Non-adherence to medication and doctor-patient relationship; Evidence from a European survey.

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Abstract

Objective: Studies on the determinants of non-adherence to medication have put emphasis in understanding the role of the doctor-patient relationship in individuals' decision to follow recommendations. Yet, evidence on general perceptions that individuals hold about doctors and their impact on their decision to non-adhere is lacking. This paper aims to explore the issue using data from the European Social Survey (ESS). **Methods**: The ESS was conducted in 2004/2005 and included 45,700 participants from 24 countries in Europe. A Heckman probit model with sample selection was used for the analysis. **Results**: The results show that perceptions about doctors constitute the model that better explains non-adherence to prescribed medication.

Conclusion and Practice Implications: Our findings confirm that general beliefs individuals have about the doctor-patient relationship impact significantly on their decision to non-adhere to prescribed medication. Key points were shown to be involvement in the decision making process, treating patients as equals and avoiding leaving unresolved issues when prescribing.

Keywords: doctor-patient relationship, general perceptions, non-adherence, European Social Survey, institutional factors.

Classification codes: I10, C01

1. Introduction

Non-adherence to medication has been described as a 'worldwide problem of striking magnitude' [1]. It has been shown to lead to reduced health outcomes and increased health care costs due to relapses and complications [2]. The importance of the issue has resulted in a number of studies that investigate the determinants of patients' decision not to follow recommendations.

During the last few years, there has been an increasing interest to understand how the doctor-patient relationship may affect patients' decision to adhere to medical recommendations [3]. Evidence at the patient level identifies a number of problems in the area. Expectations for communication and participation during the encounter [4], misunderstandings between the two parties [3,5] and different agendas that are not met during the consultation [6] are a few examples of the challenging aspects of the doctor-patient relationship that may lead to non-adherence to medication.

Yet, the majority of the evidence is at a patient level and it focuses on specific disease groups or consultation settings. It is therefore difficult to examine the general perceptions that individuals hold about their doctors and their attitudes in following recommendations. In addition, large scale data from the population is restricted and the area remains largely unexplored.

The aim of this paper is to investigate individuals' general perceptions of the doctor-patient relationship and to understand how they affect their decision to non-adhere to prescribed medication. Our objectives are, first to identify which aspects of the doctor-patient relationship as perceived by the individuals are important in non-adherence and second, to explore other factors, mainly institutional, that may affect non-adherence to medication.

We use data from the European Social Survey, one of the few attempts to systematically collect data on individuals' attitudes towards medication and their perceptions of the doctor-patient

3

relationship from a large number of countries. This approach will give useful insights into the heterogeneity of different health systems and the impact on individuals' decisions to non-adhere. Overall, analysing non-adherence and individuals' general perceptions of the doctor-patient relationship outside the usual condition-specific approach, will allow policy makers to identify the general aspects that matter to tackle the issue.

2. Methods

2.1 Data – European Social Survey

The European Social Survey [7] (henceforth ESS) is an academically driven multi-country survey. The survey, currently in its fourth round, runs every two years, satisfying high standard technical requirements and involving rigorous translation protocols. An hour-long face-to-face interview includes, amongst others, questions on family, work and well-being, health and economic welfare. Information was recorded at an individual level and eligible participants were all persons aged 15 and over who were residents within private households regardless of their nationality, citizenship, language or legal status.

In the present study, data from the second round of the ESS edition 2.0 are used, that includes questions in health and care seeking. In particular, the second round has questions on doctor-patient relationship as well as a question on peoples' attitudes towards medication. The study ran between 2004 and 2005 and 45,700 individuals participated from 24 European countries. The average response rate was 62%.

2.2 Description of variables

Non-adherence to medication

Non-adherence to medication was the main dependent variable. It is self-reported and was measured by asking the interviewee to "think back to the last time a doctor prescribed you a

4

medicine you had not had before. Which statement comes closest to what you did with the prescription?" Seven options were given for a response:

a. I didn't collect the medicine from the pharmacy.

b. I collected the medicine but didn't use any of it.

c. I used some or all of the medicine but not exactly as prescribed.

d. I used the medicine exactly as prescribed.

e. Can't remember last occasion.

f. Never had prescription from doctor.

g. Other answer.

For the present study this variable was converted into a new one based on the assumption that any deviation from the doctor's suggestion is considered non-adherence to medication [8]. Respondents are classified as 'non adherents' if they did not collect the medicine from the pharmacy, collected it but didn't use it, or used it but not exactly as prescribed. 'Adherents' are those responding that they used the medicine exactly as prescribed. Finally, the rest of the responses were set as missing.

