS, Dube CE, Anthony DC. Untangling the Web-The impact of internet use on health care and the physician-patient relationship. Patient Educ Couns 2007; \*\*68\*\*\(3\): 218-224.](#)

21. Bertakis KD. The influence of gender on the doctor-patient interaction. *Patient Educ Couns* 2009;**73**(3): 356-60.
22. Stevenson FA, Kerr C, Murray E, et al. Information from the Internet and the doctor-patient relationship: the patient perspective – a qualitative study. *BMC Fam Pract* 2007;**8**: 47.
23. Stavropoulou C. Perceived information needs and non-adherence: evidence from Greek patients with hypertension. *Health Expect* 2012;**15**(2): 187-196.
24. McCartney M. Will doctor rating sites improve the quality of care? *BMJ* 2009: **338b** 1033.
25. Lagu T and Lindenauer PK. Putting the public back in public reporting of health care quality. *JAMA* 2010;**304**(15):1711-1712.
26. López A, Detz A, Ratanawongsa N, et al. What Patients Say About their Doctors Online: A Qualitative Content Analysis. *J Gen Intern Med* 2012;**27**(6):685-92.
27. Wachter B. The patient will rate you now. 2012 Available at: <http://community.the-hospitalist.org/2012/03/19/the-patient-will-rate-you-now>
28. Dutta-Bergman MJ. Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. *J Med Internet Res* 2004;**6**(2): e15.
29. Kaiser Family Foundation, 2008 Update on consumers' views of patient safety and quality information. Kaiser Family Foundation. <http://www.kff.org/kaiserpolls/posr101508pkg.cfm>
30. Greaves F, Pape U, King D, et al. Associations between internet-based patient ratings and conventional surveys of patient experience in the English NHS: an observational study. *BMJ Qual Saf* 2012; **21**: 600-605.
31. Greaves F, Pape UJ, King D, et al. Associations between Web-based patient ratings and objective measures of hospital quality. *Arch Intern Med* 2012;**172**: 435-436.
32. Nwosu CR, Cox BM. The impact of the Internet on the doctor-patient relationship. *Health Informatics Journal* 2000;**6**(3): 156-161.
33. Broom A. Virtually He@lthy: The Impact of Internet Use on Disease Experience and the Doctor-Patient Relationship. *Quality Health Research* 2005;**15**(3): 325-345.
34. Gorrindo T. Web searching for information about physicians. *JAMA* 2008; **300**(2): 213.
35. Malone M, Mathes L, Dooley J et al. Health information seeking and its effect on the doctor-patient digital divide. *Journal of Telemedicine and Telecare* 2005; **11** (Suppl.1): S1:25-28.



