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APPLYING LOGISTIC REGRESSION ANALYSIS TO IDENTIFY PATIENT'S SATISFACTION PREDICTORS WITH GENERAL PRACTITIONER ASSISTANCE: EVIDENCE FROM FOUR ITALIAN REGIONS

APPLYING LOGISTIC REGRESSION TO A SURVEY ABOUT
GENERAL PRACTICE IN FOUR ITALIAN REGIONS:
DETERMINANTS OF PATIENTS' SATISFACTION

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**APPLYING LOGISTIC REGRESSION ANALYSIS TO IDENTIFY PATIENT'S
SATISFACTION PREDICTORS WITH GENERAL PRACTITIONER ASSISTANCE:
EVIDENCE FROM FOUR ITALIAN REGIONS**

Cinzia Panero, Anna Maria Murante, Giovanni Perucca

Abstract

In the last years the interest for patient experience with health care services largely increased. Several surveys have been conducted in order to observe if health care systems answer to the overall patient needs. In 2000 World Health Organization challenged modern health care providers to ensure responsiveness to patients, i.e. to deliver also non-health assistance (respect for dignity, confidentiality, prompt attention, quality of amenities, access to social support networks, choice of provider, etc.).

Poor evidence is available in Italy about connections between perceived quality and the capability of the healthcare system to respond to patients' needs. This work aims at investigating patient experience with General Practitioner (GP) assistance and at measuring the impact of personal and organizational characteristics on overall satisfaction and on willingness to recommend.

In 2009 a sample survey was conducted in four regions of Italy (Tuscany, Piedmont, Umbria, and Liguria). About 15.000 citizens answered to a large questionnaire related to Primary Care services, including a section dedicated to General Practitioner (GP) assistance. A logistic regression analysis was applied to analyze which are the predictors of overall satisfaction with GP, focusing mainly on variables related to patient's expectations, continuity of care and organizational aspects (e.g. scheduled access, waiting time, health case history, etc.) and if there are differences across the four Italian Regions. Econometric analysis has been carried out through both ordered logistic regression and generalised ordered logit models.

The inhabitants of the four Italian Regions refer a nice experience with GP assistance: more than 85% of them judged excellent or good the overall service. Generally, in some regions patient expectations affect more the willingness to recommend GP to friends or family members than the overall judgement on service. Besides, the findings provide convincing evidence that GP is a nodal point in the continuity of care process.

Classification JEL: M31, I19

Keywords: patient satisfaction, general practitioner, organizational aspects, continuity of care.

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1. Introduction¹

In 2000 World Health Organization stated that the goals of health systems are not only better health and financing fairness, but also responsiveness to people's expectations in regard to non-health matters, that is the importance of respecting people's dignity, autonomy and the confidentiality of information (World Health Report, 2000).

Responsiveness to people's expectations is a complex goal to achieve. Moreover the patient is in a weak position due to the presence of asymmetric information (Arrow, 1963) in the relationship with the health service providers. This asymmetry is particularly relevant in underprivileged classes, making more difficult the access to health services. In fact, people who are unconcerned with a particular aspect of their health are not likely to perceive any information that bears on that aspect of their health or they fail to learn, accept or use it (Rosenstock, 1966).

Therefore, in recent years, many health systems have focussed their attention to patient needs, satisfaction and its determinants in order to meet these challenges, become more effective and to provide patient-centred clinical pathways.

To assess the effectiveness of these organizational changes, many health systems have adopted multidimensional systems of performance evaluation concerning also patient satisfaction (Nuti, 2008). In fact, to make health services more patient-centered, it is very important to consider the patient's perception of health services quality. But it is also important to analyze the patient characteristics, lifestyle and expectations in order to customize the services' offer and, if it is possible, to proactively anticipate patient's needs (Miolo Vitali and Nuti, 2004).

¹ Even if the paper is the result of the authors' co-operation, the paragraphs 1 and 4 are attributable to Cinzia Panero, paragraph 2 and 3.3 to Giovanni Perucca, paragraphs 3.1, 3.2, 3.4 to Anna Maria Murante, and paragraph 5 and 6 to all three authors.