Perceptions of the doctor-patient relationship

Individuals' perceptions of the doctor-patient relationship were assessed through a number of questions in the ESS and they constituted the main explanatory variables for the present analysis. Respondents were asked to show their agreement or not with the following statements:

❑ "People can cure themselves without having to visit a doctor".

❑ "People rely too much on their doctors rather than themselves to keep healthy".

❑ "When people are sure about what medicine they need, their doctor should just prescribe it for them".

❑ "I generally feel a bit disappointed when I leave a doctor's surgery without a prescription".

All answers were turned into binary ones: 1=agree (including those who agree or agree strongly) and 0=not agree (including those who disagree, disagree strongly and neither agree nor disagree).

Another cluster of questions asked respondents to indicate how often they thought the following applies to doctors in general.

- ❑ "Doctors keep the whole truth from their patients".
- ❑ "GP's treat their patients as their equals".
- ❑ "Before doctors decide on a treatment, they discuss it with their patient".
- ❑ "Patients are reluctant to ask their doctors all they'd like to ask".
- ❑ "Doctors are willing to admit their mistakes to their patients".
- ❑ "Doctors use words or phrases that their patients find difficult to understand".

Answers were merged into two categories: 1=yes, the statement applies to doctors and 0=no it does not.

Control variables

In addition to the impact of general perceptions of the doctor-patient relationship on non-adherence it is considered essential for the analysis to control for other factors that the literature has shown that they affect non-adherence to medication. These included socio-demographic factors (age, gender, marital status, living in a rural area and education), self-reported income and two variables on health and disability. ESS also includes questions on health system related factors and for the purpose of the present study two aspects regarding health systems were examined, i.e. feeling that people have enough choice in selecting their physician and their preferences about consulting specialised doctors. Finally, a question on fear of side effects was also included in the analysis.

2.3 Preliminary analysis

The fact that the main explanatory variables looking at the individuals' perceptions on doctors may be highly correlated with each other generated concerns about collinearity. To check for possible correlation between the variables, a covariance matrix among the main explanatory variables was computed. The absolute value of the correlations ranged from to 0.0002 to 0.39 and therefore associations between the variables were very low.

To test further for collinearity between the main explanatory variables, the variance inflation factor (VIF) test was used. In general collinearity is a problem among the independent (right-hand side) variables and therefore the VIF test from an OLS regression model is valid for a probit model with those variables. A regression model with the explanatory variables was run and the VIF was estimated to be 1.07.[1] The low value of the VIF test suggests that collinearity is not a concerning limitation in the interpretation of the empirical estimates.

2.4 Model specifications

The main concern of this paper is to explain non-adherence to prescribed medication by the variables presented in the previous section (Section 2.2). Hence, non-adherence to medication is specified as a function of the previously defined variables and in its general form could be expressed in the following way:

$$y_i = x_i'\beta + \varepsilon_i \qquad (1)$$

where y_i is the dependent variable for observation i, i.e. self-reported non-adherence to medication, β is a ($k \times 1$) vector of the unknown parameters, x_i is the ($k \times 1$) vector of the explanatory variables, and ε_i is the error term with $\varepsilon_i \sim N(0, \sigma)$.

Before finally deciding on the appropriate model for the analysis, an important feature of the data merits attention. The dependent variable, which defines the nature of the model, is binary with 0

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[1] Values of VIF higher than 10 indicate serious problem of collinearity [9].

standing for 'adherent' and 1 for 'non-adherent' respondent. However, a third category, of those respondents who did not answer the question, could not remember, reported they had never had a prescription before or refused to answer was set as missing. Analysis with a probit model would be adequate if missing values were missing completely at random.

The question on non-adherence was self-reported and it can be perceived by some respondents as a question judging people's behaviour [10]. It is likely that some of the respondents refused to answer because they felt they were being judged for their behaviour. In addition, some of the respondents who did not recall the last time they were prescribed medication may have memory loss problems, an issue associated with non-adherence as well. All these elements raised considerations of sample selection and lead to a model specification that takes into account the information that may be hidden in missing values.