## Appendix

Table 1 Variable description and descriptive statistics

Variable	Obs	Mean	Std. Dev
<b>Awareness (<i>Awareness</i>) (0=no, 1=yes)</b>	200	0.142	0.350
<b>Intention to use (<i>IntentionToUse</i>)</b>	199	2.136	0.743
Not likely	43		
Quite likely	86		
Likely	70		
<b>Important factors in making decisions (1=not important at all, 5=very important)</b>			
Waiting lists ( <i>HC_Waiting</i> )	198	3.818	1.165
Rates of hospital-acquired complications ( <i>HC_HospComp</i> )	188	3.761	1.193
Clinical performance ( <i>HC_Clinical_Performance</i> )	189	4.037	1.136
Closeness to home ( <i>HC_CloseHome</i> )	200	3.683	1.265
Familiarity with the doctor ( <i>HC_Familiarity</i> )	194	3.237	1.306
Financial performance of the hospital ( <i>HC_FinPerform</i> )	191	2.387	1.164
Reputation of the doctor ( <i>HC_GP_Reputation</i> )	199	3.980	1.137
Accessibility and parking facilities ( <i>HC_Access</i> )	192	2.656	1.321
Past experience with the provider ( <i>HC_PastExp</i> )	193	3.544	1.311
<b>Important sources of information in making decisions (1=not important at all, 5=very important)</b>			
GP advice ( <i>SI_GP_Advice</i> )	198	4.071	1.030
Published hospital statistics ( <i>SI_HospStat</i> )	183	2.934	1.193
Online doctor rating websites ( <i>SI_DoctorRating</i> )	178	2.315	1.204
Personal experiences in the past ( <i>SI_PastExp</i> )	192	4.234	1.004
Feedback from family/friends ( <i>SI_Family</i> )	194	4.149	0.924
<b>I feel the doctor...</b>			
...listens (0=no, 1=yes) ( <i>DOC_Listens</i> )	200	0.575	0.496
...has time (0=no, 1=yes) ( <i>DOC_Time</i> )	200	0.410	0.493
...explains (0=no, 1=yes) ( <i>DOC_Explains</i> )	200	0.555	0.498
...is friendly (0=no, 1=yes) ( <i>DOC_Friend</i> )	200	0.445	0.498
... Is someone I can trust (0=no, 1=yes) ( <i>DOC_Trust</i> )	200	0.550	0.499
<b>I feel that online rating is a reliable measure (1=very unreliable, 5=very reliable) (<i>Reliable</i>)</b>	141	2.759	1.055
<b>How actively do you participate with your GP in making decisions (<i>Participation</i>)</b>	193		
My doctor always makes decisions for me	2		
I like to know the options available but still let my doctor decide for me	13		
My doctor and I make the decisions together	25		
I make decisions for myself, after considering the advice of my GP	65		
I always make my own decisions, independently of the advice of my GP	75		
I make decisions with my parents/spouse/relatives	13		
<b>Satisfied with the current level of choice of... (1 = strongly dissatisfied, 5 = strongly satisfied)</b>			
...GP ( <i>SAT_C_GP</i> )	173	3.451	1.138
...hospital ( <i>SAT_C_Hosp</i> )	152	3.493	1.055
...doctor ( <i>SAT_C_Doc</i> )	139	3.252	1.022
...treatment ( <i>SAT_C_Treatment</i> )	148	3.554	0.928
...time spent ( <i>SAT_C_Time</i> )	168	3.179	1.123

<b>Ethnicity</b>			
<b>White British (0=no, 1=yes) (WhiteBritish)</b>	200	0.488	0.501
<b>White Other (0=no, 1=yes) (WhiteNonBritish)</b>	200	0.222	0.417
<b>Highest level of educational attainment* (Education)</b>			
<b>1 if GCSE</b>	12		
<b>2 if A-Level/BTEC/Vocational</b>	36		
<b>3 if University undergraduate degree</b>	86		
<b>4 if Postgraduate Degree</b>	52		
<b>Age (years) (Age)</b>	199	39.572	16.083
<b>Gender (Gender)</b>			
<b>Female (=1)</b>	112		
<b>Male (=0)</b>	88		
<b>Income (Income)</b>			
<b>0</b>	40		
<b>&lt;£15000 but &gt;0</b>	27		
<b>£15,000-£35,000</b>	36		
<b>£35,000-55,000</b>	22		
<b>£55,000-£75,000</b>	14		
<b>£75,000-£95,000</b>	7		
<b>&gt;£95,000</b>	14		
<b>Doctor-patient concordance</b>			
<b>Age Match (=1 if doctor and patient belong to the same age bracket; =0 otherwise) (AgeMatch)</b>	200	0.333	0.473
<b>Gender Match (=1 if patient and doctor are of same gender; =0 otherwise) (GenderMatch)</b>	200	0.444	0.498

