Corruption in Health Sector:
Evidence from Unofficial Consultation fees in Bangladesh

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Abstract

This paper studies the incidence and extent of 'extortion' payment made to the doctors in public health facilities using nationally representative Household Income Expenditure Survey (HIES) of Bangladesh. Though consultation fees are free in public health facilities, HIES shows that a large number of patients visiting public health facilities have paid positive fees which can be considered as an extortion payment. A key advantage of using HIES is that it is free from any reporting bias which otherwise occurs in surveys designed only for studying corruption. We focus on three set of variables to explain incidence and extent of doctor's extortionary power: relation-specific expenditures of patients (transportation cost and travel time), ability of patients to pay (annual income and total land assets), and market power of doctors in public health facilities (proxied by number of total persons engaged in the major health facilities in a community). We found that all three sets of variables are statistically significant in explaining the incidence of corruption, even though travel variables have a negligible effect on incidence of corruption. Furthermore, travel variables and total persons engaged significantly explain the amount of extortion payments in the form of consultation fee whereas the income and wealth are not robust in explaining extortion payments.

Keywords: Corruption, Public Sector, Public Health, Price Discrimination, Economic Institution, Informal Economy, Publicly provided goods

JEL Classification: D73, I18, L11, O17, H42

I. Introduction

What is the extent of corruption in public sectors and who pays how much of it remain important questions for policy makers in rich and poor countries (World Bank – Making Services Work for the Poor, WDR 2004). However, until recently, the evidences on the incidence and magnitude of corruption were based on cross-country, perception based indices, the shortcomings of which have been discussed in Svensson (2003). It is only in recent years that a nascent literature that quantifies corruption using micro level data has been emerging. Measuring leakages of public expenditure allocation, explaining the efficiency of public service providers, and the characteristics of recipient of the public services - household and firm which explain the incidence and extent of corruption have been the central issues of this new literature[1]. In this paper on health sector corruption of Bangladesh, we extend this nascent literature by measuring the extent and determinants of corruption in public health services by the use of micro level data.

In Bangladesh, like many other developing countries, most of the basic public health services including consultation with doctors at public facilities are free. However, charging fees for such service is very widespread (Transparency International, 2006)[2]. For instance, in Bangladesh about 44% patients who visited public health facilities had to pay positive consultation fee to the doctors in 2005 with mean payment of 44 taka and standard deviation of 103 taka[3]. Thus, questions arise – i) who pays this 'fees' and who don't, and ii) why some patients are paying more than others?

This study, using nationally representative Household Income and Expenditure Survey (HIES) of 2005 for Bangladesh address these two questions. 2005 HIES collected

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[1] see Reinikka and Svensson, 2003 for detail

[2] The Transparency International (TI) made health sector as their main theme for their Global Corruption Report in 2006 where a whole section was devoted to informal payments. The report, for example, reveals that 84% of total health expenditure can be attributed to informal payments whereas it constitutes half of total out-of-pocket expenditure in Georgia, the major component (70% – 80%) in health expenditure. Similar practices exist in countries like Russian Federation, Poland, Tajikistan and Albania. The report also presented evidence this kind of payment is also quite prevalent in countries like Slovakia, Latvia, Bulgaria and Romania.

[3] Calculated from 2005 HIES.

detailed information on expenditures on different goods and services including health. The section on health related expenditure include the amount of money spent for doctor consultation, other related fees and information on whether the patient visited public or private doctors allow us to identify unofficial payments made to the doctors which is free from any reporting bias. In this study we explain the factors that determine the incidence and the extent of these unofficial 'fees' made in public health facilities.

This paper is related to the recent growing applied microeconomic literature on unofficial payments. Svensson (2003) first analyzed these types of payments on cross section of firms in Uganda where he showed that firms on which public officials has more control (measured by indices developed by the author) has a higher probability to pay whereas firms with a higher ability to pay (proxied by current and future profitability) and lower refusal power (proxied by estimated alternative return on capital) had to pay more due to weaker bargaining power. Similarly, Hunt (2007) analyzed unofficial payments in health care sector in Peru and Uganda and found that richer patients are more likely to pay bribes as well as pay more. Both Svenson (2003) and Hunt (2007) use data set that contains quantitative information on bribe payments, where respondents were asked how much they had to pay to get access to services (customs, licenses, electricity, telephone etc in Svenson's case and healthcare in Hunt's case). However, direct reporting on bribes can lead to under or over reporting depending on the bribe-giver's outcomes, which our data is free from.[4] In addition, Svenson (2003) has a large number of missing bribery data (27.5%) where firms refused to report on bribes paid which raises the issue of selection bias.