To correct for the potential bias due to the missing values of the dependent variable, a Heckman probit model with sample selection is used.[2] The model, proposed by Van de Ven and Van Praag [14] is based on the Heckman selection model [15], where the dependent variable is binary. The model accounts for the differential likelihood that the respondents have answered the question (i.e. they are non-missing). The model consists of two relations. First there is the regression model:

$$y_i = x_i'\beta + \varepsilon_{1i} \tag{2}$$

and second there is the selection model:

$$z_i'\gamma + \varepsilon_{2i} > 0. \tag{3}$$

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[2] An alternative to the Heckman sample selection model is the two-part model [11]. There has been extensive debate in the literature regarding the choice between the two-part model and the sample selection model [12]. Leung and Yu [13] used Monte Carlo simulations to compare these two differing methods and determined that the final choice depends on the empirical context. In general, the two-part model is more appropriate for sequential decisions or in cases where there is collinearity. None of these characteristics is present in our analysis therefore the Heckman sample selection is chosen for the analysis of our data.

In the case of our model, observations for which y is missing are assumed not selected and those for which y is not missing are assumed selected. In the latter case the selection relation generates a value of 1. For the two relations above the following holds:

$$\varepsilon_{1i} \sim N(0,\sigma),$$

$$\varepsilon_{2i} \sim N(0,1),$$

$$\text{Corr}(\varepsilon_{1i},\varepsilon_{2i}) = \rho.$$

The model tests the correlation between the two relations that are used to predict the probability of two events; non-adherence and report of adherence (non-missing). When $\rho = 0$ the probit regression provides unbiased estimates, while when $\rho \neq 0$ the probit estimates are biased. In the presence of correlation the missing values affect the validity of being non-adherent. In this case, the model corrects for systematic differences between the two groups (missing and non-missing) so that the predicted probabilities for respondents do not have a selection bias. In other words, the probit selection model allows the use of information for the missing values, to improve the estimates of the parameters in the regression model. It provides consistent, asymptotically efficient estimates for all parameters in the model.

In our study, the regression model (equation 1) predicts non-adherence to medication and the selected model (relation 2) predicts whether people were selected, i.e. were not set as missing. The selection function contains a set of explanatory factors z_i which are a superset of x_i. It has been argued that when the same explanatory variables are used to predict both the regression and the selection function, the parameters are theoretically identified but this identification is too weak to be applied in practice [16]. Hence, in our model z_i includes all x_i as well as another variable that indicates the time that was needed to complete the questionnaire. It is checked that the time needed to complete the interview is associated with whether the respondent answered the question but not with whether they decided to adhere or not.

Three main models are analysed. In Model I only socioeconomic variables are included as explanatory factors of non-adherence. Gradually, all control variables are included in Model II and finally Model III includes all explanatory variables, and both control factors and beliefs about the doctor patient relationship. The aim is to compare the three models in order to identify the model that is a better predictor of the dependent variable, i.e. non-adherence to medication. Data is clustered by country and a dummy variable of the countries is also introduced to control for differences among them.

For the analysis of the above data the statistical package STATA ed.9 was used.

2.4 Weighting survey data

The European Social Survey is a population study and therefore needs to be weighted to correct for specific characteristics that may bias the analysis. Two basic weights were used in the analysis. The population weight corrects for differences in the population size among the participating countries. The design weight corrects for differences in the probability selection and was computed as the inverse of the inclusion probabilities.

3. Results

3.1 Descriptive statistics

Figure 1 shows the mean non-adherence rates among the ESS countries, in an attempt to map self-reported non-adherence in Europe. It becomes obvious from the figure, that there is no clear pattern that explains adherence. On the top of the list of non-adherents there are both countries of central and northern Europe (Luxemburg and Norway) as well as countries in transition such as Ukraine and Hungary. At the bottom of the list, there are two Mediterranean countries, Greece

and Portugal, where satisfaction with health care system has been shown to be particularly low [17].

<Please insert Figure 1 here>

Table 1 describes the independent variables used in the analysis. These were demographic and socioeconomic factors, health related factors, institutional factors and beliefs about the doctor-patient relationship.

<Please insert Table 1 here>

3.2 Determinants of non-adherence

This stage of the analysis looks for the association between non-adherence and the explanatory variables by using the Heckman probit model with sample selection. For purposes of clarity, results from the selection model are omitted and only the rho (ρ) and its p-value will be reported here.

The three main models are compared here and presented in Table 2. The tables present the marginal effects (indicated in the text by mfx) which are more meaningful than the beta coefficients and easier to interpret. In general, Model III, which includes all the control and explanatory variables, is the best predictor of non-adherence (log-likelihood was -13186.09 as compared to -20536.34 and -16788.87 for Models I and II). In other words, perceptions about doctors along with the control variables constitute the model that better explains non-adherence to prescribed medication.