Table 2: Bivariate Correlations

	IntentionToUse	Awareness		IntentionToUse	Awareness
<b>IntentionToUse</b>	1		<b>DOC_Friend</b>	0.0127 (0.8599)	-0.0984 (0.1667)
<b>Awareness</b>	0.0846 (0.2359)	1	<b>DOC_Trust</b>	-0.0288 (0.6899)	-0.0388 (0.5863)
<b>HC_Waiting</b>	0.1617** (0.025)	0.016 (0.8236)	<b>Participation</b>	0.0412 (0.5678)	0.0189 (0.7911)
<b>HC_HospComp</b>	0.1474** (0.0465)	-0.0033 (0.9643)	<b>SAT_C_GP</b>	-0.0419 (0.591)	0.122 (0.1108)
<b>HC_Clinical_Performance</b>	0.2146*** (0.0034)	-0.0784 (0.2849)	<b>SAT_C_Hosp</b>	-0.003 (0.9715)	0.1024 (0.2111)
<b>HC_CloseHome</b>	-0.0623 (0.3848)	-0.0998 (0.1587)	<b>SAT_C_Doc</b>	-0.0348 (0.6909)	0.137 (0.1077)
<b>HC_Familiarity</b>	-0.0078 (0.9153)	-0.0752 (0.2986)	<b>SAT_C_Treatment</b>	-0.0157 (0.8526)	0.0932 (0.2598)
<b>HC_FinPerform</b>	0.1253** (0.0884)	0.1435** (0.0482)	<b>SAT_C_Time</b>	-0.0239 (0.7632)	0.0541 (0.4878)
<b>HC_GP_Reputation</b>	0.2020*** (0.0047)	-0.016 (0.8234)	<b>CB_AWARE</b>	-0.0381 (0.5972)	0.2997*** (0)
<b>HC_Access</b>	0.0451 (0.5399)	0.1196* (0.0992)	<b>CB_Use</b>	0.0996 (0.1651)	0.054 (0.4477)
<b>HC_PastExp</b>	0.0978 (0.182)	-0.0244 (0.7369)	<b>WEB_Access</b>	0.2054*** (0.0041)	0.1197* (0.0923)
<b>SI_GP_Advice</b>	0.1054 (0.1457)	0.0163 (0.8202)	<b>AgeMatch</b>	0.1373* (0.0532)	0.0695 (0.3234)
<b>SI_HospStat</b>	0.2937*** (0.0001)	0.1159 (0.1192)	<b>GenderMatch</b>	0.2077*** (0.0032)	0.1472** (0.0357)
<b>SI_DoctorRating</b>	0.3759*** (0)	0.1240* (0.099)	<b>WhiteBritish</b>	-0.0429 (0.5477)	-0.0662 (0.3468)
<b>SI_PastExp</b>	0.0563 (0.4455)	-0.0803 (0.2696)	<b>WhiteNonBritish</b>	-0.0017 (0.9809)	-0.0853 (0.2252)
<b>SI_Family</b>	0.1215* (0.0958)	-0.0511 (0.4804)	<b>Income</b>	0.012 (0.8818)	-0.1219 (0.1246)
<b>Reliable</b>	0.3429*** (0)	-0.0311 (0.7153)	<b>Education</b>	-0.0103 (0.8913)	0.0023 (0.9757)
<b>DOC_Listens</b>	0.0629 (0.3824)	-0.0888 (0.2122)	<b>Gender</b>	0.0315 (0.6614)	-0.0087 (0.9029)
<b>DOC_Time</b>	0.1565** (0.0289)	-0.0117 (0.87)	<b>Age</b>	-0.1081 (0.1344)	-0.1918*** (0.0068)
<b>DOC_Explains</b>	0.0968 (0.1784)	0.0152 (0.8314)			

P-Values in parentheses. \* p<.10, \*\* p<.05, \*\*\* p<.01

Table 3 Odds Ratios for the Binary Logit explaining the awareness of doctor rating websites.