This paper therefore aims at analysing patient experience with a specific health service, that is General Practitioner (GP) assistance, and to measure the impact of patient and organization characteristics on overall satisfaction and on willingness to recommend one own GP to other people. To achieve this result, the paper adopts logistic regression model. Since patients' satisfaction is ranked in more than two categories, the econometric analysis is carried out through ordered logit models.

2. Background.

In the last decades an increasing amount of survey data about patients' satisfaction has been collected. In literature patient satisfaction with most of the services and facilities provided by health care systems is investigated. A particular attention has been devoted also to primary care and to GP services starting from the early contributions carried out in the UK (Cartwright, 1964; Kaim-Caudle and Marsh, 1977).

The patient experience is relevant for at least two reasons. The first one concerns its implications in health policies and programs. In 2000 World Health Organization (WHO) challenged modern health care providers to ensure responsiveness to patients' needs. Responsiveness is not strictly defined in terms of health assistance but embrace a large number of related and prominent issues such as the respect for dignity, confidentiality, prompt attention, quality of amenities, access to social support networks, choice of provider, etc. Second, valuable contributions to the improvement of health care can be provided by patients themselves. They can be definers of good quality, evaluators of health care delivery and reporters of their experiences (Donabedian, 1999). As participants in health care delivery, they can influence the quality of care in more direct ways as well, for example by means of involvement in decisions concerning medical treatment. Moreover, investigating patients' satisfaction with health services is clinically relevant, since satisfied patients are more likely to comply with

treatment (Guldvog, 1999), to take an active role in their own care (Donabedian, 1988) and less likely to change their own medical care provider (Marquis et al., 1983).

As a consequence of these considerations, the analysis of patients' satisfaction becomes crucial in order to allow the system to meet health care needs. Then, it is essential to properly define and investigate all the elements which drive patients' preferences.

Following the classification suggested by Sitzia and Wood (1997), these elements can be classified as determinants of satisfaction when they concern patient-specific characteristic, or as components of satisfaction when they refer to some aspects of the health care service.

In the last years researchers unanimously recognised the prominence of expectations as a determinant of satisfaction: Williams (1994) defines satisfaction itself as "an evaluation based on the fulfilment of expectations". A large literature has focused on this topic, in the attempt to define the concept of expectation and to clarify its connections with satisfaction. The first topic has been investigated by Stimson and Webb (1975), who identified three categories of expectations. The first one, "background expectations", refers to the largely implicit expectations about what usually happens when you see a doctor. The second category, "interaction expectations", is related with the interpersonal communication between the provider of health care assistance and the patient. Finally, "action expectations" concern the action that will be taken by the provider. As pointed out by Sitzia and Wood, such classification associates satisfaction with the fulfilment of positive expectations, as in the definition suggested by Williams. However, some authors (Bond and Thomas, 1992) argued that expectations are not stable, but they are expected to change in respect to patients' knowledge and experience. Then, the difficulty in analysing the role of expectations on satisfaction resides in the feasibility to find

analytical measures for them, which have to be able to capture individual-specific, non observable characteristics.

In order to avoid this problem, many works focused on the relationship existing between observable features and satisfaction. A large literature is devoted to the role of patients' socio-demographic characteristics as predictors of satisfaction. The most consistent finding is the one related to age: older patients tend to be more satisfied with their health care. Robust evidence is available for education as well (Hall and Dornan, 1990), but this time the results suggest a negative relationship with satisfaction. Studies on the effect of gender are contradictory and the same holds for marital status and social class (Ware et al., 1977). Many works focused on the link between ethnicity and satisfaction, and most of them argued that being a member of a minority group is associated with lower rates of satisfaction (Dial et al., 2005).