11

In addition, the model indicates that there is indeed sample selection in Model (Model III: $\rho = 0.312$, p<0.01) but not in Model I or Model II. Results confirm that the Heckman probit model with sample selection was the most appropriate model for the analysis.

<Please insert Table 2 here>

Perceptions regarding the doctor-patient relationship are strong predictors of non-adherence to medication in the European sample. Those more likely to non-adhere are respondents who believe that people rely too much on doctors (mfx=0.0222, p<0.001) and that when people are sure of medicine the doctor should prescribe it (mfx=0.0331, p<0.001). Similarly, those who are disappointed when they leave without a prescription (mfx=0.0436, p<0.001) and those who feel people are reluctant to ask questions (mfx=0.0144, p<0.05) are more likely to non-adhere to prescriptions, and so do people who those who feel that doctors do not tell the whole truth (mfx=0.0259, p<0.05).

On the other hand, those who believe that doctors treat patients as equals (mfx=-0.0412, p<0.001) are less likely to non-adhere. Similarly, people who think that doctors discuss the treatment with the patient before they decide are 3% less likely to non-adhere to the recommendation than those who believe the opposite (p<0.01).

Another remarkable finding arising from the analysis is the effect that institutional factors have on respondents' decision to non-adhere. More specifically, the ability to choose a doctor has a significant effect on people's decision to follow recommendations. Those Europeans who felt they have enough choice are less likely to non-adhere (mfx=-0.0373, p<0.001 for Model II and mfx=-0.0322, p<0.001 for Model III).

12

On the socio-economic factors, female Europeans are more likely to non-adhere than men and this is constant in all three models. Age is not significant, yet age squared is negatively associated with non-adherence in all three models indicating that after a certain age people are less likely to non-adhere. Other socio-demographic factors predicting non-adherence was marital status, with married respondents being about 2% less likely to non-adhere in all three models. Also, living in an urban area and reporting lower income were also associated with higher non-adherence.

Also, those Europeans reporting worse state of health are less likely to non-adherence. In the view of the above results a number of interaction effects of health status with health beliefs were tested to reveal any hidden determinant of adherence. Only the interaction between the belief that people can cure themselves and health was significant (b=0.1312, p=0.004). This indicates that people in worse health who believe that they can cure themselves are more likely to non-adhere. This result confirms our initial hypothesis that health may affect not only non-adherence directly but also beliefs people hold about doctors.

4. Discussion and Conclusions

4.1 Discussion

The ESS provided a solid foundation for a statistical analysis of the issues which concern this paper. It is a unique opportunity of a large scale dataset that allows for general perceptions of the doctor-patient relationship and adherence to medication to be examined using a sample from 24 European countries. However, the survey is not without limitations and these are taken into consideration before discussing the results. The main variable of interest measuring non-adherence was generally referring to any prescribed medication and information on the type of medication and the duration of treatment would have been useful. Similarly, apart from the self-reported health status, there was no information on any medical conditions the individual may suffer from.

Yet, the analysis provides one of the very few attempts to examine non-adherence to prescribed medication using a sample from a large number of European countries. The present study intended to disentangle the impact of general perceptions individuals hold about the doctor-patient relationship and indeed identified a number of aspects of this relationship that affect their decision to follow recommendations which are discussed below.

Unresolved issues during the actual consultation were shown to be barriers in the doctor-patient relationship. More specifically, reluctance to ask the doctor questions was a significant factor leading to non-adherence, indicating that when people do not clarify questions they have, they may leave the consultation with confusion regarding their medication. Misunderstanding of medication was associated with decreased adherence in a study by Farber et al. [5]. Similarly, feeling that the doctors do not tell patients the whole truth also led people not to take the medication as prescribed. This finding indicates that the nature of the perceived asymmetry of information appears to be an important factor affecting patients' adherence. This may also be related to unvoiced patient's agenda items that lead to reduced adherence rates as shown by a study by Barry et al.[6] among doctors and patients in England.

On the other hand, the beliefs that doctors treat patients as equals and that they discuss before they decide on the treatment were negatively related to non-adherence. This is an important finding showing that involvement in the decision making process affects non-adherence to medication. This has been shown in previous empirical evidence from consultations in GP practices in the UK [4].