	Model 1	Model 2	Model 3	Model 4
<b>Awareness</b>				
<b>Age</b>	0.953*	0.931**		
	(0.0239)	(0.0307)		
<b>Gender</b>	1.347	1.819		
	(0.648)	(1.092)		
<b>WhiteBritish</b>	0.595	0.841	0.401	0.0150**
	(0.309)	(0.524)	(0.276)	(0.0292)
<b>WhiteNonBritish</b>	0.273*	0.398	0.228*	0.00399**
	(0.198)	(0.324)	(0.200)	(0.00957)
<b>Education</b>	1.105	1.396	1.279	1.682
	(0.341)	(0.534)	(0.438)	(1.399)
<b>Income</b>	0.952	0.943	0.708*	0.228*
	(0.157)	(0.169)	(0.132)	(0.180)
<b>HC_HospComp</b>		1.173	1.353	2.237
		(0.366)	(0.442)	(1.825)
<b>HC_Clinical Performance</b>		0.691	0.527	0.0342*
		(0.245)	(0.207)	(0.0609)
<b>HC_Familiarity</b>		0.710	0.756	2.564
		(0.170)	(0.202)	(2.096)
<b>HC_GP_Reputation</b>		1.409	1.611	13.57*
		(0.509)	(0.599)	(19.95)
<b>HC_FinPerform</b>		0.921	0.963	0.0783**
		(0.264)	(0.297)	(0.0919)
<b>HC_Access</b>		1.112	1.088	0.917
		(0.236)	(0.242)	(0.444)
<b>SI_GP_Advice</b>		1.173	0.922	1.115
		(0.350)	(0.290)	(0.718)
<b>SI_HospStat</b>		1.291	1.390	49.75**
		(0.410)	(0.477)	(87.28)
<b>SI_Family</b>		0.935	0.614	0.146
		(0.361)	(0.273)	(0.186)
<b>SI_PastExp</b>		0.762	1.202	0.284
		(0.275)	(0.499)	(0.343)
<b>SI_DoctorRating</b>		0.938	0.933	1.859
		(0.261)	(0.271)	(1.119)
<b>DOC_Listens</b>			0.416	1.182
			(0.324)	(2.244)
<b>DOC_Time</b>			1.289	0.00185**
			(0.950)	(0.00580)
<b>DOC_Explains</b>			2.533	0.885
			(1.799)	(1.658)
<b>DOC_Friend</b>			0.752	15.62
			(0.535)	(30.63)
<b>DOC_Trust</b>			0.930	3.173
			(0.583)	(4.555)
<b>Participation</b>			1.080	3.346
			(0.298)	(2.835)
<b>AgeMatch</b>			2.247	269.4*
			(1.429)	(791.0)
<b>GenderMatch</b>			3.153*	32.77*
			(1.867)	(61.36)
<b>SAT_C_GP</b>				3.020
				(2.948)
<b>SAT_C_Hosp</b>				0.802
				(1.134)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

<b>SAT_C_Doc</b>	2.794
	(3.411)
<b>SAT_C_Treatment</b>	1.818
	(2.311)
<b>SAT_C_Time</b>	0.735
	(0.550)
<b>Same GP</b>	0.641
	(0.766)

Exponentiated coefficients; Standard errors in parentheses  
\* p<.10, \*\* p<.05, \*\*\* p<.01