Other relevant studies for the current purpose are Banerjee, Deaton and Duflo (2004), Bertrand et al (2006), and Olken and Barron (2007). Based on survey data collected from one district in rural Rajasthan in India, Banerjee, Deaton and Duflo (2004), who evaluate the impact of access to health care on well being, also report incidences of informal payments in public health facilities. Bertrand et al (2006) in the context of obtaining

[4] In discussing about the need of micro data regarding corruption, Bertrand et al (2006, p.29) mention that "Had we ran a survey simply asking individuals who had obtained a license whether they paid bribes, we have had concluded that there was no corruption in the bureaucratic system."

driving license in New Delhi in India have focused on regulations and bureaucratic corruption and found that the bureaucrats respond to private needs; they (bureaucrats) however ignore socially important components of regulatory objectives. Olken and Barron (2007) using a survey in combination of a natural experiment have examined how the extent of corruption changes with a change in market structure and found that the market structure has an impact on the total amount of bribes charged. In addition, their findings also support the standard hold up theory.

It is found that land ownership significantly explains the incidence and extent of corruption- persons who own more land are more likely to pay and they pay more unofficial payments. Interestingly, annual income does not have any significant impact in either case. It case of rural areas this result could make senses where land is a good proxy for income. But people from urban areas make up more than half of the sample (52 percent) who go to public hospitals as against 38 percent for the whole sample of HIES. Furthermore, HIES does not collect annual income explicitly; it rather has to be computed from the information on economic activities and employments. Given also that these information depend on long recall period and information on self employment income, the computed annual income is a weak measure for actual annual income.

Higher transportation cost and travel time have found to increase the unofficial payment. However these travel variables do not explain incidence of corruption significantly. The positive effect of travel variables in explaining higher unofficial fees lends support for Hold-Up problem (Grossman and Hart, (1986). Olken and Barron (2007) also analyzed extortion payments in hold up context, but our use of travel-related variables as non-contractible relation-specific investments is novel.

The fact that the travel variables do not explain incidence of corruption may shed some light on the process corruption takes place. Anecdotal evidence suggests that a patient at some point before consultation is asked whether the patient would choose the free but short treatment or rather prefer a detailed treatment which is available for a fee.[5] Once a

[5] See, for example, Social Sector Performance Survey – Health and Family Planning (2007).

patient agrees to pay, the payment then is decided based on bargaining with the doctor or staff. According to this anecdotal evidence, travel variables should play an important role in deciding the amount of consultation fee above zero, but not the type of service and therefore, whether to pay.

Reduction of doctors' market power, as captured by higher number of staffs in public health hospitals, is found to reduce the incidence as well as amount of unofficial payment. Greater number of doctors and staff enhances competition and collusion becomes harder which reduces unofficial payment and the incidence of corruption.

The major contribution of our paper comes from application of hold up theories using travel-related variables in analyzing bribe payments. Olken and Barron (2007) also analyzed bribe payments in hold up context, but our use of travel-related variables as non-contractible relation-specific investments is novel. Furthermore, our inclusion of total persons engaged allows us to examine an important proposition made by Wilson (1989): a greater number of service windows in a facility should reduce illegal payments.

We also have used a nationally representative, household survey which is only done by Hunt (2007). In addition, we believe our measure of unofficial payments is more reliable. The household surveys on corruption that collect information on this type of payments often run the risk of collecting biased information since they ask the amount of bribe or unofficial payment made, a highly sensitive question. The 2005 HIES simply asked the amount of consultation fee paid whereas the type of facility where it is paid (in our case, public health facility) is asked elsewhere. We combine these two information to identify who actually made such payments in public facilities and since no reference to bribe, illegal or unofficial payment is made, we believe this would create minimal bias.

The rest of the paper is organized as follows. The section II briefly discusses the conceptual framework for the factors determining the bargaining process. Section III sets up the institutional background and section IV presents the data. Section V analyzes the incidence of corruption while section VI focuses on the extent of corruption. Section VII compares results using HIES 2005 data with results using HIES 2000. Section VIII draws conclusion.