The way people perceive the doctor's role in prescribing was a significant predictor of non-adherence as shown from the analysis. Non-adherence increased with the belief that when people are sure of the medicine they want the doctor should prescribe it, as well as with the disappointment of leaving the doctor's clinic without a prescription. On a first level, this may seem an oxymoron. Yet, it underlines possible unmet expectations from the patient's side; when

he feels that the doctor does not give him what he believes he needs he is more likely not to follow her recommendations when made. Hence, that requires that when the doctor ends the consultation she needs to make explicit not only the reasons why she prescribes a medication but also the reasons why she may not.

From the control variables, the most interesting result is the impact of institutional factors, i.e. the ability to choose a doctor. This is particularly valuable in view of the limited evidence in the area. A possible interpretation lies in what the theoretical models of health behaviour, including the Theory of Reasoned Action [18] and Planned Behaviour [19], define as 'perceived control'. Being able to choose the doctor may be perceived by the individuals as a way of having control over their own care. Another explanation may be the fact that more choice improves satisfaction with the consultation and consequently may lead to better adherence to recommendations. Indeed, some evidence supports this explanation as it shows that the patient's opportunity to select their personal physician may influence subsequent satisfaction with recommendations [20].

The results on the impact of most socio-demographic variables confirmed previous evidence. Age squared was negatively associated with non-adherence indicating that after a certain age people are less likely to non-adhere. These results are not inconsistent with previous evidence where older people have been shown to adhere more to recommendations [21, 22]. Being married was associated with better adherence indicating that support by the partner may help the individual remember to take the medication. Indeed, Morse et al. [23] in a study among HIV patients in the USA showed that living with someone else was associated with improved adherence rates. Also, the analysis showed that lower income is associated with primary non-adherence, i.e. patients not having their prescription filled in the pharmacy [24]. However, lack of information on prescription costs in the ESS does not permit such an analysis here. In addition, individuals in worse state of health were less likely to non-adhere which was not surprising as severity of a condition has been reported to be related to better adherence in condition specific studies [25].

The only contradiction to our initial hypothesis was the impact of domicile. Those living in urban areas were shown to be less adherent than those in rural areas. Our hypothesis that better access to health care for those living in a city would imply better adherence was not confirmed. Finally, despite extensive evidence from the literature associating fear of side-effects with patients' decision not to take their medication [26, 27, 28] the analysis of the present study showed that this fear was not a significant factor in non-adherence, in any of the three models.

4.2 Conclusions

In this paper we have drawn upon an empirical examination of a widely representative database, the ESS, to explore the underlying determinants of individuals' adherence to medications, especially to disentangle the role of general perceptions patients' hold about the doctor- patient relationship. Despite its limitations, the ESS is one of the very few attempts systematically to collect data on medicine taking and the perceptions of the doctor-patient relationship from a large number of countries in Europe. Hence, it provides a unique opportunity to study the issue of non-adherence outside the usual clinical setting that most of the literature in the area examines.

Evidence in the area of doctor-patient relationship and non-adherence to medication has extensively argued for the importance of this interaction in understanding the problem. The present study takes the argument one step further claiming, on the basis of the results obtained, that even general perceptions that individuals hold about doctors, not necessarily their own physicians, impact on their decision to follow a medical recommendation when they are given one. Exploring the general aspects of this relationship that impact on adherence is crucial in understanding the general picture of the problem.

4.3 Practice implications

The findings support the opinion that, irrespective of the disease characteristics or the specific circumstances of a consultation, individuals' perceptions of the doctor-patient relationship is a key issue in the problem of non-adherence. They support further and even more strongly the need for better doctor-patient relationships as the basis of any intervention that intends to help patients follow recommendations. Key points that contribute to a good atmosphere and improve adherence were shown to be involvement in the decision making process, treating patients as equals and avoiding leaving unresolved issues when prescribing. In addition the study confirmed that institutional factors including more choice regarding doctors, were also shown to affect adherence to medication and need to be taken into consideration when appropriate policies are built.