For peer review only

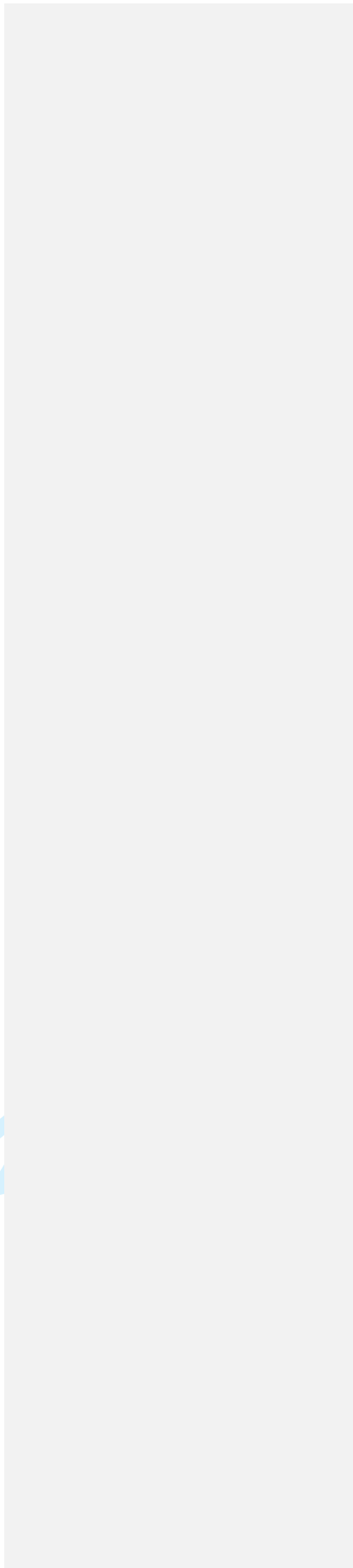


Table 4 Odds Ratios for the Ordered Logit explaining the likelihood to use different doctor rating websites

	m1	m2	m3	m4	m5	m6
AgeMatch	1.974 (2.377)	2.561 (2.953)	2.000 (1.965)	2.782 (2.613)	1.051 (0.818)	0.946 (0.729)
GenderMatch	18.42* (30.24)	12.03* (17.75)	10.45** (12.33)	10.39** (10.54)	16.67*** (15.48)	14.83*** (13.17)
Awareness	0.0531 (0.108)	0.0505 (0.0971)	0.0964 (0.149)	0.0758** (0.0985)	0.159* (0.176)	0.147* (0.152)
HC_Clinical_Performance	9.289* (11.84)	7.659* (8.241)	5.560** (4.759)	3.401* (2.253)	4.395** (2.653)	4.985*** (2.734)
HC_Familiarity	0.359 (0.287)	0.468 (0.282)	0.371* (0.220)	0.414* (0.206)	0.355** (0.147)	0.351*** (0.141)
HC_GP_Reputation	2.328 (1.980)	2.827 (2.106)	3.608* (2.542)	4.410** (2.753)	2.903** (1.374)	2.776** (1.260)
GP_Advice	0.170* (0.173)	0.223 (0.206)	0.238** (0.167)	0.283** (0.176)	0.344** (0.186)	0.396* (0.193)
HospStat	14.26** (18.84)	13.74** (15.60)	7.220*** (5.008)	6.550*** (4.200)	5.371*** (2.932)	5.133*** (2.703)
DoctorRating	1.596 (1.636)	1.067 (0.958)	1.424 (0.851)	1.461 (0.770)	2.245** (0.835)	2.312** (0.876)
Reliable	6.181 (7.691)	8.682* (9.969)	6.492** (4.993)	7.586*** (5.561)	4.457*** (2.351)	4.061*** (2.003)
DOC_Listens	141.9* (424.8)	51.44 (126.4)	44.20* (90.99)	27.05** (41.26)	22.03** (28.29)	22.98** (28.34)
DOC_Explains	0.00690* (0.0183)	0.00680** (0.0148)	0.00509** (0.0105)	0.00695*** (0.0124)	0.0120*** (0.0171)	0.0124*** (0.0169)
DOC_Friend	12.88 (29.23)	8.375 (14.65)	16.48** (22.41)	19.66*** (22.45)	8.718** (8.047)	7.781** (6.896)
Participation	5.473* (5.255)	5.818* (5.410)	5.171** (3.664)	4.162** (2.687)	2.349* (1.126)	2.228* (1.036)
SAT_C_GP	17.03* (27.58)	8.038 (10.23)	6.593* (6.659)	5.410** (4.048)	4.692** (2.889)	4.377*** (2.484)
SAT_C_Hosp	21.93** (33.71)	22.86** (30.90)	30.01*** (33.63)	34.38*** (35.43)	17.95*** (15.52)	11.11*** (7.578)
SAT_C_Treatment	0.0515** (0.0764)	0.0561** (0.0794)	0.111** (0.106)	0.147** (0.125)	0.145** (0.111)	0.111*** (0.0788)
WhiteBritish	0.0137* (0.0318)	0.0409* (0.0738)	0.0542** (0.0782)	0.0539** (0.0690)	0.0909** (0.0890)	0.105** (0.0973)
Income	0.416* (0.190)	0.382** (0.162)	0.449** (0.154)	0.513** (0.154)	0.476*** (0.129)	0.462*** (0.120)
SAT_C_Doc	0.242 (0.468)	0.243 (0.374)	0.148* (0.161)	0.135* (0.144)	0.427 (0.321)	
PastExp	0.670 (0.787)	0.590 (0.650)	0.535 (0.576)	0.551 (0.250)		
Education	0.486 (0.526)	0.583 (0.554)	0.683 (0.443)	0.610 (0.328)		
HC_Access	1.046 (0.659)	1.124 (0.678)	1.241 (0.564)	1.347 (0.565)		
HC_PastExp	1.030 (0.578)	0.914 (0.487)	0.930 (0.397)			
Family	1.208 (1.357)	1.305 (1.484)	1.439 (1.458)			
DOC_Time	1.223 (2.118)	2.099 (3.261)	2.594 (3.547)			