II. Determinants of Incidence and Extent of 'unofficial' Payments: A Conceptual Note

The outcome of bargaining between the doctors and patients over unofficial consultation fees depends on a host of factors. Income and wealth of the patients increase the willingness and ability to pay for extortion[6]. Hence, it is possible that the public doctors and staffs may price-discriminate based on income and wealth of the patient. Though the doctors don't have the income or wealth information at the beginning, this information may be revealed through appearance and conversation. On the other hand, if income and education is correlated, doctors may not ask for unofficial fee from an educated well-off person who can be socially well connected. Moreover, in rural areas land rich persons are influential and may not be charged any fees because the local doctors want to maintain good relationship with them. Therefore, income and wealth effect on the incidence and extent of unofficial payments made to the doctors are not very obvious.

Every patient needs to make a certain amount of effort in order to reach the health facility for the treatment. In the event a fee is charged for the service, a patient may disagree to do so since it is illegal. However, disagreeing to pay may also cost the patient by not getting the service. In that event, the patient not only loses the service but the effort made to reach the facility also becomes sunk. Furthermore, this cost is higher if the effort made is higher. Hence, the patient with greater effort will have a lower bargaining power and may end up paying more. This is the standard 'hold up' problem as proposed by Grossman and Hart (1986). However, in the presence of very limited health facilities in remote rural areas, a patient may not have any option but to visit the public health facility for treatment. One can expect that a greater effort to reach public facility can be associated with a higher consultation fee. Transportation cost and travel time are good proxy for the effort made to reach the hospital. Whereas transportation cost reflect the

[6] See for example, Svensson (2003) and Hunt (2007). Bertrand et al. (2006) also has similar results.

monetary cost, the travel time works as a proxy for opportunity cost to visit the health facility as well as a proxy for physical effort costs for patients.

On the other hand, patient may consider efforts to reach health facility and consultation fees as substitutes. Households may have a fixed budget for visiting doctors and a greater fraction spent on travel may induce them to spend less on consultation with doctors. Therefore, standard ‘hold up’ argument may not hold in equilibrium.

Severity of diseases and the extent of urgency can also affect patients’ bargaining power. In case of emergency which requires immediate attention of the doctors, patients (or her family) may be less reluctant to bargain with doctors. Doctors and patients may develop a relationship in case of chronic diseases which need frequent visits by the patients. In this case doctors may charge low fees, if not zero.

Patients’ age, sex and religion may also play role in the bargaining process. Young, female and minority groups may have lower bargaining power and end up paying doctors more. However, young and female are accompanied by adult and male, which is very likely in developing countries, this argument will not hold.

The bargaining power of the doctors hinges heavily on their market power of their locality which in turn depends on availability of other health facilities, both private and public. Wilson (1989) in his celebrated work suggested that a greater number of service windows limit the ability of bureaucrats to charge extortion since individuals can always switch to a different window if such a charge is made. A larger number of doctors then increases competition among the doctors and makes it harder to collude. Availability of private health care services puts the upper limit on bribes that doctors in public facilities can charge. This therefore can be expected to reduce unofficial payment and the incidence of corruption.

Furthermore, non-doctors staff may also play part in the whole bargaining process. These staffs of the public health facilities play an important role in organizing these payments.

Assuming that these staffs get a share of the payment, a larger number of staffs increase competition among the staffs to serve the doctors. This reduces bargaining power of the staffs and the share paid to the staffs can be expected to be dropped. This lowers the cost of organizing the payment and doctors would charge patients less. Since doctor's consultation is now cheaper at this facility, doctors at other public health facilities can be expected to face a lower demand and may lower their (unofficial) fee too.

III. Institutional Background

Bangladesh is divided, for administrative purposes, into 6 divisions, 64 districts and 508 sub-districts. At a lower level, there are 4466 unions in rural areas and 2300 wards in urban areas. The public health facilities are located based on this administrative layout. All the divisional, district cities and sub-district towns have public hospitals. At a lower level, however, not all the unions have public health facilities.

More specifically, there are only 1362 Union (Health) Sub-Centers (USCs) which mostly provide curative, preventive and family welfare services at the union level. These USCs have four sanctioned posts with one doctor. There are also 17 Rural Health Centers which are 10 bedded and has 20 sanctioned posts with two doctors. Finally, there are 35 20-bedded hospitals located at some unions.

