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### **INFORMAL PAYMENTS IN ROMANIAN HEALTH CARE SYSTEM. A SAMPLE SELECTION CORRECTION**

*Bianca BULIGESCU, Henry ESPINOZA PEÑA*

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# INFORMAL PAYMENTS IN ROMANIAN HEALTH CARE SYSTEM.

## A SAMPLE SELECTION CORRECTION

Bianca BULIGESCU<sup>1</sup>, Henry ESPINOZA PEÑA<sup>2</sup>

### Abstract

This paper draws on economic theory, sociology and political science approaches to explain informal payments in the Romanian health care system. It estimates the likelihood of paying a bribe (informal payment) using a reduced health care demand equation in a probit model with sample selection correction. Social capital, as having a relationship with doctors, and the perception of the health care system, as corrupt, are found to influence the probability of making an informal payment. The likelihood of making an informal payment in the Romanian health care system is modelled using a maximum-likelihood probit estimation with sample selection correction. In the selection equation, reduced health care demand, self-perceived health status and being afraid of diseases are used as exclusion restrictions for identifying the parameters of the econometric model.

*Keywords:* corruption; informal payments; informal patient payments; social capital; sample selection; probit model with sample selection correction; reduced demand in health care; East-Central Europe.

*Cuvinte-cheie:* corupție; plăți informale; plăți informale ale pacienților; capital social; selecție a eșantionului; modele probit cu corecție a eșantionului selectat; model de cerere redus în sistemul sanitar; Europa Centrală și de Est.

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<sup>1</sup> Research Institute for Quality of Life, National Institute for Economic Research “Costin C. Kirițescu”, Romanian Academy, 13 September Road no. 13, District 5, 050711, Bucharest, Romania. E-mail: bianca.buligescu@iccv.ro

<sup>2</sup> Ministry of Economy and Finance, Jr. Junín 319, Cercado de Lima, Lima-Peru, Peru. E-mail: hespinoza@mef.gob.pe.

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## INTRODUCTION

*Atenție* is the Romanian word defining an informal payment (in the form of money, gifts or services) in addition to the cost of the services paid to the physicians, doctors and nurses in the Romanian public health care system<sup>2</sup>. Some figures, calculated from the Barometer of public opinion 2004-2005, indicated that the payment of “*atenție*” was widespread. About 30% of the population older than 18 years old has been involved in informal payments to receive medical care in 2005. In 2017, the figure was 18% according to Eurobarometer 470<sup>3</sup>. Additionally, based on figures from Lewis (2002) and the World Health Organization (WHO) data set, Romanians spend around 450 mills US PPP\$ in “*atenție*”. The out of pocket payments for health care in Romania is at one of the highest levels paid in Europe.

This study aims to assess the profile of the informal payer and to investigate the mechanisms of paying a bribe in the health care system. The paper’s contribution is twofold. First, it sheds light on the perception of corruption in the health care system and the social capital as determinants of the probability of making an informal payment. Second, it circumvents potential biases in the estimation of the likelihood of making an informal payment, given its nature as a binary variable, by using a probit model with sample selection correction.

The phenomenon of informal payments in the health care system is widespread in Central and Eastern Europe. Studies conducted by Kornai (2000) and Lewis (2002) suggest that gratitude payments are affecting the provision of health care in post-communist countries like Hungary and Poland. Gaal (1998) indicates a positive correlation between informal payments in health care, and the publicly controlled health care systems. Belli (2002) provides further information regarding the allocation of payment types across different health care facilities. Thus, in the Czech Republic, Hungary, Poland and Romania formal payments<sup>4</sup> are mostly associated with primary and outpatient specialist care, whereas informal payments are more associated with surgery and inpatient care. Informal out of pocket payments are important since they maintained the Romanian health care system functional in the context of under-funded budgets and low wages paid to the medical staff (See Fig.1 and 2 from the Annex).

The paper is divided in seven sections. In the next section, a theoretical background is presented. It discusses three approaches to informal payments in health care systems: an economic approach, a sociological approach and a political science approach. The third section provides a description of the Romanian health care system illustrating some of the theoretical concepts discussed. The fourth, fifth and sixth section are devoted to develop the model, describing the data and discussing the results, respectively. Finally, the seventh section concludes.

## THEORETICAL BACKGROUND

Informal payments in health care are defined as “payments to individual and institutional providers, in kind or in cash, which are made outside official channels”. This encompasses “«envelope» payments to physicians and «contributions» to hospitals as well as the value of medical supplies purchased by patients and drugs obtained from private pharmacies but intended to be part of government-financed health care services” (Lewis, 2007). Since medical staff is using their positions for private gains and patients are expected to provide an extra payment for something they were entitled to receive, informal payments can be seen as an act of corruption.

Gupta et al. (2000) show that across countries there is a strong correlation between corruption and service provision, countries with less corruption and higher predictability of corruption have better quality health care and more efficient provision of public services.

The phenomenon of informal payments in health care systems is analysed from three perspectives. First, an economic approach emphasizes the role of incentives and market failures (Ensor, 2004); as well as the role of government failures (Balanova and McKee, 2002). Second, a sociological approach emphasizes the roles of institutions and the culture of gratitude payments placing the phenomenon into a context of informal economies (Kornai, 2000). The role of the communist past plays the main reason for generating a second parallel economy in which fostering relationships with providers of goods and services is the key to access scarce resources (Ledeneva, 1998). Third, a political science approach emphasizes the lack of accountability and control (Lewis, 2002, 2007) as well as the lack of government legitimacy (Rose-Ackerman, 2001).

### *THE ECONOMIC APPROACH*

Economic theory can give insights first with respect to problems inherent in the nature of health care as a good and second with respect to incentives and failures that derive from its nature and from the interplay of demand and supply in the market.

Preker and Harding (2000) emphasize the fact that health care activities produce externalities and they are not pure public goods as they have some elements of exclusion, and rivalry making them private goods and hence marketable<sup>5</sup>.

Economics also emphasizes that health care by nature is a good that has problems like: a) asymmetry of information, which makes patients reliant on doctors; b) adverse selection, making the market reluctant to insure the most vulnerable; and c) moral hazard of over-consumption and over-production.

Given the nature of health care as a good, social insurance systems have been organized to pool the risk of sickness over the population, diminishing the costs paid by the most vulnerable and addressing the adverse selection problem.

The asymmetry of information between the patients and the health care provider and between the doctor and the health care administrators, gives the doctor a key power position in the delivery of health care that can be used to extract rents (Ensor, 2004). In this line of analysis, monopolies can occur due to: (a) legal restrictions on competition; (b) access to subsidized capital and revenues, creating an uneven “playing field”; (c) below cost distribution of goods and services to achieve equity goals; or (d) production of public goods or goods where markets are not viable (Preker and Harding, 2000).

The monopolies of health care occurred during communism in most Central and Eastern European countries. These systems are funded directly from the government budgets and publicly provided.

The nationalization of the health care sector led to an increased demand (Gaal and McKee, 2004). This increased demand was not matched by increased funding, creating shortages in supply (Gaal and McKee, 2004).

The low funding levels meant scarce human resources and scarcity of equipment. This was coupled with constraints on the number of bed days and the fact that funding was given based on the levels of past demand (Ensor, 2004). The gap between the available resources and those required can lead to several responses (Ensor, 2004):

- a) health care workers can reduce quality of health care and treat patients below the required standard;
- b) health care workers reduce the numbers of patients treated by increasing the number of days of treatment and create queues;
- c) health care workers reduce both the treatment and the numbers of patients treated;
- d) health care workers can reduce the number of hours worked, and moonlight since they are not appropriately remunerated in the public system (Gaal and McKee, 2004).