Another relevant item in explaining satisfaction concerns the major characteristics of providers and medical care services, what Sitzia and Wood defined as components of satisfaction. Ware et al. identified eight dimensions, each of them related to one peculiar source of satisfaction with care. The art of care involves the interpersonal experience between the patient and the provider of health care (respect, patience, friendliness, etc.). Some authors (Baker and Streatfield, 1995) included in this dimension some demographic characteristics of GP, such as age, gender and experience. The technical quality of care concerns technical aspects such as providers' medical competence and adherence to high standards of diagnosis and treatments. The accessibility/convenience dimension refers to all those factors which matter when arranging to receive medical care: waiting time, ease of access, etc. Financial aspects, such as cost of treatments, flexibility of payment mechanisms, constitute the dimension of finances. The physical environment involves all relevant characteristics of the environment (hospital, ambulatory) where the health service is

delivered; examples are given by the comfort of seating, cleanliness, attractiveness of waiting rooms, etc. The dimension of availability focuses on the supply of medical services, i.e. the number of physicians, nurses and other providers. The continuity of care is defined in terms of “regularity of care from the same facility, location or provider”. It is also the capability to ensure links among all health providers in the care pathway. Finally, the efficacy/outcome of care constitutes the final result of services provided and it is measured by the patients' perceptions about the benefits gained through medical services and treatments.

Poor evidence is available in Italy about connections between perceived quality and the capability of the healthcare system to respond to patients' needs. The purpose of this paper is to investigate patient experience with GP assistance and to measure the impact of personal and organizational characteristics on overall satisfaction and on willingness to recommend one own GP to other people. The analysis is going to be described concerns the Italian contest of GP assistance.

In Italy, GPs work as independent contractors in the National Health Service (NHS). Each GP might assist a limited number of patients (no more than 1500 patients older than 13 years). In 2007 the average list size was 1.094 patients but significant differences are observable among Italian regions. In the same year 46.961 GPs operated in the country. NHS allows to patients to choose their GP in the area of Local Health Authority (LHA) where they live. GP has to guarantee opening hours in relation to the number of patients and his duties implies primary care, prevention, education, care of the diseases when it does not require a specialist, and orientation towards a specialist when necessary.

3. Methodology

In 2009 a sample survey was conducted in four Italian Regions - Liguria, Tuscany, Umbria and Piedmont- in order to observe the citizens experience with primary care services. In particular, services monitored were GP and General Paediatrician care, Specialist and Diagnostic Outpatient Services. Collected data was used to create four Patient satisfaction indicators which are part of a multidimensional system for the evaluation of Health Authorities. From 2008 these four Regions are members of a network: they compare the performance of their Health Authorities using a set of indicators that the Laboratorio Management e Sanità (LMeS) developed for Tuscany Region in 2004 (Nuti, 2008). The indicators are grouped in six dimensions: population health, regional strategies, clinical and quality output, patient satisfaction, employee satisfaction and efficiency.

3.1. Survey

A random sample of 15.554 citizens was interviewed (6.732 from Tuscany, 2.136 from Liguria, 1.692 from Umbria and 4.994 from Piedmont) by means of Computer-Assisted Telephone Interviewing (CATI). This technique is a suitable way to contact all population, also low literacy groups, to enter data while conducting interviews and to get results in a quick time (Coulter et al., 2009).

Sample size was defined to be representative of 18 years old population living in the geographical area of each Local Health Authority during the 2008. Population data were extracted from the National Institute of Statistics dataset of year 2008 (Istat, 2008).

Phone numbers were drawn from the telephone directories of the four Regions. It is a wide list that allows all the necessary replacements and to achieve the target sample. But it does not contain mobile phone numbers, consequently it was not possible to contact all the people who have not a phone at home (e.g. young people). This affected the

composition of respondents, thus during data elaboration weights considering age and gender were applied to make results representative of the resident population.

Only people who used primary care services during the twelve months before the survey were considered eligible to answer. In this way it has been possible to describe the most recent experience of citizens and not their general perception of primary care services.

3.2. Questionnaire

Patient experience with primary care was assessed using the "Citizens' Experience with Primary Care Services" (CEPCS) questionnaire created by LMeS. Questions were defined on the basis of a literature review and adapting international works to the Italian Health System (IHS). Before to be administered the questionnaire was shared with the management of regional government and in some case items related to the own characteristics of each Regional Health Service (RHS) were introduced. It was necessary because the organization of service or the way to provide assistance of GPs and General Paediatricians could be different in the four RHSs.