At a higher level, the Sub-District Health Complexes (SHCs) at sub-district towns operate as a hub to the primary health care at the grass root level. There are 153 50-bedded SHCs and 260 31-bedded SHCs with nine sanctioned posts for doctors including junior consultants and surgeons. These health complexes provide the first level referral services to the community.[7]

Beyond the Sub-district, there are District Hospitals located at the District cities that provide second level referral services. These are usually 100 bedded Hospitals, but some (nine) of these are also 250 bedded (these are called General Hospitals). There are greater

[7] Note that the total number of SHCs are less than total number of sub-districts. The reason is that each district head quarter, located in the city, also contains a sub-district and therefore, there is no SHCs in these district head quarters since they already have a Sadar or General Hospital.

number and lines of consultative services provided at these facilities. A few other districts also have public medical college hospitals and specialized hospitals as well. All these health facilities provide secondary as well as tertiary level health care.

At the divisional level, there are no public hospitals as such, but the divisional cities have at least one medical college hospital with some divisional cities even have specialized hospitals (these are chest, leprosy and infection disease hospitals) and institute (research) hospitals. Most of the Medical College Hospitals located at Divisional cities are at least 500 bedded and provide tertiary level health care services. There are also post graduate hospitals, school health clinics and urban dispensaries.

Given the above scenario, it is clear that patients in large cities are more privileged with better public health services than smaller cities and the smaller cities have better services than rural areas. Furthermore, most unions do not have a USC and therefore, the patients in those unions need to travel out of the unions if they wish to travel to a public health facility. In addition, a recent Social Sector Performance Survey on Primary Health and Family Planning Services shows that the staffing norm in SHCs and USCs are much different from actual staffing situation: 68% of USCs do not have a doctor and the mean number of doctors at SHCs is 5.35.[8] This indicates that the patients in rural Bangladesh have very limited public health services.

The sub-districts however are not geographically very large: the average size of a sub-district is 290 square km and commuters from many unions can travel to the Sub-District towns even using slow, non-motorized vehicles. Hence, commuting to Sub-district Health Complexes is not difficult to many patients, but this also implies tremendous pressure on SHCs.

The number of patients at each type of hospitals is given in the table in appendix 1. The average number of patients is greater at larger hospitals (in terms of beds, for example).

[8] See Final Report of Social Performance Survey: Primary Health and Family Planning in Bangladesh (2005).

However, if we consider the total number of patients, then we see that 48.8% of all the patients visiting public hospitals visit Sub-District Health Complexes and 32.5% go to Union Sub-Centers. This indicates that SHCs and USCs play an extremely important role in providing health care to the population.

As far as the health policy is concerned, Government of Bangladesh aims to provide health care services to all through ensuring Essential Service Package (ESP), a package of basic health services, mostly at Sub-District Health Complexes. These services include Reproductive Health Care, Child Health Care, Communicable disease control, Limited curative care, and Behavior Change Communication. A considerable amount of services including consultation with doctors and provision of some essential medicines for provided for free at the public health facilities. The doctors and other staffs are however allowed to work outside the public health facilities at after hours. The doctors, in particular, are even allowed to do medical consultative practices privately outside the health facilities at after hours.

IV. Data

We have used two sets of data in this paper: i. Household Income Expenditure Survey conducted by Bangladesh Bureau of Statistics (BBS) in 2005 and ii. Directory of Health and Social Welfare 2005 published by Bangladesh Bureau of Statistics, Ministry of Planning.

The Household Income Expenditure Survey 2005 (HIES 2005) was done on 10,080 households and 48,969 individuals in 1 mouja (a mouja consists of two/three neighborhoods) per union in 518 unions, 366 sub-districts and 64 districts. The survey collected detailed information on demographics, income and asset, consumption, expenditure, employment, education and health.

In the Health section, the households were asked about type of illness, type of doctors consulted (whether public or non-public), travel time and mode of transport. The survey also collected information on cost of getting the health service by simply asking “What was the cost of treatment during the past 30 days?" under which there are subsections where households need to report the consultation fee, hospital/clinical charges, cost of medicine, cost of test/investigation, transportation cost, tips and other charges. These questions are asked irrespective of whether the patient goes to a private facility or public facility or even traditional or spiritual health professionals.

While asking about what type of professional the individual consulted, the public doctor is defined as the government doctor in the government facility whereas the survey kept option for whether the person consulted is a government doctor practicing in a private facility. This makes it possible to identify a government doctor.