Patients can reduce the gap between the budget and the cost of health care by paying for medical supplies, drugs necessary for their treatment and buying their food (in case of inpatient care). Informal payment can also increase the salaries of the medical staff up to their reservation wage ensuring that they do not change their occupation and that they have incentives to provide health care (Ensor, 2004).

Health care workers can also exploit their power and market position to extract rents from patients. Market power derives from a position of monopoly and the principal-agent relationship existing between practitioner and patient (Ensor, 2004). The health care worker can delay treatment until informal payment is done, create a bottleneck in the provision of the service and afterwards rationing to those that pay (Ensor, 2004) Thus health care workers can demand a contribution which is higher than the average cost of the treatment. Its level is higher if the probability of being caught and punished is low.

Health care workers can also offer additional services or higher quality of treatment for which they require informal payments. From a different perspective, they can also capitalize on information asymmetry to maximize income by providing unnecessary services (Gaal and McKee, 2004).

To sum up, *on the demand side*, informal payments can serve for multiple purposes: jumping the queue, shortening the duration of waiting for the treatment, and receipt of more care. To these are added increasing the quality of the medical service, obtaining drugs or ensuring the receipt of care in all instances, even when the medical staff has poor motivation, moreover, insurance against future care needs, access to care from specialists with good reputation (Lewis, 2007). Whereas, *on the supply side*, informal payments could be seen as a way to finance the costs of care, a way to increase performance or as rent-seeking by adding an extra price for making use of a scarce service on the market (Kornai, 2000). They could be used for private purposes or they could be used to fill in the lack of medical supplies required for the functioning of the service (Lewis, 2007).

### THE SOCIOLOGICAL APPROACH

From a sociological perspective, traditions of gratitude inherited from communism generate informal payments (Kornai, 2000) as well as the tradition of “the use of personal networks and informal contacts to obtain goods and services in short supply and find a way around formal procedures” and bureaucratic rigidities (Ledeneva, 1998). During communism, making favours in exchange for other services and goods created an informal second economy in which networks were built (Ledeneva, 1998). From this perspective, fostering a relationship with a health care worker through informal payments can act as insurance in case of future health care needs. According to Richard Rose (1998) “social capital is defined as the stock of formal and informal networks that individuals use to produce or allocate goods and services”. Social capital is therefore about recurring relationships between individuals. An alternative approach (Rose, 1998) “treats social capital as a social psychological or as cultural beliefs and norms in Inglehart’s view (1997, 188) «a culture of trust and tolerance in which extensive networks of voluntary associations emerge»”. Therefore, in this view social capital is seen as a predisposition to cooperation and trust which is essential for both political and economic cooperation.

The communist legacy stands for lack of government legitimacy and the perception of rules as irrational. Rose-Ackerman (2001) draws attention on the fact that there is a communist legacy leading to low levels of trust in institutions and a habit of relying on inter-personal relations not on public institutions and laws. This can explain the perception of the health system as being corrupt and the habit of relying on interpersonal relations with medical providers.

### *THE POLITICAL SCIENCE APPROACH*

The political science perspective emphasizes the lack of accountability of the health care providers, the inability of the government to enforce the rule of law and lack of private alternatives (Lewis, 2002, 2007; Rose-Ackerman, 2001; Kornai, 2000). The government did not want to spend more on health care and it overlooked informal payments, as they were a way to fund the deficits. From a political science approach the perception of the health care as corrupt can influence the probability to make an informal payment.

### *OUTCOMES OF MECHANISMS*

Informal payments have consequences both on efficiency and equity grounds. From an efficiency point of view, the allocation of health care is likely to be distorted away from the optimum given that patients with higher resources are served before those unable to provide informal payments (Ensor, 2004). From an equity point of view, informal payments can be barriers in receiving and accessing care for poor patients and they create inequity in the distribution of health care. Studies prove that poor people give a larger share of their income in informal payments compared to rich people (Lewis, 2002, 2007) and that informal payments are highly regressive (Szlander and Cuyler, 2006).

The main mechanisms discussed in this section are further illustrated in the case of the Romanian health care system.

## **THE HISTORICAL DEVELOPMENT OF THE ROMANIAN HEALTH CARE SYSTEM AND THE FACTORS FAVOURING “ATENȚIE”**

The Romanian health care system includes a public system based on social insurance and a private system funded by private insurance or out of pocket pay for the consultation or service provided. Doctors that work in the public system work in the private system as well increasing their wages. The Romanian health care system has been largely underfunded leading to poor quality of health services provision, inefficiency, inflexible norms and inadequate health care equipment and facilities (European Observatory on Health Care Systems, 2000). In 2014 5.7% of the GDP was spent on health care according to WHO estimates compared to Germany and Austria where around 11% of GDP is spent on health care. At EUR 814 per capita (adjusted for differences in purchasing power), Romania spends under a third of the EU average, the lowest level of all Member States on health care (OECD, 2017). According to OECD (2017) out-of-pocket spending comprises one fifth of total health care expenditure, and includes direct and informal payments, affordability is the main reason for reported unmet health care needs.

According to the OECD (2017) although strengthening primary care has been on the policy agenda since 1990, primary and community health care services are still underprovided, and under-used, and there continues to be inappropriate use of inpatient and specialised outpatient care, including care in hospital emergency departments. Moreover, few resources were allocated for primary care and the majority was targeted at funding hospitals causing scarcity of medicine and equipment for general practitioners. Consequently, many Romanians had little confidence in primary care and often sought care directly from the specialist and hospitals facilitating informal payments (Vladescu and Radulescu, 2001).

As the majority of Eastern European health care systems, the Romanian health care system was organized according to the centrally-coordinated Semashko health care system, which was state financed (Bara, van den Heuvel, and Maarse, 2002) through the State Law on Health Organization passed in 1949. During the communist regime, the health system maintained the principles of universal coverage and free access, as well as health care at the point of delivery.

Primary health care in Romania had been provided mainly by dispensaries, which had been part of the hospital system and had served as primary health care centres for the population living in the area. Health care workers had a civil servants status (Bara, van den Heuvel and Maarse, 2002), and this had a major influence on their economic behaviour. This meant that doctors lacked monetary incentives to continue attending the patient other than their moral ethics, as wages were not defined by performance, but using fixed rates<sup>6</sup>.

The organization and financing of the health care system has begun a process of reform from 1997 onwards. Law 145/1997 introduced social insurance funding based on mandatory defined contributions separating service provision from financing by creating the National Health Insurance House and its local branches<sup>7</sup>. In 1997, Romania introduced a modified Bismarck model, which became effective since 1999 meaning the system is funded by social health care insurance depending on income (Stanciu, 2013). The law that governs the actual health care system is Law 95/2006, which has incurred numerous modifications throughout the time. According to Paun (2017), the health care system underwent a transition during the last three decades from a centralized system to a contract based system in which the health care providers make contracts with health insurance houses, which offer services to the population.

Health funding was supplemented with state budget complementary funds. The insurance covered a medical services package, which unfortunately was not clearly defined. The reform also established a new way of payment for the health care providers: since 1997 primary care physicians are paid by capitation<sup>8</sup> (Law 145/1997). This meant that they had more incentives to spend their time attracting new patients than treating those already registered with them, while fee-for-service arrangements were used for ambulatory specialised care (former polyclinics), and



global budgets and salaries for hospitals (inpatient care)<sup>9</sup>. Patients were able to choose their general practitioner.