The CEPCS questionnaire consist of 83 items aggregated to 5 sections about GP service, General Paediatrician service, Specialist Outpatient Service, Diagnostic Outpatient Service and patient socio-demographic characteristics. In the first four dimensions on patient experience two filter-questions were used to select only eligible citizens: who used the public services provided in the regional area and who had an access during the previous year. Descriptive items were used in order to keep organizational elements and facilities' availability. For each service citizens experience and satisfaction were measured with "reporting" (3 point scales from "Always" to "Never" or from "Completely" to "No") and "rating" items (5 point scale from "Poor" to "Excellent") related to: home visit, continuity of care, communication, dedicated

time, involvement, trust in doctors, doctors technical skills and overall satisfaction.

With a pilot test and a next confirmatory factor analysis the validity and reliability of the items and dimensions were observed (Murante, 2009).

This study focuses on results related to patient experience with GP.

3.3. Statistical Analysis

Descriptive statistics were applied to observe the characteristics of respondents and the most relevant differences across the RHSs.

Two ordinal logistic regression models were performed (Lawson and Montgomery, 2006) in order to identify the predictors of overall experience. The overall evaluation of the assistance (“Overall, how would you rate the care provided by your General Practitioner?”) and the willingness to recommend GP services (“Will you recommend your General Practitioner to a member of your family or to your friends?”) were introduced in the model as independent variables.

Since respondents have been asked to state their satisfaction based on a five (in the case of overall satisfaction) and three (for the willingness to recommend) points scale, answers are only ordinally comparable. In other words we do not know what the relative distance between satisfaction answers is, but we assume that all individuals share the same interpretation of each possible answer.

The true level of satisfaction can be represented as a continuous, unobserved latent variable Y^* , which is equal to:

$$Y^* = x\beta + e$$

where the random disturbance term has a logistic distribution. Instead of Y^* we observe Y , our ordinal variable. We can think at Y as a collapsed version of Y^* , whose value depends on whether or not the

continuous variable Y^* crossed a particular, unknown, threshold ($\alpha_1 < \dots < \alpha_j \dots < \alpha_M$):

$$Y_i = 0 \quad \text{if} \quad Y_i^* \leq \alpha_1$$

$$Y_i = 1 \quad \text{if} \quad \alpha_1 \leq Y_i^* \leq \alpha_2$$

$$Y_i = M \quad \text{if} \quad Y_i^* > \alpha_M$$

where M is the number of categories of the ordinal dependent variable.

Then, we can estimate the probability that Y will take on any particular value through standard ordered logistic regression:

$$P(Y_i > j) = g(x\beta) = \frac{\exp(\alpha_j + x_i\beta)}{1 + \left[\exp(\alpha_j + x_i\beta) \right]}, \quad j = 1, 2, \dots, M - 1 \quad (1)$$

Note that ordered logit models are multi-equational models: they correspond to a series of binary logistic regressions where categories are combined. For example, if we want to analyse overall satisfaction, which is coded as a categorical variable with four outcomes, three separate equations are estimated: the first one compares one category (e.g. the most positive judgements) with a combination of the other two, while the second equation contrasts categories 1 and 2 versus the third one, etc. As a consequence, we get for each predictor a number of coefficients equal to $M - 1$.

However, the model (1) is based on the assumption that the relationship between each pair of outcome groups is the same. In other words, the proportional odds assumption forces the coefficients to be the same. Since this hypothesis is often violated, we test in our models its validity.

When the assumption is rejected, we estimate another model, by relaxing the proportional odds hypothesis for a subset of predictors. As a first step we identify those regressors for which the assumption holds and, as a second step, we estimate a new model where all other predictors' coefficients are allowed to change for each pair of outcome groups.

Following Williams (2006) we run a new model which is a hybrid between the one described by (1) and the generalised ordered logit model:

$$P(Y_i > j) = g(x\beta_j) = \frac{\exp(\alpha_j + x_i\beta_j)}{1 + \left[\exp(\alpha_j + x_i\beta_j) \right]}, j = 1, 2, \dots, M - 1 \quad (2)$$

where the Betas are not the same for each value of j .