1  
2  
3  
4

5	DOC_Trust	0.153	0.608	0.460		
6		(0.327)	(0.983)	(0.629)		
7	WEB_Access	1.122	0.558	0.483		
8		(4.345)	(1.763)	(0.918)		
9	HC_Waiting	0.960	1.097			
10		(0.806)	(0.846)			
11	HC_HospComp	1.200	0.790			
12		(0.929)	(0.540)			
13	CloseHome	0.930	0.790			
14		(0.726)	(0.516)			
15	HC_FinPerform	0.610	0.692			
16		(0.621)	(0.588)			
17	SAT_C_Time	1.449	1.530			
18		(1.441)	(1.280)			
19	WhiteNonBritish	0.742	0.493			
20		(1.790)	(1.041)			
21	AWARE	1.422				
22		(3.158)				
23	Use	83.93				
24		(354.7)				
25	cut1	9454769.9**	2474784.8**	3131224.6**	2460471.3***	10470831.2***
26		(63313549.3)	(15197453.2)	(18256829.6)	(13260544.4)	(45550085.5)
27	cut2	7.05660e+09*	1.22556e+09***	1.14387e+09***	674102348.3***	1.42570e+09***
28		**				1.60379e+09***
29		(5.66892e+10)	(8.86204e+09)	(7.69789e+09)	(4.20283e+09)	(7.17551e+09)
30						(7.78799e+09)

26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

# QUESTIONNAIRE

---

Imperial College Business School



We would be very grateful for your cooperation in completing this questionnaire. It should take around **10 minutes** to complete.

The data collected will contribute towards a study into the healthcare service in the UK. There are currently major changes taking place in the NHS, in an effort to improve the choice and quality of services available to the public. One of these changes has been the introduction of a system called “Choose & Book” which gives you the option to choose which hospital you wish to go to for your outpatient appointment, following a GP referral. This is a study into how individuals regard these new choices and how they make decisions about where to receive care. In particular, we are studying the awareness and use of online doctor rating websites as a source of information for patients. These doctor rating websites allow patients to rate their doctors and provide feedback based on their own experiences. The ratings can then be used by others when deciding where to receive health care.

All data collected will remain strictly confidential. The study is being conducted by researchers from Imperial College London and King’s College London. If you would like to be informed of the results of this study, please contact [m.miraldo@imperial.ac.uk](mailto:m.miraldo@imperial.ac.uk).



## SECTION A

[www.iwantgreatcare.com](http://www.iwantgreatcare.com)

[www.NHSchoices.co.uk](http://www.NHSchoices.co.uk)

[www.patientopinion.co.uk](http://www.patientopinion.co.uk)

[www.privatehealth.co.uk](http://www.privatehealth.co.uk)

**Q1. Are you aware of any of the above online doctor rating websites or any other doctor rating websites?**

Yes  No  (if No, skip ahead to Section C)

Other (please specify).....

**Q2. How did you find out about these sites?**

Family/Friends

Doctor

The Media

Other (please specify).....

## SECTION B

**Q3. Have you used these websites in the past to look at doctor/hospital ratings?**

Yes  No  (if No, skip ahead to Section C)

**Q4. What specialty of doctor have you searched for in the past in these websites?**

.....