Health care was free for any medical condition, free annual check-ups, and drugs were subsidized (at least 50%). Despite the provisions, patients had problems in accessing health care, they complained of long queues for appointments and shortages or limited availability of medicines and investigations (Schneider, 2007). Payment by capitation did not diminish the informal payments since the doctors' wages remained low and the health system continued to be under-funded. The salaries of the doctors were up to 80% of the average salary until 2005. In 2018 due to increased migration of the medical staff, the salaries of doctors were increased up to 70%, which meant they could earn more than the average wage in order to curtail brain drain but despite efforts, they remain low compared to other potential earnings abroad.

## **MODELING THE LIKELIHOOD OF MAKING AN INFORMAL PAYMENT IN THE ROMANIAN HEALTH CARE SYSTEM**

Recent literature looks at informal payments through the lens of institutional theory (Williams and Horodnic, 2017). Most papers use a simple regression to model the willingness of the probability of paying a bribe using micro-data (Williams and Horodnic, 2017; Stepurko et al., 2015; Guerrero and Rodríguez-Oreggia, 2005).

The aim of this study is to calculate the propensity of making an informal payment in the Romanian health care system. We develop a model that takes into account the perception of corruption in the health care system and the role of social capital (having friends or relatives in the health care system). Due to the binary nature of the informal payment variable (*atenție*) and a potential incidental truncation (Wooldridge, 2010, 802; Greene, 2012, 872), we estimate a binary response model (probit) with sample selection correction (van de Ven and van Praag, 1981). The potential incidental truncation or sample selection bias refers to the fact that we can only observe the behaviour, regarding informal payments in the health care system, of those individuals who actually use the health care system. Thus, we estimate a model with two equations. On the one hand, we estimate the probability of using the health care system. This equation is called the selection equation. On the other hand, we estimate an equation of the likelihood of paying an informal payment only for those individuals in the sample who actually use the health care system. This equation is called outcome or structural equation.

The binary response model (probit) with sample selection correction was first proposed by van de Ven and van Praag (1981). To correct for sample selection with a binary dependent variable in the structural equation, van de Ven and van Praag

(1981) apply a methodology based on sample selection correction procedure, the so-called Heckit (Heckman selection model) after Heckman (1976) and Heckman (1979).

We estimate the propensity of making an informal payment in the Romanian health care system using the van de Ven and van Praag (1981) approach. The outcome (or structural) equation calculates the likelihood of making a gratitude payment based on demographic and labour related variables (including income) and the perception of corruption in the health care system and social capital (counting on reliable doctors within their network). The selection equation assesses the probability of using the health care system based on the self-perception of health that is also used as exclusion restriction in the structural equation.<sup>10</sup>

The selection equation (likelihood of health care utilization) could be considered an estimation of the demand for health care, which is derived from the basic demand for health (Grossman, 1999). These kind of models use proxy variables of the consumption of health care (e.g. number of visits to the doctor) and are estimated through Poisson models or ordered probit models (Grossman, 1999; Vork, 2000). In this study, we use the van de Ven and van Praag (1981) approach to estimate a sort of reduced form of health care demand. We model the health care demand in a binary dependent variable setting (using utilization of health care system as dependent variable in the selection equation). Since the likelihood of gratitude payment in the health care system is only observed for those that use the system, the binary response model (probit) with sample selection correction is applied.

The binary response model (probit) with sample selection correction allows us to model the decision of making an informal payment in the health care system since this decision is only observed for those individuals who attended the health system in the period of reference. The selection process is not a random one, but a process that can be characterized and measured. It is possible to calculate the likelihood of going to the health care facilities based on observed characteristics of the population in the sample.

For the empirical strategy, we apply the latent utility approach. We assume that every individual ( $i$ ) in the sample optimizes his/her decision in order to maximize

the utility:  $U_i$ . The decision we are interested in is making an informal payment

in the health care system (“*atenție*”):  $A_i$ .  $A_i$  is a binary variable which indicates

whether the individual ( $i$ ) makes an informal payment ( $A_i = 1$ ) or does not

( $A_i = 0$ ).

Each individual ( $i$ ) faces two possible state specific utilities:

$U_{i,A=1} = X_i' \beta_1 + u_1$ , when the individual ( $i$ ) makes an informal payment; and

$U_{i,A=0} = X_i' \beta_0 + u_0$ , when the individual ( $i$ ) does not make an informal payment.

$X_i$  is a vector of demographic, labour related, social capital, corruption and income variables.  $\beta_1$  and  $\beta_0$  stand for the coefficients.  $u_1$  and  $u_0$  represent the disturbances terms. Under this characterization, every individual ( $i$ ) would make an informal payment if the utility of doing so ( $U_{i,A=1}$ ) is greater than the utility in the alternative case ( $U_{i,A=0}$ ). Thus, we model the probability of making an informal payment in the health care system as:

$$\begin{aligned} A_i &= 1 \left[ U_{i,A=1} > U_{i,A=0} \right] \\ &= 1 \left[ X_i' \beta_1 + u_1 > X_i' \beta_0 + u_0 \right] \\ &= 1 \left[ X_i' (\beta_1 - \beta_0) + (u_1 - u_0) \right] > 0. \text{ [Eq. 1]} \end{aligned}$$

Since it is not feasible to identify both parameters ( $\beta_1$  and  $\beta_0$ ), we take the difference and make an implicit transformation for the likelihood of making an informal payment based on the latent utility ( $U_i^*$ ) approach and the result of Eq.

1:

$$\begin{aligned} A_i &= 1 \left[ U_i^* > 0 \right] \\ &= 1 \left[ X_i' (\beta_1 - \beta_0) + (u_1 - u_0) > 0 \right] \\ &= 1 \left[ X_i' \beta + u_i > 0 \right] \text{ [Eq. 2]} \end{aligned}$$

For purposes of the empiric strategy and the binary nature of  $A_i$ ,  $u_i$  represents an unobservable stochastic error. From Eq. 2 and the latent utility, we model the structural equation as:

$$\Pr(A_i = 1|X_i) = \Pr(X_i'\beta + u_i > 0|X_i) = \Phi(X_i'\beta) \quad [\text{Eq. 3}]$$

Where  $\Phi(\cdot)$  represents the standard normal cumulative distribution function. As previously stated,  $A_i$  is only observed for those who make use of the health care system. The selection into health care utilization is modelled by a binary variable  $H_i$  that takes the value of 1 when the individual uses the health care system and 0 when he does not. Based on a latent variable ( $H_i^*$ ) approach, we model the selection equation as:

$$H_i^* = Z_i'\delta + v_i, H_i = 1[H_i^* > 0]$$

$$\Pr(H_i = 1|Z_i) = \Pr(Z_i'\delta + v_i > 0|Z_i) = \Phi(Z_i'\delta) \quad [\text{Eq. 4}]$$

Where  $Z_i$  is a vector containing  $X_i$  and the exclusion restriction variables, in this case self-perception of health.<sup>11</sup> To estimate the probability of making a gratitude payment with a sample selection correction, we assume a bivariate probit model formulation with an error term  $e \equiv (u_i, v_i)$  independent of  $X_i$  and  $Z_i$  with a bivariate normal distribution. Particularly,  $e | (X_i, Z_i) \sim N(0, \Omega)$ .  $\Omega$  is the  $2 \times 2$  matrix with ones down its diagonal and off-diagonal element  $\rho = \text{Corr}(u_i, v_i)$  (Wooldridge, 2010, 595). Under these assumptions, we write the model of the probability of making an informal payment in the health care system like:

$$\Pr(A_i = 1 | H_i = 1, X_i, Z_i) = E[\Pr(A_i = 1 | v_i, X_i, Z_i) | H_i = 1, X_i, Z_i]$$

$$= E \left\{ \Phi \left[ \frac{(X_i'\beta + \rho v_i)}{(1 - \rho^2)^{1/2}} \right] | H_i = 1, X_i, Z_i \right\} \quad [\text{Eq. 5}]$$