2005 HIES shows that there are 8,573 individuals who were suffered from any illness or injury in past thirty days whereas around 6,314 individuals were suffering from some sort of chronic illness or disability in past twelve months. In total, there were 12,894 individuals who were suffering in chronic or non-chronic disease. However, not all these individuals sought treatment. Besides, the survey asked whether the individual had consulted anyone for the illness/injury only. It turns out that there were about 5,874 individuals who consulted someone for the illness/injury they suffered in past 30 days.

Not all these individuals or patients visit public hospitals. In fact, most patients do not visit public health facilities for consultation. Only 619 individuals, out of 5, 874 patients who suffered in past 30 days seeking treatment visited public health facilities for consultation. However, some patients among these patients also visited other facilities, before or after visiting a public health facility. Dropping these observations left us with 484 observations.

Finally, we also use the Health and Social Welfare Directory 2005 which includes all the health and social welfare organizations that employ more than 10 persons. The directory has the name and address of the facility, total persons engaged, total female persons engaged and year of establishment. The data on Total persons engaged in public

Hospitals beyond Union Health Centers are collected from here. The Union Health Centers were left out of this directory since these centers employ less than 10 persons.

The HIES 2005 data reveals 484 patients went only to public health facility for treatment. Who go to these facilities? Do these patients have any special characteristics? We compare some demographic characteristics of these patients with those patients who sought some form of treatment to any kind of facility. The comparisons are given in table 1. The table reveals that the two groups are mostly the same. The mean annual income for all patients are lower than that of patients going to public heath facilities, but these patients on average are wealthier since they have higher mean acres of land. Furthermore, proportion of all patients living in rural area is larger than that of all patients going to public health facilities.

A patient traveling to a public health facility spends about 57 taka and the trip takes about 38 minutes on average. If only the patients that made a payment are considered, these numbers went up to 85 taka and 45 minutes. Whereas this may indicate that these transport variables may have some explanatory powers of unofficial payments, patients making payments also has higher income and wealth. This could then mean that richer patients (with higher income and land) may choose more expensive and faster transports and pay more often too. Indeed, among the patients who make some kind of payments, a greater proportion choose some form of transportation (therefore, having positive transportation cost and taking greater time) instead of walking.

We use Total Persons Engaged (TPE) in Sub-district Health complexes as an aggregated number of doctors and staffs working in those complexes which we collected from the Health Sector Directory 2005 compiled by Bangladesh Bureau of Statistics (BBS). Given that Sub-District Health Complex (SHC) operates as the local hub to provide the primary health care and indeed, 49% of all patients availing the public health services do so at these health complexes, SHCs indeed play an important role.

Table 2 reveals that the average number of staffs working in a Sub-District Health Complex is around 74, and even more interesting, the standard deviation is 65. This implies we have enough variation in total persons engaged to use it for our analysis.

V. Incidence of Corruption: Who Pays unofficial fee?

To analyze incidence of corruption, we construct a probit model of the following form:

$$Doctor's\ fees = \Phi\left(\alpha + \beta_1 \cdot income\ variables + \beta_2 \cdot TPE + \beta_3 \cdot travel\ variables + \beta_4 \cdot other\ controls + u\right)$$

Where dependent variable equals one when an individual makes a positive payment and equals zero whenever he doesn't make one and Φ (.) follows normal CDF. Income variables include annual income and total land, TPE implies total person engaged in public health facilities, travel variables include travel time and transportation cost and other controls include patients' age, sex, religion and type of diseases.

We first consider income and wealth of the households. The results are given in column 1 and 2 of table 3. We first show these effects separately and then consider them together. It turns out that annual income does not explain the probability of making a payment, but the total land owned does. A one acre increase in total land owned increases probability of payment by 5.8% and this is statistically significant at 1% level.

We next consider disease variables. These include types of diseases, number of diseases the patient is suffering from, whether the patient has a chronic disease and whether the patient is suffering from any 'other' disease. The result is given in column 3 of table 3. There is no change, both in terms of magnitude and statistical significance, to coefficient of annual income. The coefficient of total land owned increases slightly to 6.4% and is statistically significant at 1% level.

Next, we control for demographic characteristics and finally, both the disease and demographic variables. We do so by incorporating age of the patient, whether the patient is female, whether the patient is head of the household, whether the religion of patient is

Islam, whether head of the household is female and whether the household lives in a rural area in the regression.