3.4. The variables of the model

Recalling the distinction between determinants and components of satisfaction, two kinds of independent variables were introduced in the model, focusing on: patient socio-demographic characteristics (age, gender, educational level, job, overall health status perception, stays in hospital in the last year) and patient experience with GP service (waiting time, access mode, GP working model, personal health record, continuity with specialist care). Access to services was defined by a categorical variable (why patients give up a GP visit when he needs) and by a dummy variable (if patients ask a GP visit for administrative or clinical reasons). The second variable may be considered as a proxy of patient expectations, thus it is interesting to observe the extent to which the different purposes of GP visits (requests of administrative documents and prescriptions or medical check up) influence patient satisfaction.

A dummy variable related to RHS providers was introduced (with Liguria as reference region) in order to measure the effect of the

regional system on patient experience and on the willingness to recommend GP to others.

No variables related to the relationship between doctor and patient were introduced because the main aim of this study is to observe how the organizational elements of GP service affect overall satisfaction and the willingness to recommend it. A previous study conducted on citizens' experience in Tuscany (Vainieri, 2006) highlighted that the correlation between GP's personal skills (listening capability, kindness, clear communication) and patient satisfaction is stronger than the correlation between organizational elements and patient satisfaction. But it is not always possible to modify GP behaviour, while health providers may improve organizational aspects by changing technical aspects as waiting list procedures, continuity of care processes, and so on. Consequently, the analysis refers to service organization and the main tangible items helpful to define actions of improvement.

Table 1. Errore. Per applicare abstract al testo da visualizzare in questo punto, utilizzare la scheda Home.

Variables introduced in the model.

Name variable	%
Overall satisfaction (reference <i>Poor</i>)	
<i>Fair</i>	2,01%
<i>Passable</i>	10,22 %
<i>Good</i>	41,74 %
<i>Excellent</i>	45,23 %
Willingness to recommend (reference <i>No</i>)	
<i>Perhaps</i>	7,23%
<i>Certainly</i>	86,28%
Gender: male	47,78%
Age (reference 18 – 45 years)	
46 - 65 years	27,06%
> 65 years	22,08%
Education (reference <i>Primary school</i>)	
<i>Secondary school</i>	27,57%
<i>High school</i>	38,68%
<i>University degree</i>	13,40%
Job (reference <i>Employee</i>)	
<i>Student</i>	6,35%
<i>Housewife</i>	11,75%
<i>Unemployed</i>	2,88%
<i>Retired</i>	35,79%
Health status (reference <i>Very bad</i> or <i>Bad</i>)	

	<i>Passable</i>	47,80%
	<i>Very good or good</i>	43,0%
Hospitalization (reference <i>No</i>)		11,56%
Reason of access (reference <i>clinical</i>)		57,18%
GPs working together (reference <i>Yes</i>)		
	<i>No</i>	49,31%
	<i>I do not know</i>	21.74%
Waiting time (reference <i>No wait</i>)		
	<i><15 minute</i>	16,34%
	<i><30 minute</i>	24,69%
	<i><60 minute</i>	16,18%
	<i>> 60 minute</i>	20,41%
Personal record (reference <i>No</i>)		98,00%
Patient gives up to GP visit (reference <i>No</i>)		10,25%
Link with Specialist assistance (reference <i>LHA specialist</i>)		
	<i>Private specialist</i>	11,31%
	<i>Private specialist covered by RHS</i>	1,61%
	<i>A&E</i>	0,67%
	<i>No</i>	15,83%
RHS provider (reference <i>Liguria</i>)		
	<i>Piedmont</i>	31,77%
	<i>Tuscany</i>	43,28%
	<i>Umbria</i>	11, 01%

4. Results

The results of the two regression models are presented in Tables 2 and 3. The model validity was assessed by comparing the log --likelihood of the fitted model to the saturated model. The chi-square test on deviance model was statistical significant.

4.1. Effects of patient characteristics and expectations, organization of the service and region on overall satisfaction

According to Table 2 only some variables introduced in the model explain the patient satisfaction.