**Q5. When do you use these websites?**

On a regular basis  Only before/after an appointment  Rarely

**Q6. In the past, has the information on these websites influenced your choice of doctor/hospital?**

Yes  No

**Q7. If Yes, was this based on positive or negative information on the websites?**

Positive information  Negative information

**Q8. How easy to use do you find the sites?** Please circle the most appropriate number on a scale of 1 to 5 (1=very easy, 5=very difficult)

1      2      3      4      5

## SECTION C

**Q9. Which of the following factors are important to you in making decisions about where to receive healthcare?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important), or 'none of these'.

Waiting lists	1	2	3	4	5
Rates of hospital-acquired complications	1	2	3	4	5
Clinical performance rating	1	2	3	4	5
Closeness to home	1	2	3	4	5
Familiarity with the doctor	1	2	3	4	5
Financial performance of the hospital	1	2	3	4	5
Reputation of the doctor	1	2	3	4	5
Accessibility and parking facilities	1	2	3	4	5
Past experience with the provider	1	2	3	4	5
None of these					<input type="checkbox"/>

**Q10. Which of the following sources of information are important in making decisions about where to receive health care?** Please circle the most appropriate number on a scale of 1 to 5 (1=not important at all, 5=very important).

GP advice	1	2	3	4	5
Published hospital statistics	1	2	3	4	5
Online doctor rating website	1	2	3	4	5
Personal experiences in the past	1	2	3	4	5
Feedback from family/friends	1	2	3	4	5

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

**Q11. To what extent do you think that the online rating of doctors by patients is a reliable measure of a doctor's performance?** Please circle the most appropriate number on a scale of 1 to 5 (1=very unreliable, 5=very reliable)

1      2      3      4      5                      Not sure     

**Q12. If you have not used these websites before, how likely do you feel you will use them in the future?**

Not likely                       Quite likely                       Likely

---

## SECTION D

**Q13. These websites are based on patient input. Individuals can provide feedback based on their own experiences. Considering this, when would you be most likely to contribute to the online site?** Tick all that apply.

- Every time
- After particularly positive experiences only
- After particularly negative experiences only
- After both positive and negative experiences
- Never
- Not sure

**Q14. Out of the following what would be your motive for any contributions that you make to an online doctor rating site?** Tick all that apply.

- I would not contribute to these websites
- To inform other patients
- To improve standards of care in the NHS
- As a method of complaint
- In appreciation of a doctor's service
- Not sure

---

## SECTION E

**Q15. Which of the following attributes would you use to describe your GP?** Tick all that apply.

- I feel my doctor listens to my problems
- I feel my doctor spends enough time with me in each consultation
- I feel my doctor explains things clearly
- I feel my doctor is sociable and friendly

- I feel that I can trust my doctor's opinions
- None of the above

**Q16. How actively do you participate with your GP in making decisions about your health care generally?** Tick the single most appropriate.

- My doctor always makes decisions for me
- I like to know the options available but still let my doctor decide for me
- My doctor and I make the decisions together
- I make decisions for myself, after considering the advice of my GP
- I always make my own decisions, independently of the advice of my GP
- I make decisions with my parents/spouse/relatives

**Q17. Within your GP practice do you always want to see the same GP for an appointment?**

- I always request to see the same GP
- I don't mind which doctor I see.

**Q18. Where is choice more important to you in the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 =of no importance, 5 =very important) or select 'not sure'.

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of appointment time	1	2	3	4	5	Not sure	<input type="checkbox"/>

(for primary & secondary care)

**Q19. How satisfied are you with the current level of choice of where you can receive health care within the NHS?** Please circle the most appropriate number on a scale of 1 to 5 (1 = strongly dissatisfied, 5 = strongly satisfied) or select 'not sure'.