To provide consistent, asymptotically efficient estimates for all the parameters, Eq. 5 is calculated with a maximum-likelihood probit model with sample selection correction. If  $\rho \neq 0$ , the standard probit techniques applied to Eq. 5 yield biased results. We test indirectly the presence of selectivity by testing the null hypothesis of independence of the selection and the outcome equation  $H_0 : \rho = 0$

## DATA

To estimate the model proposed in the previous section, the Public Opinion Barometer Survey (POBS) from May 2005 is used. Although data that is more recent is available, such as Eurobarometer 470 conducted in 2017, this dataset contains information only on social capital in the health care system. POBS 2005 data were collected by The Gallup Organization Romania for the Soros Foundation<sup>12</sup>.

The POBS's sampling was representative for the Romanian population over 18 years old, with an error of +/- 3% in 2005. The sample was built as a stratified sample probabilistic with three-stages sampling. The stratification criteria were: 18 cultural areas grouped in historical provinces, residential areas (urban-rural), 4 types of sizes, 3 degrees of development of rural villages and towns. To select respondents, the last electoral lists have been used. Data were checked for consistency comparing its results with the National Statistics data and the results from 1992 and 2002 censuses. No weighting procedure was applied.

Among the several years of data available, only the 2005 survey provides enough variables to estimate the probability of making an informal payment in the Romanian health care system (*atenție*). Among its questions, POBS 2005 includes a variable identifying whether people, that have used the health system, have paid an *atenție*<sup>13</sup>. The question regarding health care demand, which is our dependent variable for the selection equation is framed as: "In the last five years did you go to the doctor for a consultation, treatment or surgery?". The question regarding informal payments which is the dependent variable in our outcome equation is framed as: "If you went to the doctor, did you give anything else (money, gifts, services) than the legal fees?".

The POBS 2005 contains variables related to the perception of corruption in the health care system: "In your opinion how spread do you think corruption is among doctors?". Further, it includes a variable measuring social capital which is framed as: "Do you have relationships, or acquaintances on which you can count in case you get sick for a consultation, treatment or surgery?".

As a proxy of the health status, we use an indicator of subjective health status that is framed as: "How satisfied are you with your own health? This question is translated into a binary variable, where 1 means satisfied. The data does not

contain any other variables measuring health status. However, since people who are afraid of getting sick could be more likely to use the health care system, we proxy this by using a variable regarding personal fears. This variable measures: “Which are the issues that you are most afraid of currently?”, which have options such as: 1. prices; 2. war; 3. disease; 4. unemployment; 5. crime; 6. social unrest; 11. the future of my children; 12. terrorist attack; 95. something else; and, 97. I am not afraid of anything.” These categories have been grouped in afraid of getting sick, afraid of other issues and not afraid of anything.

The POBS 2005 data contains information regarding demographic variables like: gender, age, education, experience with migration, household size, area where the person lives and residential size area. Additionally, it includes important variables concerning the labour market status, for instance: employment status, present or last occupation, and last monthly household income<sup>14</sup>. Since the variable measuring current occupation combines information regarding sector of employment and job type, we decided to construct a new variable measuring risky occupations. Blue-collar workers and people working in the agriculture are considered risky jobs as they imply hard physical work.

POBS 2005 data sheds some light about the extent to which Romanian citizens are involved in informal payments to their health providers. About 33% of the citizens were involved in these activities during the year 2004, whereas the percentage correspondent to 2005 is 41%. These figures are consistent with the figures obtained by a study of the World Bank (2001) which observes 42% of the households having encountered bribery in the last 12 months. According to latest Eurobarometer 470, this figure was 18% of the people who went to see a doctor in 2017.

Since our model takes into account the possibility of selection in using health care, Table 1 from the Annex introduces the variables used in the analysis, whereas Table 2 presents some statistics of those variables. Means and standard deviations are provided to compare individuals that have used the health system in the last 5 years to those who did not use the system. Additionally, last column of Table 2 presents the results of tests on the equality of proportions comparing the samples of those who use the health care system with those individuals who do not use it. The p-value indicates whether the null hypothesis of the equality of the proportions should be rejected or not.

Table 2. Romania (2005) Summary Statistics

Descriptive Statistics	Total		Health Care Users		Not Health Care Users		Mean Test 1/	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	p-Value
Sample size	N=1,618		N=1,229		N=389			
Informal payment health care system			0.412	0.492				
Corruption								
Perception corrupted health care system	0.583	0.493	0.579	0.494	0.594	0.492	-0.014	0.613
Social capital	0.292	0.455	0.318	0.466	0.211	0.408	0.107	0.000
Health perception								
Happy own health	0.494	0.500	0.430	0.495	0.694	0.461	-0.264	0.000
Afraid diseases	0.345	0.476	0.382	0.486	0.231	0.422	0.150	0.000
Afraid other things	0.406	0.491	0.373	0.484	0.509	0.501	-0.136	0.000
Income Perception								
Not enough	0.392	0.488	0.386	0.487	0.409	0.492	-0.022	0.433
Income Deciles								
First	0.099	0.299	0.094	0.291	0.116	0.320	-0.022	0.203
Second	0.106	0.308	0.094	0.292	0.144	0.352	-0.050	0.006
Third	0.096	0.295	0.091	0.288	0.113	0.317	-0.022	0.201
Fourth	0.098	0.297	0.096	0.295	0.103	0.304	-0.007	0.693
Fifth	0.106	0.308	0.107	0.309	0.103	0.304	0.004	0.833
Sixth	0.098	0.297	0.092	0.289	0.116	0.320	-0.024	0.169

Seventh	0.099	0.299	0.103	0.303	0.087	0.283	0.015	0.384
Eighth	0.108	0.310	0.116	0.320	0.082	0.275	0.033	0.065
Nineth	0.094	0.292	0.104	0.306	0.062	0.241	0.042	0.012
Tenth	0.097	0.296	0.104	0.306	0.075	0.263	0.030	0.086
Demographics								
Female	0.530	0.499	0.572	0.495	0.398	0.490	0.174	0.000
Age 18-30	0.163	0.370	0.153	0.360	0.195	0.397	-0.042	0.049
Age 31-45	0.268	0.443	0.245	0.430	0.339	0.474	-0.094	0.000
Age 46-60	0.280	0.449	0.277	0.448	0.288	0.453	-0.010	0.689
Age 61+	0.289	0.454	0.325	0.468	0.177	0.382	0.147	0.000
Pensioner	0.274	0.446	0.309	0.462	0.162	0.369	0.147	0.000
Currently working	0.778	0.416	0.766	0.423	0.812	0.391	-0.046	0.058
Experience migration	0.135	0.342	0.129	0.335	0.157	0.364	-0.028	0.156
Education								
Secondary	0.196	0.397	0.201	0.401	0.180	0.385	0.021	0.362
Vocational	0.182	0.386	0.176	0.381	0.201	0.401	-0.025	0.270
High School	0.295	0.456	0.277	0.448	0.352	0.478	-0.076	0.004
Vocational high school	0.070	0.255	0.072	0.258	0.064	0.246	0.007	0.621
University	0.099	0.299	0.105	0.307	0.080	0.271	0.025	0.146
Occupation								
White collar	0.142	0.349	0.141	0.348	0.144	0.352	-0.003	0.875
Technical staff	0.029	0.168	0.030	0.171	0.026	0.158	0.004	0.653
Services	0.052	0.222	0.047	0.212	0.067	0.250	-0.020	0.128
Agriculture	0.142	0.349	0.144	0.351	0.134	0.341	0.010	0.610
Blue collar	0.355	0.479	0.348	0.477	0.378	0.485	-0.030	0.287
Others	0.058	0.234	0.056	0.230	0.064	0.246	-0.008	0.551
Big town (above 200 000 inhabitants)	0.235	0.424	0.259	0.438	0.159	0.367	0.099	0.000

Source: Barometer of Public Opinion (2005). Own elaboration.