Referring to patient characteristics, age and education do not have a significant effect on satisfaction, contrary to results observed in other studies (Hall and Dornan, 1990). Females are more satisfied than males ($p < 0.05$). Looking at model B results, both men and women are satisfied, but the former are less enthusiastic in reporting their

satisfaction. Being student is predictable of high dissatisfaction with GP service compared with employed citizens ($p < 0.001$). Health status is significant and it appears that the better the health conditions are the higher the patient satisfaction becomes. Patients who have been hospitalized tend to be more dissatisfied (model B) and they are likely to define the assistance as “very bad”.

Patients who contact the GP for administrative reasons are less satisfied with the service than the others. As in the case about gender, model B estimates show how individuals who had access for administrative reasons are not necessarily dissatisfied with their GP but more “neutral” in assessing their contentment. Confirming previous studies [25], waiting time is strongly linked to satisfaction. Up to 30 minutes, delays seem to have a weak effect on satisfaction, as respondents are simply less generous in their evaluations (model B). However, if the size of the wait increases, judgements become more severe and cross the border between satisfaction and discontent.

Patients who have left the GP before the visit are less satisfied than people who did not ($p < 0.001$), and the effect is particularly relevant for the lowest category of satisfaction. Patients who knows that their GP use a medical record (on paper or electronically) are more satisfied than the others ($p < 0.05$) and, more in details, are less likely to define the service as “very bad” or “passable”.

Observing the differences in RHSs, only living in Umbria has a significant ($p < 0.005$) and positive effect on patient satisfaction (versus living in Liguria). The effect concerns in particular the highest ranks of satisfaction (good and very good). It might be interesting to investigate the content of the regional agreement between GPs and each RHS to identify the peculiar characteristics which might influence the primary care services.

Table 2.
Ordinal Logistic Regression model: Overall satisfaction as a dependent variable.

Variable	Ordered Logit	Generalised ordered logit (B)
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	(A)	1 (very bad)	2 (passable)	3 (good)
	Odds ratio		Odds ratio	
Male	0.904**	0.902	1.073	0.860***
Age: 46 - 65 years	1.041	1.036		
Age: > 65 years	0.977	1.280	1.243	0.915
Education: Secondary school	0.970	0.968		
Education: High school	0.889**	0.889**		
Education: Univ. degree	0.789***	0.791***		
Job: Student	0.649***	0.655***		
Job: Housewife	1.069	1.065		
Job: Unemployed	1.041	1.042		
Job: Retired	1.031	1.029		
Health status: Passable	1.198***	1.702***	1.331	1.154**
Health status: Very good or good	1.472***	1.465***		
Hospitalization: Yes	0.931	0.655**	0.784***	0.986
Reason of access: Administrative	0.844***	0.882	0.770***	0.866***
GPs working together: No	0.929*	0.929*		
GPs working together: I do not know	0.915*	1.133	1.032	0.884**
Waiting time: <15 minute	0.699***	1.377	0.932	0.658***
Waiting time: <30 minute	0.713***	1.216	0.930	0.669***
Waiting time: <60 minute	0.626***	0.967	0.726***	0.605***
Waiting time: > 60 minute	0.617***	0.634***		
Personal record: Yes	1.524***	3.514***	2.280***	1.162
Patient gives up to GP visit: Yes	0.364***	0.180***	0.324***	0.452***
RHS provider: Piedmont	1.048	1.048		
RHS provider: Tuscany	0.941	0.938		
RHS provider: Umbria	1.154*	1.291	1.051	1.181**
Cut point1	-3.859***			
Cut point 2	-2.049***			
Cut point 3	0.154			
Constant		2.731***	1.464***	0.167
Log likelihood	-11136.304		-11,047.705	
LR chi ² (Wald-chi ²)	519.56		719.16	
Observations	11,024		11,024	
*p<0.05 **p<0.01 ***p<0.001				

4.2. Effects of patient characteristics and expectations, organization of the service and region on willingness to recommend the GP

Table 3 displays the estimations of other two models, where the willingness to recommend works as the dependent variable.

Table 3.