The results are given in column 5 and 6 respectively of table 3. When controlled for demographics only, there is a minimal change in income variable with slight increase in statistical significance, even though p-value stays over 10%. The coefficient of total land owned is however significant at 5% level and went down slightly to .046. The results are similar when controlled for both diseases and demographics: income remains insignificant while total land is significant at 1% level and is around .054.

Among the disease and demographic variables, only the dummy variables for patients that have two diseases, that are not female and not Muslim and lives in rural area are statistically significant and face higher incidence of corruption. Dummy variables for patients with chronic diseases and three diseases are significant and has lower incidence of corruption when demographics are not considered and dummy variable when household head is the patient is statistically significant and also pay less when disease variables are not considered.

We now turn to total persons engaged in a Sub-District Health Complex. The result is given in column 1 of table 4. An additional engagement of one person in a Sub-district Health Complex decreases the incidence of corruption by .1% and it is statistically significant at 5% level. Considering mean TPE in a Sub-district Health Complex is 74 and s.d. is 65, this exhibits a significant effect. In column 2 of table 4, we control for annual income and total land owned and found no significant change in either the magnitude or the statistical significance of the coefficient of TPE. Furthermore, total land also statistically significant at 1% level with slight increase in the magnitude.

Since the decisions for how many persons to work on these health complexes come from the government and not market, TPE can be thought to be fairly exogenous. However, the government may decide to hire more staffs in sub-districts where there are more patients seeking for treatment and/or more importantly, where there are more patients visiting public health facilities.

Since HIES surveyed on a representative sample using stratified random sampling, we used the HIES data to proxy for these variables. More specifically, we aggregated number of patients in the survey for each sub-district who seek for some kind of treatment and also number of patients in the survey at each sub-district who went to public health facilities.

Since these two variables are highly correlated, we again analyze them separately. The result regarding number of patients seeking treatment in a sub-district is given in column 3 of table 4 where in column 5, the disease and demographics are also included. The TPE at SHC remained statistically significant at 1% level for both specifications. Furthermore, inclusion of disease and demographics increases the magnitude of the coefficient. Total land remained statistically significant at 5% level with higher magnitude as disease and demographics are controlled. The number of patients seeking treatment is also statistically significant at 1% level for all specifications with negative coefficients.

In column 4 and 6 of table 4, we control number of patients going to public health facilities without and with disease and demographic controls. Total persons engaged in an SHC remains to be statistically significant at 5% and 1% levels respectively with negligible changes in magnitudes. Total land is also statistically significant at 5% and 1% respectively and changes in the magnitude are also small. Total land continued to be statistically significant at 1% level and there is also moderate increase in magnitude of coefficient. The number of patients going to public health facilities in a sub-district however is not statistically significant in either specification.

Finally, among the disease and demographic variables, only the dummy variables for patients that do not have physical problem and have two diseases, are household heads and live in urban areas are statistically significant and also face a lower incidence of corruption.

We now focus on travel variables. We consider transportation cost and travel time separately in column 1 and 2 in table 5. We found that a one taka increase in transportation cost increases the probability of payment by only .05% and it is statistically significant at 1% level. In case of travel time, a one minute increase in travel time increases the probability of payment by .1% and it is statistically significant at 5% level.

We next control for income and wealth variables, travel modes, disease and demographic variables. For travel mode variables, we aggregate different travel modes into three distinct modes: patients who used fast (and motorized) transport, slow (and non-motorized) transport and other type of transport. The results are presented in column 3 and 4 of table 5. It turns out that there is no significant change in the coefficient of transportation cost and is statistically significant at 5% level. Travel time however is not statistically significant. In addition, total land continued to be statistically significant at both specifications at minimum 5% level.

Finally, we control for total persons engaged in a Sub-District Health Complex. The results are given in column 5 and 6 in table 5. Neither transportation cost nor travel time are statistically significant. Total land owned and total persons engaged in a Sub-District Health Complex however remained statistically significant at minimum 5% level.

Among the travel mode, disease and demographic variables, dummy variables for patients using slow transport, having two diseases and living in rural areas are statistically significant with sign-wise stable coefficients. Dummy variable for female patients is also statistically significant and has a negative coefficient. Dummy variable for household head patients is also statistically significant in travel time specifications.