1/ Tests on the equality of proportions.



We observe from *Table 2*, that 41% of the people who used the health care system paid *atenție*. Around 32% of people who used the health care system know a health care system worker among friends or acquaintances they can rely on, compared to 21% among those who did not use the health care system. Both users and non-users of the health care system perceive the system as corrupted. Around 57% think doctors are corrupt to a high degree or almost all are corrupt.

Non-users of the health care system score better in subjective health. Around 69% are satisfied with their health compared to 43% of users of the system. Users of the health care system are more afraid of diseases compared to non-users (38% compared to 23%, respectively). Among users, there are more retired people (30%) than in the non-users (16%).

The average of household income per capita seems higher for users of the health care system compared to non-users. The proportions of individuals in the highest income deciles among users of the health care system are greater than those in the nonusers' sample. Concerning the own perception that the income is not adequate to fulfil the basic needs, is quite similar between the two groups around 38%. There are more women among the users than among the non-users (57% against 39%, respectively). The average age of the users is around 51 years, compared to 45 years non-users. Regarding the distribution concerning residential area, we observe that 26% of the health care users live in big cities, while only 16% of the nonusers live in big cities.

## RESULTS OF THE MODEL

The estimation of Eq. 5 is presented in *Table 3*. We present the results of three alternative specifications of the probability of making an informal payment in the Romanian health care system. First, column [A] presents our preferred specification: binary response probit maximum-likelihood estimation with sample selection correction. We estimate the coefficients and the average marginal effects of the control variables.<sup>15</sup> The second, column [B] presents the binary response maximum-likelihood estimation with sample selection correction. Finally, column [C] presents the Heckman two-step estimator, in this case a linear probability model.

Table 3. Probability of making an informal payment corrected for sample selection

Variables <sup>a</sup>	MLE Probit SSC [A]		MLE-SSC [B]	OLS-SSC <sup>b</sup> [C]
	Coefficients	AME		
<i>Corruption</i>				
Perception corrupted HCS	0.583***	0.215***	0.222***	0.222***
	[0.080]	[0.027]	[0.027]	[0.028]
Social capital	0.233**	0.086***	0.090**	0.089**
	[0.082]	[0.03]	[0.031]	[0.031]
Income Perception				
Not enough	0.097	0.036	0.032	0.035
	[0.084]	[0.031]	[0.031]	[0.032]
Income Deciles				
Second	-0.154	-0.057	-0.057	-0.052
	[0.172]	[0.063]	[0.063]	[0.064]
Third	-0.068	-0.025	-0.019	-0.020
	[0.170]	[0.063]	[0.065]	[0.064]
Fourth	0.166	0.061	0.069	0.067
	[0.177]	[0.065]	[0.068]	[0.066]
Fifth	-0.197	-0.073	-0.066	-0.070
	[0.165]	[0.061]	[0.063]	[0.062]
Sixth	-0.112	-0.041	-0.037	-0.037
	[0.179]	[0.066]	[0.068]	[0.067]
Seventh	0.094	0.035	0.045	0.042
	[0.172]	[0.063]	[0.066]	[0.064]
Eighth	-0.052	-0.019	-0.014	-0.017
	[0.169]	[0.062]	[0.064]	[0.063]
Ninth	-0.033	-0.012	-0.002	-0.007
	[0.181]	[0.067]	[0.068]	[0.067]
Tenth	0.047	0.017	0.020	0.018
	[0.173]	[0.064]	[0.066]	[0.065]

*STUDII*

<i>Demographics</i>				
Female	-0.036	-0.013	0.001	-0.011
	[0.095]	[0.035]	[0.031]	[0.035]
Age 18-30	0.400**	0.147***	0.134*	0.147**
	[0.144]	[0.053]	[0.053]	[0.056]
Age 31-45	0.256	0.094*	0.080	0.093
	[0.137]	[0.051]	[0.049]	[0.053]
Age 46-60	0.104	0.038	0.029	0.037
	[0.113]	[0.042]	[0.040]	[0.043]
Currently working	0.063	0.023	0.020	0.024
	[0.171]	[0.063]	[0.062]	[0.066]
Experience migration	0.251*	0.092**	0.095*	0.098*
	[0.106]	[0.039]	[0.041]	[0.041]
<i>Education</i>				
Secondary	0.026	0.010	0.013	0.010
	[0.126]	[0.046]	[0.047]	[0.048]
Vocational	0.013	0.005	0.011	0.007
	[0.150]	[0.055]	[0.055]	[0.057]
High School	0.009	0.003	0.004	0.004
	[0.141]	[0.052]	[0.052]	[0.053]
Vocational high school	-0.571**	-0.210**	-0.195**	-0.200**
	[0.203]	[0.074]	[0.068]	[0.075]
University	0.132	0.049	0.059	0.050
	[0.215]	[0.079]	[0.078]	[0.079]
<i>Occupation</i>				
White collar	-0.091	-0.033	-0.040	-0.037
	[0.194]	[0.071]	[0.070]	[0.074]
Technical staff	0.253	0.093	0.092	0.088
	[0.270]	[0.099]	[0.097]	[0.101]
Services	0.135	0.050	0.042	0.047
	[0.226]	[0.083]	[0.085]	[0.087]

Agriculture	0.168	0.062	0.067	0.063
	[0.189]	[0.07]	[0.069]	[0.073]
Blue collar	0.185	0.068	0.071	0.068
	[0.168]	[0.062]	[0.061]	[0.065]
Big town	-0.040	-0.015	-0.004	-0.012
	[0.097]	[0.036]	[0.034]	[0.037]
Constant	-0.756**		0.184*	0.209*
	[0.239]		[0.075]	[0.081]
N	1,229			
Sample Average Prediction	0.482		0.457	0.481
Std. Err.	0.039		0.025	0.042
Wald chi2(29) <sup>c</sup>	118.26		145.8	120.28
AIC	3262.6		3346.3	
BIC	3591.3		3680.4	
$\rho$ . [Correlation error eqns]	-0.485		-0.247	-0.37079
Std. Err.	0.240		0.100	
Wald test of indep. eqns. ( $\rho = 0$ ) chi2(1) <sup>d</sup>	2.85		5.56	Mills' ratio=-.18
[p-value]	0.0912		0.0184	0.079

Source: Barometer of Public Opinion (2005). Own elaboration.