Errore. Per applicare abstract al testo da visualizzare in questo punto, utilizzare la scheda Home. **Ordinal Logistic Regression model: Willingness to recommend as a dependent variable.**

Variable	Ordered logit (A)	Generalised ordered logit (B)	
		1 (no)	2 (maybe)
	Odds ratio	Odds ratio	
Male	1.147	1.145	
Age: 46 - 65 years	1.372***	1.373***	
Age: > 65 years	1.561***	1.561***	
Education: Secondary school	0.780**	0.780**	
Education: High school	0.692***	0.693***	
Education: University degree	0.583***	0.584***	
Job: Student	1.099	1.097	
Job: Housewife	1.034	1.033	
Job: Unemployed	1.025	1.903	0.960
Job: Retired	1.006	1.006	
Health status: Passable	1.433***	1.588***	1.413***
Health status: Very good or good	1.591***	1.587***	
Hospitalization: Yes	1.002	0.813	0.736***
Reason of access: Administrative	0.736***	0.735***	
GPs working together: No	1.088	0.896	1.111
GPs working together: I do not know	1.083	1.083	
Waiting time: <15 minute	0.938	0.942	
Waiting time: <30 minute	0.979	0.977	
Waiting time: <60 minute	0.899	0.899	
Waiting time: > 60 minute	0.716***	0.715***	
Personal record: Yes	2.573***	3.310***	2.400***

Patient gives up to GP visit: Yes	0.303***	0.302***	
Specialist visit: Private specialist	0.767**	0.655***	0.778**
Specialist visit: Private specialist covered by RHS	1.400	1.411	
Specialist visit: A&E	0.494*	0.489**	
Specialist visit: No	0.436***	0.391***	0.442***
RHS provider: Piedmont	1.141	0.933	1.160
RHS provider: Tuscany	1.042	1.039	
RHS provider: Umbria	1.195	1.199	
Cut point 1	-2.141***		
Cut point 2	-1.232***		
Constant		2.060***	1.290***
Log likelihood	-3,569.352		-3,552.333
LR chi ² (Wald-chi ²)	527.25		569.67
Observations	8,437		8,437

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

By considering the patient characteristics, citizens older than 45 years seem to recommend more easily their GP than young people, as observed in previous works. The same evidence applies to over 65 patients. This result could be related to the education level: people who attended primary school (taken as reference in the models) recommend more easily their GP compared with the others. Moreover, an increase in the level of education corresponds to a decrease in the probability to recommend one own GP.

No effect seems to link gender to satisfaction. Since females were more satisfied than males, this support previous studies concerning the lack of a clear relationship between gender and patient satisfaction [15], and the general hypothesis that the determinants of patient satisfaction and willingness to recommend might be different.

The worst the health conditions the lower the willingness to recommend the physician, a symptom of dissatisfaction with the service provided by the GP.

No significant effects are observed for job profile.

Patients who primarily contact their GP for health reasons not only are more satisfied but they are even more willing to recommend him to friends and relatives ($p < 0.001$).

The waiting time becomes less relevant. It is significant only in the case of very long waits: more than half an hour ($p < 0.05$) and an hour ($p < 0.001$). The more people wait, the more they become unwilling to recommend their GP.

Patients who have left the GP before the visit are less inclined to recommend him than people who did not ($p < 0.001$).

The use of a medical record by the GP increases by 2.6 times the probability to recommend him ($p < 0.001$). An explanation could be that it is a tangible element which makes the patient understand the service characteristics [26]. In particular, the use of personal record reduces the probability to answer "no" to the question (model B).

Compared with the previous model, we included in the regression the results from the question about the connection between GP service and specialist visits.

Among patients who need a specialist visit, those who have been suggested to contact a private specialist are more unsatisfied with GP ($p < 0.01$) than people who have been suggested a LHA specialist. Who did not receive any suggestion from their GP are the most unsatisfied with him. These results could be explained considering that in the first case people must contact a doctor outside the HIS (with also the related problems in booking the visit) and have to pay for his care. Instead, in the second case probably patient perceives to be abandoned and that there is a lack in the continuity of care.