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Table 1: Description of variables

	ESS-24	
	Mean	**St. Err.**
Demographic and socioeconomic factors		
age (years)	48.0677	0.1040
sex (0=male 1=female)	0.4555	0.0029
married (0=not married 1=married)	0.5486	0.0028
education (0=primary education)	0.1841	0.0022
Secondary	0.6187	0.0028
Tertiary	0.1970	0.0023
Urban	0.3145	0.0027
feeling about household's income (0=living comfortable)	0.2992	0.0026
coping at present income	0.4514	0.0028
difficult on present income	0.1862	0.0022
very difficult on present income	0.0630	0.0014
Health status		
health status (0=good)	0.6509	0.0027
Fair	0.2662	0.0025
Bad	0.0828	0.0016
disability (0=no, 1=yes)	0.2506	0.0025
Health system related factors		
choice regarding GP (0=not enough, 1=enough choice)	0.7184	0.0026
prefer same doctor (0=not same, 1=same)	0.7225	0.0026
Worried about side effects (0=no, 1=yes)	0.3412	0.0027
Doctor-patient relationship		
believe people can cure themselves [+]	0.8472	0.0020
believe people rely too much on doctors [+]	0.6564	0.0027
believe when people sure of medicine doctor should prescribe [+]	0.2805	0.0026
feel disappointed when leave without prescription [+]	0.0952	0.0017
believe doctors keep the whole truth [+]	0.1518	0.0020
believe doctors treat patients as equals [++]	0.4955	0.0029
believe doctors discuss treatment before they decide [++]	0.5475	0.0028
believe patients are reluctant to ask questions [++]	0.2519	0.0025
believe doctors admit their mistakes [++]	0.1116	0.0018
believe doctors use words patients find difficult to understand [++]	0.2872	0.0026
[+] 0=not agree, 1=agree [++] 0=no & to some extent, 1=yes		

Table 2: Factors associated with non-adherence

	Model I	Model II	Model III
	Marginal Effects	Marginal Effects	Marginal Effects
Socio-demographic factors			
age squared (years)	-0.000033***	-0.000026**	-0.00002*
age (years)	0.001961	0.00098	0.0005
sex (0=male 1=female)	0.017675*	0.0194*	0.0205*
married (0=not married 1=married)	-0.02486***	-0.0252***	-0.0234**
education (0=primary education)			
secondary	0.013082	0.0100	0.0131
tertiary	0.012861	0.0055	0.0217
Urban	0.012113*	0.0153*	0.0121
feeling about household's income (0=living comfortable)			
coping at present income	-0.00976	-0.0074	-0.0106
difficult on present income	0.010772	0.0226*	0.0103*
very difficult on present income	0.015532	0.0217*	0.0011
Health status			
health status (0=good)			
fair		-0.0060	-0.0007
bad		-0.0252***	-0.0220*
disability (0=no, 1=yes)		0.0198	0.0210
Institutional factors			
choice regarding GP (0=not enough, 1=enough choice)		-0.0373***	-0.0322***
prefer same doctor (0=no, 1=yes)		-0.0373	-0.0312
Worried about side effects (0=no & to some extent, 1=yes)		0.0142	0.0091
Doctor-patient relationship (I believe...)			
..people can cure themselves (0=not agree, 1=agree)			0.0048
..people rely too much on doctors (0= not agree, 1=agree)			0.0222***
..if people sure of medicine doctor should prescribe(0=not agree, 1=agree)			0.0331***
..feel disappointed when leave without prescription (0=not agree, 1=agree)			0.0436***
..doctors keep the whole truth (0=no, 1=yes)			0.0259*
..doctors treat patients as equals (0=no, 1=yes)			-0.0412***
..doctors discuss treatment (0=no, 1=yes)			-0.0301**
..patients are reluctant to ask questions (0=no, 1=yes)			0.0144*
..doctors admit their mistakes (0=no, 1=yes)			0.0004
..doctors use difficult words (0=no, 1=yes)			0.0049
Log pseudolikelihood	-20536.34	-16788.87	-13186.09
Athrho	0.6446848	0.2468262	0.3122342**

*p<0.05; **p<0.01; ***p<0.001

Fig Luxembourg **untries**

Country	Percent
Luxembourg	25.2%
Ukraine	24.7%
Norway	23.8%
Hungary	20.3%
Belgium	19.8%
Poland	19.4%
Sweden	19.3%
Austria	18.6%
Slovenia	18.2%
Iceland	18.1%
Estonia	17.6%
France	17.5%
Spain	16.9%
Finland	16.3%
Czech	16.2%
United Kingdom	16.1%
Slovakia	16.0%
Germany	15.8%
Switzerland	15.3%
Denmark	12.4%
Ireland	12.0%
Netherlands	10.4%
Greece	6.7%
Portugal	6.3%

0.0%   5.0%   10.0%   15.0%   20.0%   25.0%   30.0%