The results that the magnitude of transportation cost and travel time is very small indicate some evidence on the process that corruption takes place, as suggested by anecdotal evidence presented before. Note that travel variables affect the payment only through bargaining. Now if this bargaining takes place after the decision of whether to pay or not (according to the anecdote), travel variable should not have a large impact on incidence of corruption but it should have significant impact on determining amount of unofficial payment to be made. This is precisely what our results indicate, as we will show later.

VI. Extent of Corruption: Who Pays More?

To analyze the unofficial payments, we consider a standard tobit model since for more than 50% observations, the payments are zero suggesting corner solutions. The model is

$$y^* = \alpha + \beta_1 \cdot income\ variables + \beta_2 \cdot TPE + \beta_3 \cdot travel\ variables + \beta_4 \cdot other\ controls + u$$

$$y = y^* \ if \quad y^* > 0$$

$$y = 0 \ if \quad y^* \leq 0$$

where y_i is the observed illegal payment.

Consider income and total land first. We use total annual income to represent income and total land owned to proxy for wealth of the household. We first consider these variables separately and then together. The results are given in column 1, 2 and 3 of table 6. We found that annual income has never appeared to be statistically significant irrespective of whether it is considered alone or with total land owned. The sign however remained positive, as we have expected. The total land owned however entered positively and is statistically significant at 5% level whether or not it is considered with annual income. The magnitude of the variable is also stable around 14.

We then control for disease and demographic variables, first separately and then together. The results are given in column 4, 5 and 6 in table 6. Income remained statistically insignificant for all specifications. Total land is statistically significant at 5% when only disease variables are considered. However, when we control next for demographic variables, either separately or combined with disease variables, we found that total land marginally fails to be statistically significant in one specification (p-value is 18.2 and 11.2 respectively). Surprisingly, the p-value of annual income in these two models also depicts that they are insignificant by a narrow margin (11.9 in both occasions). Hence, partially consistent with the literature, we found limited evidence of income and wealth explaining variation in unofficial payment significantly.

Among the disease variables, all the dummy variables representing type of disease except female disease are statistically significant and has positive coefficient whereas chronic variable is significant when demographics are not included. Among the demographics, patients who are not Muslim and lives in rural area pays more and these variables are statistically significant at 1% level.

The results on travel variables are given in column 1 and 2 in table 7. We consider both the transportation cost (expressed in taka) and travel time (expressed in minutes), but we consider them separately since these variables are highly correlated. We found that both transportation cost and travel time enters into the model positively and both variables are statistically significant at 1% level.

One possible explanation is that patients with higher income and wealth may choose more expensive transportation modes which are also faster resulting into higher transportation cost and lower travel time. Since higher income and wealth represent willingness to pay and total land also explains the payment significantly, this may also influence the payment through transportation cost and less directly, through travel time. On the other hand, higher distance transportation cost and travel time will be higher. We therefore control for these variables by including total annual income and total land owned.

The results are given in columns 3 and 4 of table 7. The results are almost the same for transportation cost: the magnitude remains almost the same with the same significance level. For travel time, the level of significance is the same even though magnitude of the coefficient is slightly smaller. Furthermore, total land is also statistically significant even though total annual income is not statistically significant.

An interesting result is that both the magnitude and level of significance of total land owned (and also total annual income) is lower in specifications of transportation cost than that of travel time. This indicates that the transportation cost being the monetary value takes up some of the explanatory power of these income and wealth variables than travel time. This trend remains true for all the models discussed below for the land variable and for most models in case of income variable.

It is also possible that patients with more serious illness or injury may take more expensive and quicker transportation mode and may also end up paying more due to weaker bargaining power resulting from more serious illness or injury. In column 5 and 6 of table 7, we control for travel modes and in column 7 and 8 of table 4, we additionally control for disease variables with income and wealth.

After controlling for travel modes, coefficient of transportation cost only changed to .35 and it is statistically significant at 1% level. The travel time is also statistically significant at 10% level; even though the magnitude of the coefficient is now lower (.32). The total land owned is significant at 5% level with positive coefficient in specification with travel time. It is however not significant in specification with transportation cost.

To control for diseases, we use the same set of disease variables used before. We found that the coefficient of transportation cost goes down slightly to .348, but remains significant at 1% level. Travel time however fails to be statistically significant marginally (p-value = .11) with a lower coefficient of around .29. Total land owned continues to be statistically significant in both specifications with more in the model with travel time.