Notes:

SSC: sample selection correction

MLE: maximum likelihood estimation

OLS: ordinal least squares

<sup>a</sup> Reference categories are: *unhappy with own health, not afraid of anything; man, aged 61+, inactive and unemployed, not experiencing migration, primary education; other occupation, small towns and villages.*

<sup>b</sup> *We use heckprob command in STATA software to produce the first two columns, and heckman command in STATA software to produce the last two columns.*

*Standard errors are provided in brackets.*

<sup>c</sup> *It is a Wald test that all coefficients in the regression model (except the constant) are 0.*

<sup>d</sup> *It is a Wald test equivalent for  $\rho = 0$  and is computationally the comparison of the joint likelihood of an independent probit model for the selection equation and a regression model on the observed data of making an informal payment probit model.*

*Legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$*

We observe that the results are quite stable across the three specifications. Coefficients are very similar.<sup>16</sup> In the specifications involving maximum-likelihood estimation, [A] and [B], the sample selection correction proved to be effective. In both cases, the null hypothesis of no correlation of the error terms of the selection and outcome equation was rejected ( $\rho = \text{Corr}(u_i, v_i) \neq 0$ ). In the Heckman two-

step specification, column [C], the hypothesis of independence of the error terms of the selection and outcome equation can be tested directly by using the coefficient of the so-called Mills' ratio. In this case, it is significantly different from zero at any  $p$ -value higher than 0.079.

Our preference for the column [A] specification is because it takes into account the binary nature of the dependent variable (making an informal payment). The structural/outcome equation assumes a probit specification. In consequence, the estimated predicted values of the dependent variable, probability of making an informal payment, is bound between zero and one. That is not necessarily the case in the specification [C]. Nevertheless, the three specifications have similar sample average predictions, very close to the 41% sample value. The differences between specification [A] and [B] are minimal, but specification [A] minimizes both the Akaike information criterion (AIC) and the Bayesian information criterion (BIC).

The perception of health care providers as corrupt and making informal payments are positively correlated. However, it is not clear whether people who paid bribes perceive more the system as corrupt or the perception of the system as corrupt drives individuals to make informal payments.

In regard to social capital, individuals who have relationships with health care providers are more likely to make informal payments. Thus, the hypothesis of informal payments as a form of social insurance against future health needs is validated.

We find no evidence of income, whether subjectively, via the perception variable, or in any deciles influencing the probability of making an informal payment. The likelihood of making an informal payment is not correlated with income deciles. This finding is more evident in the analysis of *Figure 1*. No variability is observed regarding the probability of making an informal payment across income deciles.

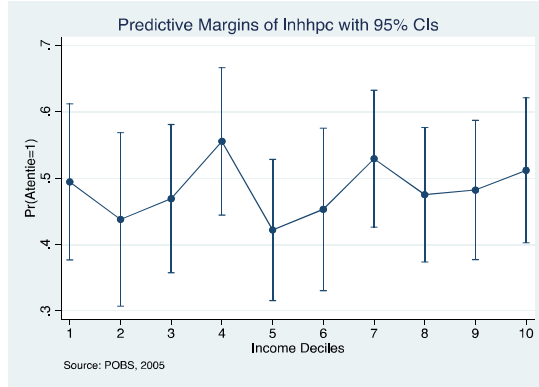


Figure 3. Predictive margins of the income deciles

We cannot infer about the communist legacy. Should the communist past influence informal payments, one would expect that older cohorts of the population would be more likely to make an informal payment. According to our results, younger cohorts are more likely to make informal payments. *Figure 2* allows us to observe that the probability of making an informal payment decreases with age.

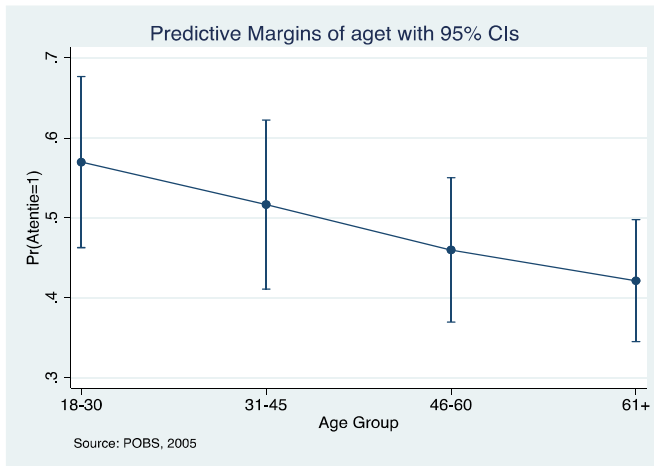


Figure 4. Predictive margins of age

Individuals who have migration experience are more likely to make an informal payment. In 2005, migrants in the EU of Romanian origin were mostly circulatory migrants because the country was an accession country to the EU, and most migrant continue to be circulatory migrants as their permanent residence remains in Romania but they commute for work in the EU. It could be that because their main job is abroad they are not insured with the Romanian health care system, meaning they could only receive health care in case of emergency and thus they could be more prone to make an informal payment.

People with vocational studies and high-school education are less likely to make informal payments controlling for all the other variables.

We cannot infer any effects of working status or living in a big town on the likelihood of making an informal payment in the health care system. We could not relate these results with those of Lewis (2007) who find that in rural areas, where the health providers are not many, the patients have higher chances to pay *atenție* because of the monopolistic behaviour of providers.

Table 4 reports the coefficients of the three different estimations discussed earlier: the binary response probit maximum-likelihood estimation with sample selection correction [A], the binary response maximum-likelihood estimation with sample selection correction [B], and the Heckman two-step estimator [C]. The results in the three specifications are very similar since they are based on a probit estimation.

Table 4. Selection equation probability of going to the doctor

	MLE Probit SSC	MLE-SSC	OLS-SSC
Health perception			
Happy own health	-0.564***	-0.574***	-0.574***
	[0.083]	[0.080]	[0.081]
Afraid diseases	0.327***	0.325***	0.311***
	[0.079]	[0.081]	[0.082]
Income Perception			
Not enough	-0.180*	-0.184*	-0.188*
	[0.083]	[0.083]	[0.084]
Income Deciles			
Second	-0.197	-0.205	-0.218
	[0.155]	[0.155]	[0.153]
Third	0.087	0.084	0.076
	[0.159]	[0.159]	[0.159]
Fourth	0.057	0.052	0.043
	[0.168]	[0.168]	[0.166]

Fifth	0.149	0.144	0.135
	[0.155]	[0.155]	[0.157]
Sixth	-0.009	-0.013	-0.021
	[0.164]	[0.164]	[0.165]
Seventh	0.104	0.103	0.099
	[0.162]	[0.163]	[0.165]
Eighth	0.075	0.076	0.078
	[0.163]	[0.164]	[0.167]
Ninth	0.226	0.227	0.227
	[0.181]	[0.182]	[0.182]
Tenth	0.05	0.048	0.039
	[0.168]	[0.169]	[0.173]
Demographics			
Female	0.410***	0.407***	0.404***
	[0.077]	[0.077]	[0.078]
Age 18-30	-0.266	-0.262	-0.264
	[0.145]	[0.146]	[0.140]
Age 31-45	-0.353**	-0.352**	-0.358**
	[0.131]	[0.132]	[0.130]
Age 46-60	-0.310**	-0.308**	-0.306**
	[0.114]	[0.114]	[0.115]
Currently working	-0.15	-0.152	-0.154
	[0.169]	[0.169]	[0.169]
Experience migration	-0.112	-0.113	-0.117
	[0.103]	[0.103]	[0.104]
Education			
Secondary	0.163	0.162	0.156
	[0.135]	[0.136]	[0.134]
Vocational	0.251	0.251	0.246
	[0.152]	[0.152]	[0.154]
High School	0.124	0.125	0.124
	[0.144]	[0.144]	[0.145]
Vocational high school	0.372	0.369	0.366
	[0.199]	[0.199]	[0.203]