5. Conclusions

In this work we presented the results of a survey conducted in four Italian regions about patients' satisfaction with GP services. One peculiarity which characterises survey studies of this kind is the low

number of people expressing discontent with their care [27]. Moreover, considering all health care providers, GP often result as the preferred ones [28]. This phenomenon has already pointed out by many authors and Sitzia and Wood [11] underlines how researchers are often forced into comparing positive with less positive answers. The evidence analysed in this work does not represent an exception: about 87 percent of patients defined the healthcare assistance they received as “good” or “excellent”, while about 86 interviewees out of 100 would recommend their own GP to other people. For this reason the analysis has been carried on by comparing two models: a standard ordered logistic regression and a generalised ordered logit model, in which coefficients are free to vary across satisfaction’s levels.

The study aimed at analysing how the organizational elements of GP service affect overall satisfaction and the willingness to recommend it, and to identify the strategic areas to improve the capability of the healthcare system to respond to patients’ needs.

The results support our hypothesis concerning the relevance of some organizational aspects.

In particular, there are two different aspects of organization that apparently matter. The availability of personal record, which is a tool to ensure the transferability of patient health history and that takes track of therapies, specialist visits provided by all actors of health system, affects both overall satisfaction and willingness to recommend. GP suggestions about specialist visit (tested only in connection with the willingness to recommend), can be considered as elements related to the continuity of care. By indicating a private specialist visit or by not suggesting any doctor to contact, the GP does not provide a continuous pathway in the system. Evidence shows that the more the GPs ensure the continuity in the service, the more the patient is inclined to suggest his GP to friends and relatives. Last behaviour implies a higher conviction about the service provided [29].

Other aspects are more linked to the day-to-day service organization. GPs working together (a working model remunerated in the RHS contracts) do not have a strong effect on patient satisfaction, while other elements (patient giving up and waiting times) are more relevant. The question about the patient giving up, in fact, surveys the organizational reasons (such as wait too long due to the presence of a large number of patients, GP working hours..), while long waits are clearly related to organizational problems.

With reference to the different purpose of GP visits (for the request of administrative documents and prescriptions or for medical checks), an influence on patient satisfaction and willingness to suggest the GP is observed. People who contact the GP for administrative documents are less satisfied. Not large evidence is available in the literature about this topic. This result might be explained assuming that there are low expectations for technical capability because he is considered as a simple provider of prescriptions.

Shifting our attention to socio-demographic characteristics, elderly seem to be more likely to recommend their own GP compared with young people, whilst apparently the age of the respondent does not affect perceived satisfaction.

The overall health status perception and educational level appear to be a consistent determinant of both satisfaction and willingness to recommend. The healthier people are, the more they are satisfied and disposed to suggest their GP, while the opposite behaviour is connected to higher educated patients.

By considering the socio demographic composition that population will have in the next years and the new needs related to seeing the person in the patient, it might be opportune to define new challenging strategies, concerning the GP role towards the patients and in the clinical pathways.

6. Summary and future research directions.

In the last decades the attention paid to patients' satisfaction largely increased. From a practical point of view, surveys can provide useful evidence to policy-makers. From a theoretical perspective, a broad literature investigated the connections between satisfaction and individual characteristics, group-specific features and aspects of the service. In general, our results are consistent to previous literature, even if the inclusion of some information about the organization of the GP service allows us to link them to perceived satisfaction.

Data based on patient experience, collected by surveys, can be considered a valid starting point for performance indicators [30]. While administrative data on patient behaviours (such as patients who leaves the hospital against the medical advice, or patients using Accident & Emergency Department for no serious problems instead of being visited by the G, etc.) return an indirect measure of his evaluation of service quality, sample surveys allow to know patient experience directly through his eyes.

As previously stated, to make health services more patient-centered, it is very important the evaluation of his perception of health services quality and its determinants: systematic patient surveys and statistical analysis of the data are therefore a valuable tools for health system managers. In fact, they allow to understand the strengths and the weaknesses of the health services offer and to consequently reorganize them.

Further research is therefore needed in order to better understand and define the elements which drive patients' perceptions. In particular, referring to our study, the analysis could be extended to patients' contentment with particular aspects of the GP service (punctuality, accessibility, etc.), in the aim of understanding how the latter contribute to overall satisfaction.

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