Choice of GP	1	2	3	4	5	Not sure	<input type="checkbox"/>
Choice of hospital for outpatient appointment	1	2	3	4	5	Not sure	

Choice of doctor for outpatient appointment	1	2	3	4	5	Not sure <input type="checkbox"/>
Choice of treatment	1	2	3	4	5	Not sure <input type="checkbox"/>
Choice of appointment time (for primary & secondary care)	1	2	3	4	5	Not sure <input type="checkbox"/>

**Q20. Choose and Book is a new NHS system which gives you the option to choose which hospital you wish to go to for your outpatient appointment. Are you aware of this system?**

Yes  No

**Q21. Have you used this Choose and Book system in the past?**

Yes  No

**Q22. If you have used the Choose & Book system in the past, how actively have you participated in making decisions about where to receive care? Tick the single most appropriate.**

- I have never used Choose & Book
- My doctor always makes decisions for me
- I like to know the options available but still let my doctor decide for me
- My doctor and I make the decisions together
- I make decisions for myself, after considering the advice of my GP
- I always make my own decisions, independently of the advice of my GP
- I make decisions with my parents/spouse/relative

**Q23. When is the choice of hospital important to you, for outpatient referrals? Tick all that apply.**

- Routine outpatient consultation
- Day-case procedure/surgery
- Major surgery
- None of these

## SECTION F

**Q24. Do you have access to a computer/laptop with internet access, at home or at work?**

Yes  No

**Q25. Have you used the internet in the past to search for health information?**

- Yes  No

**Q26. If you do not use online doctor rating websites, which of the following factors stops you from doing so? Tick all that apply**

- I'm too busy to have the time to use them
- The sites are not a reliable source of information
- It is difficult to interpret the information provided
- I already have enough information from other sources to make choices
- I don't have access to the internet
- I did not know these websites existed
- I have never needed to use these websites

**Q27. What other internet websites involving ratings do you use? Tick all that apply.**

- Shopping websites (e.g. Amazon)
- Holiday websites (e.g. TripAdvisor)
- Car insurance websites (e.g. Compare The Market)
- Restaurants/venue websites (e.g. ViewLondon)
- Film websites (e.g. Rottentomatoes)
- Other (please specify).....
- I don't use any rating websites.

**Q28. What methods of rating do you feel are a useful form of feedback in these websites? Tick all that apply.**

- Star-rating out of 5
- Percentage scores
- Thumbs Up/Down
- Written comments from patients/users
- No preference

## SECTION G

We remind you that all personal data collected will remain confidential and is collected for academic purposes.

**Q29. What is your age? .....**

**Q30. What is your gender?**

- Male  Female

**Q31. How would you describe your ethnicity?**

<input type="checkbox"/> White – British	<input type="checkbox"/> Other Asian – non-Chinese
<input type="checkbox"/> White – Others	<input type="checkbox"/> Black Caribbean

	Mixed race		Black African
	Indian		Black – Others
	Pakistani		Chinese
	Bangladeshi		Other

Q32. What is your postcode? .....

Q33. How many other individuals do you live with? .....

Q34. Do you live with your parents?

Yes  No

Q35. What is/was your profession? .....

Unemployed  Retired

Q36. What is your level of pre-tax income?

0  
 <£15000 but >0  £15,000-£35,000  
 £35,000-55,000  £55,000-£75,000  
 £75,000-£95,000  >£95,000

Q37. What is your highest level of educational attainment?

	GCSE		Other vocational degree
	A-Level		University degree
	BTEC		Postgraduate degree

Q38. In the last year how many times have you had an outpatient hospital appointment?

0 times  1-3 times  
 4-5 times  More than 5 times

Q39. What is the sex of your GP?

Male  Female

Q40. How old is your GP?

<30 years  
 30-50 years  
 >50 years

Q41. What is the ethnicity of your GP?

	White – British		Other Asian – non-Chinese
	White – Others		Black Caribbean

Mixed race	Black African
Indian	Black – Others
Pakistani	Chinese
Bangladeshi	Other

Q42. I cannot answer Q39, Q40, Q41 because I don't always see the same GP.

**This is the end of the questionnaire, thank you for your time.**

---