University	0.532*	0.533*	0.529*
	[0.209]	[0.209]	[0.215]
Occupation			
White collar	-0.158	-0.155	-0.149
	[0.185]	[0.185]	[0.189]
Technical staff	0.061	0.06	0.056
	[0.263]	[0.262]	[0.273]
Services	-0.25	-0.254	-0.259
	[0.211]	[0.210]	[0.212]
Agriculture	0.09	0.096	0.104
	[0.183]	[0.183]	[0.181]
Blue collar	0.067	0.069	0.072
	[0.163]	[0.163]	[0.161]
Big town	0.362***	0.363***	0.362***
	[0.096]	[0.096]	[0.096]
Constant	0.837***	0.847***	0.866***
	[0.185]	[0.186]	[0.189]
Sample size	1,618		

<sup>a</sup> Reference categories are: unhappy with own health, not afraid of anything; man, aged 61+, inactive and unemployed, not experiencing migration, primary education; other occupation, small towns and villages.

Standard errors are provided in brackets.

Legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

According to the results reported in Table 4, the probability to use the health care system is lower for those individuals who are satisfied with their health status. Health care utilization is higher among those who are afraid of getting sick, compared to those who are not afraid of anything. Therefore, self-perception of health status and fears play an important role in health care utilization.

Perception of not enough income decreases significantly the probability of making an informal payment. Controlling for other variables, individuals who perceive their income is not enough for the basic necessities are less likely to go to the doctor. This finding could confirm that poor people might have access problems. Nevertheless, none of the coefficients of the variables indicating income deciles is statistically significant.

Women are more likely to use the health care system than men are. This result is consistent with previous findings that showed that women are more likely to go to the doctor for non-threatening injuries or diseases. With regard to age, the so-called J curve<sup>17</sup> is confirmed. Younger cohorts are less likely to use the health care system with respect to older cohorts.

We find no evidence of working, occupation or migration experience affecting the likelihood of going to the doctor.

University graduates, and people that are more educated, are more likely to use health care. People living in a big city of more than 200000 inhabitants are more likely to go to the doctor compared to individuals living in villages or small towns. This is an indication that our proxy for health care supply is performing well, as small towns are likely to lack proper and advanced hospitals.

## CONCLUSIONS

Suggesting policies to improve the current situation of the Romanian Health Care System (under-funding), must take into account that corruption is part of the public services in Romania. As our analysis has shown, making informal payments is seen as a way to ensure the access to public health care.

The payment of *atenții* is widespread, to the extent that more than 40% of the population older than 18 years old has been involved in informal payments to receive medical attention. Additionally, based on figures from Lewis (2002) and the World Health Organization (WHO) data set, Romanians spend around 450 mills US PPP\$ in *atenții*. This creates inequities and inefficiencies in the distribution of health care.

The phenomenon of informal payments in health care systems can be studied from many angles. In this study, we have discussed three perspectives. First, we discussed an economic approach emphasising the role of incentives and market failures (Ensor, 2004); as well as the role of government failures (Balanova and McKee, 2002). Second, we mentioned a sociological approach emphasising the roles of institutions and the culture of gratitude payments placing the phenomenon into a context of informal economies (Kornai, 2000). The role of the communist past is the main reason generating a second parallel economy in which fostering relationships with providers of goods and services is the key to access scarce resources (Ledeneva, 1998). Third, a political science approach emphasizes the lack of accountability and control (Lewis, 2002, 2007) as well as the lack of government legitimacy (Rose-Ackerman, 2001).

As we have shown, the Romanian health care system's evolution generates incentives and creates room for informal payments. Informal out-of-pocket payments maintain the Romanian Health Care System functional in the context of under-funded budgets and scarce resources.

A binary response maximum-likelihood probit model with sample selection correction was estimated. The outcome regression calculated the likelihood of paying an *atenție* based on demographic and labour related variables (including income) and the perception of corruption and social capital.

The model illustrates that the perception of health care providers as corrupt and making informal payments are positively correlated. However, it remains unclear if people who made informal payments perceive more the system as corrupt or the perception of the system as corrupt drives individuals to make informal payments. This could be a source of potential endogeneity. Regarding social capital, individuals who have relationships with health care providers are more likely to make informal payments. Thus, our hypothesis of informal payments as a form of social insurance against future health needs is validated. Moreover, we cannot infer about the communist legacy discussed in the context of the sociological perspective. Should the communist past influence informal payments, one would expect that older cohorts of the population would be more likely to make an informal payment. According to our results, younger cohorts are more likely to make informal payments. Figure 2 allows us to observe that the probability of making an informal payment decreases with age. The analysis also showed that controlling for income, and the perception of having inadequate income to cover basic needs does not play a role in making an informal payment.

The selection equation assessed the probability of going to the doctor based on the self-perception of health and personal fears as exclusion restrictions. It found that people who evaluate positively their state of health are less likely to use the system. The results indicated that people who are afraid of getting sick, women are more likely to go to the doctor. With regards to age, the so-called J curve<sup>18</sup> is confirmed. Younger cohorts are less likely to use the health care system with respect to older cohorts. Controlling for income, people who perceive their income is not enough to satisfy their basic needs are less likely to go to the doctor, indicating that health care needs are not met for the poor. This finding could confirm that poor people might have access problems. Nevertheless, none of the coefficients of the variables indicating income deciles is statistically significant. We find no evidence of working, occupation or migration experience affecting the likelihood of going to the doctor.

University graduates and people that are more educated are more likely to use health care. People living in a big city of more than 200,000 inhabitants are more likely to go to the doctor compared to individuals living in villages or small towns. This is an indication that our proxy for health care supply is performing well, as small town are likely to lack proper and advanced hospitals.

Our analysis reveals the fact that generating trust among Romanians as well as increasing health funding could decrease informal payments. Accountability of the medical service could decrease the need for *atenție* accompanied by good wages and premiums for performance complemented by a well funding system of

hospitals and ambulatory care. However, this investment has to be complemented by mass media campaigns providing information regarding the rights of the patients.

As we could see from the empirical analysis this could have an impact in reducing the payment of *atenție*, and reducing the need of having contacts in the system. The increase of professionals, especially in rural areas, could decrease the needs for paying an *atenție* to get a service in those circumstances. Reforms are needed to improve the health indicators of the country and help to generate solid foundations to build sustainable economic growth with a healthier and productive population.

### Notes

<sup>1</sup> The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Peruvian Ministry of Economy and Finance.

<sup>2</sup> Previous studies have distinguished conceptually between gratitude payments, which are voluntary, and envelope payments that are required by the staff. Moreover, it could be argued that gratitude payments are a form of insurance against future care needs (Lewis, 2007). In this paper that distinction, whether voluntary or required, is not made as it is difficult to assess the nature of the transaction. Therefore, terms like informal payments, gratitude payments will be used interchangeably in this paper.

<sup>3</sup> Data is available from <https://www.gesis.org/index.php?id=11248>.

<sup>4</sup> Formal payments are legal fees paid for the health care costs.

<sup>5</sup> In microeconomics, economics of health, health care appears as a derived demand from the demand of health and is an input in the production function of health. The standard model to derive health care demand assumes that the individual can choose between consuming a generic good and increasing his/her health status in order to maximize utility. Grossman (1999) suggests a model in which the basic model takes a step further and medical care is seen as an investment good. The basic assumption is that individuals invest in human capital to improve outcomes in both market and non-market sectors and maximize their outcome in healthy days. Most of the microeconomics circumvents the problem of investigating directly health care by making assumptions about the health preferences and assuming that health is a normal good.

<sup>6</sup> The central planning bureau set the prices for medical services; therefore, supply and demand had little impact on doctors' wages that were in a position to increase their standard of living through gratitude payments (Kornai, 2000).

<sup>7</sup> Even though the Law was passed in 1997, the enforcement of the legislation was done in 1999 when the local branches of the National House for Health Insurance became autonomous public institutions.

<sup>8</sup> Capitation is the system of payment for each customer served (list), rather than by service performed.

<sup>9</sup> From this, 70% of the total budget is allocated based on historical basis and 30% on performance criteria, such as average length of stay, number of impatiens, etc. European Observatory of Health Care Systems (2000).

<sup>10</sup> If we allowed all variables in the selection equation to also appear in the structural equation, the parameter estimates become very imprecise. (Wooldridge, 2002).

<sup>11</sup> Exclusion restriction is required otherwise parameter identification would be off of the nonlinearities in the probit model (Wooldridge, 2002, 814).

<sup>12</sup> Data can be obtained from the SOROS Foundation, or alternatively from the Center for public innovation [scie@inovarepublica.ro](mailto:scie@inovarepublica.ro).

<sup>13</sup> Data also include other questions regarding whether people who used other public services like police, judicial court system, city hall, public servants have paid bribes to solve their problem.

<sup>14</sup> Data includes information about consumption expenditure in the last month, but we have chosen income.

<sup>15</sup> The average marginal effect summarizes the response of individuals in their probability to make an informal payment in the sample to a change in the value of a control variable. It represents the mean of the marginal effects for all individuals in the sample. For interpretation see Williams, R., (2012), "Using the margins command to estimate and interpret adjusted predictions and marginal effects", the STATA Journal, 12(2), pp. 308-331.

<sup>16</sup> In the case of specification [A], the average marginal effect is comparable to the coefficients of the other specifications.

<sup>17</sup> The J curve is used to explain the consumption of health with respect to age. It is assumed that, once an individual is born, he consumes health care; but this consumption decreases when he grows up; to increase again when he is getting old.

<sup>18</sup> The J curve is used to explain the consumption of health with respect to age. It is assumed that, once an individual is born, he consumes health care; but this consumption decreases when he grows up; to increase again when he is getting old.

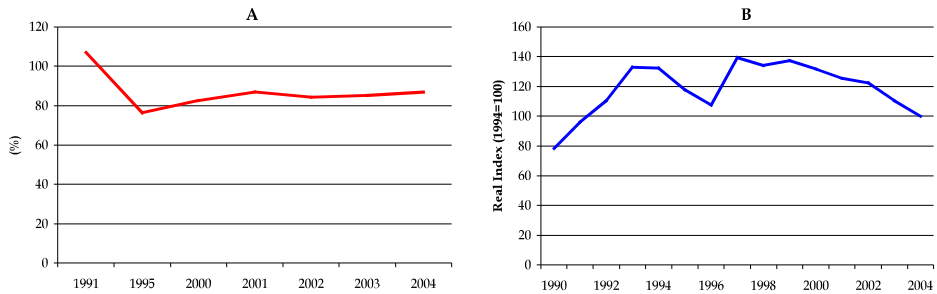
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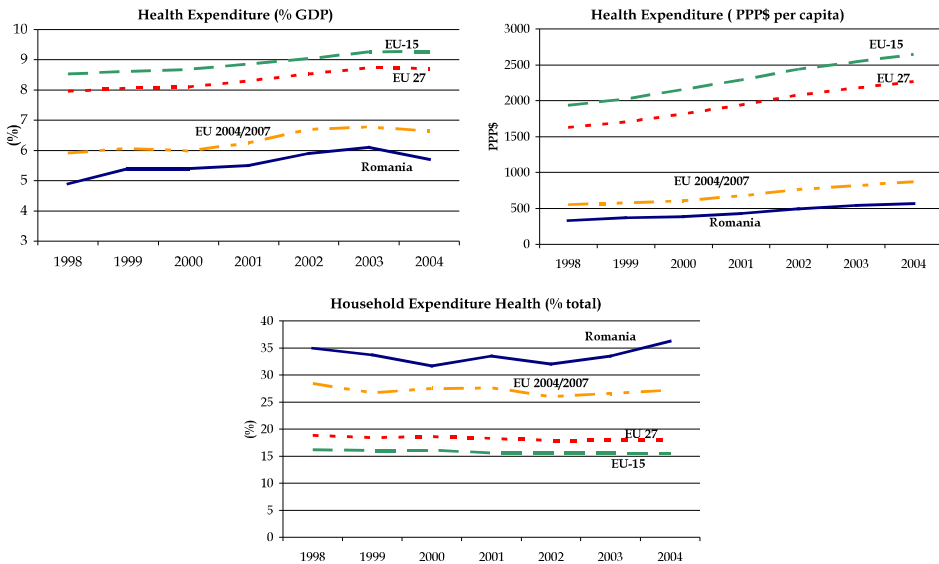
## ANNEX



Source: Romanian National Institute of Statistics. Own elaboration.

Figure 1: Wage in the health sector as a proportion of the average total wages (A). Index real earnings (1994=100) Total economy (B). Romania (1990-2004).





Source: European health for all database (HFA-DB) - World Health Organization Regional Office for Europe. Own Elaboration.

*Notes:*

1 EU 2004/2007 includes the 12 new Member States of the European Union from 1 May 2004 or 1 January 2007 (without Romania). EU-27 includes the 27 Member States of the European Union (without Romania). And, EU-15 comprises Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden and the United Kingdom.

2 Household expenditure health represents the share of out-of-pocket payments out of the total health expenditures. Out-of-pocket payments on health are the direct outlays of households, including gratuities and payments in-kind.

Figure 2. Romania and EU (1998-2004). Selected Health Financing Indicators

Table 1. Variables explanation

Variables	Explanation
Informal payment health care	Binary : 1 if informal payment
<i>Corruption</i>	
Perception health care system	Binary 1 if perceived as corrupt
<i>Social capital</i>	Binary: 1 if have friends in health sector
<i>Health perception</i>	
Happy own health	Binary: 1 if happy with own health
Afraid diseases	Binary
Afraid other things	Binary
<i>Demographics</i>	
Female	Binary
Age 18-30	Binary
Age 31-45	Binary
Age 46-60	Binary
Age 61+	Binary
Currently working	Binary
<i>Income deciles</i>	
First	Binary
Second	Binary
Third	Binary
Fourth	Binary
Fifth	Binary
Sixth	Binary
Seventh	Binary
Eighth	Binary
Nineth	Binary
Tenth	Binary
Perception that the current income is not enough for the basic necessities	Binary
<i>Education</i>	
Secondary	Binary
Vocational	Binary

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High School	Binary
Vocational high school	Binary
University	Binary includes college, university and graduate studies
Experience migration	Binary includes own experience migration or family member abroad
<i>Occupation</i>	
Blue collar worker	Binary
White collar worker	Binary
Technical staff	Binary
Other	Binary
Services	Binary
Agriculture	Binary
<i>Residential area size</i>	
Big town above 200,000 people	Binary

*Source: Barometer of Public Opinion (2005). Own elaboration.*