Finally, we additionally control for demographic characteristics of the patients. The results are presented in column 9 and 10 of table 7. The transportation cost is still significant at 1% level and remains the same (.35). The travel time is also significant at 10% level and is approximately .33. Total land is also statistically significant in specification with travel time, even though it fails to be significant marginally (p-value = .17).

All the travel mode variables are statistically significant and well above zero for all specifications. Dummy variable for patients having two diseases are also statistically significant. Dummy variable for patients having three diseases is significant for three specifications. Dummy variables for chronic disease and infectious or communicable disease are statistically significant in transportation cost specifications.

We now consider total persons engaged in a Sub-district Health Complex. The results are given in table 8. In column 1, we consider total persons engaged only. As expected, we find that it enters with a negative coefficient and is also statistically significant at 10% level (p-value is .059).

For number of patients seeking treatment, the results are given in columns 2, 4 and 6 in table 8. In column 2, no other control variable is considered. The variable still has a negative coefficient with greater in magnitude (-.40) and significance (5% level) when controlled for number of patients seeking treatment. In column 4, transportation cost and all other variables that have been considered so far (as in column 9 in Table 7) is included in the model. The magnitude of the coefficient goes down (in absolute terms) a little (-.37), but it is still negative and statistically significant at 5% level. Note also that transportation cost is still statistically significant at 1% level with magnitude of the coefficient .2753, but income and total land are not.

Finally, we control for travel time and all other variables used so far (as in column 10 of Table 7). Total persons engaged has a higher (in absolute terms) coefficient (-.458) with a negative sign and at 1% significant level. Travel time is not statistically significant but total land owned is. The number of patients seeking any kind of treatment is statistically significant at 1% level with negative coefficients at all specifications.

In column 3, 5 and 7of table 8, we analyze the effect of controlling for number of patients going to public health facilities. Column 3 presents result when only this variable is controlled for. It turned out that the magnitude of the coefficient of total persons engaged is the lowest (in absolute terms) at -.27 and it is statistically significant at 10% level.

In column 5 we have controlled for transportation cost and all other variables (as in column 9 of table 7). It turns out that the magnitude of the coefficient increases (in absolute terms) to -.3167 and is also statistically significant at 5% level. Note also that transportation cost is still statistically significant at 1% level with minor change in the magnitude of the coefficient whereas income and total land are not significant.

Finally, in column 7, travel time and all other variables have been controlled for. Total persons engaged now has even a higher coefficient (in absolute terms) and also statistically significant at 5% level. Travel time is not significant whereas total land owned is. Total number of patients going to public health facilities in a sub-district is not significant.

Among control variables used in table 8, dummy variable for patients using slow transport is statistically significant in all specifications. Dummy variable for patients living in rural areas is statistically significant with all specifications where number of patients going to public facilities is a control variable. In addition, dummies for patients having cardio-vascular and respiratory disease, other disease and two diseases are statistically significant whenever transportation cost used. On the other hand, dummies for patients who used fast transport and are heads of households are statistically significant whenever travel time is used.

VII. Robustness Check by comparison with HIES 2000

For robustness checks, we do the above analysis with the HIES 2000 data and compare with the above results. For brevity, we only compare the final specifications for incidence of corruption and unofficial payment where all the variables except total persons engaged are included. Total persons engaged can not be used due to data unavailability.

The results are given in table 9. The odd numbered columns represent results using HIES 2000 data whereas even numbered columns represent results using 2005 data. More specifically, the incidence of corruption with transportation cost is represented in column 1 and 2 for HIES 2000 and HIES 2005 respectively. It turns out that transportation cost is also statistically significant with positive coefficient in 2000 and like 2005, the magnitude of the coefficient is very insignificant. Unlike 2005, however, total land owned in 2000 is not statistically significant. Total annual income remained statistically insignificant. Among other variables, dummy variable representing patients coming from rural areas is the only statistically significant variable and they tend to pay more.

In column 3 and 4, we analyzed incidence of corruption with travel time using HIES 2000 and 2005 respectively. Like 2005, travel time, total income and total land owned are not statistically significant. The only variable to be significant is the dummy variable representing patients coming from rural area and like the above specifications with transportation cost, the coefficient is positive.

In columns 5, 6, 7 and 8, we analyze the unofficial payments made as consultation fees. In 5 and 6, we present results with transportation cost, income and total land using HIES 2000 and HIES 2005 respectively. It turns out that transportation cost is statistically significant at 1% level with a coefficient three times larger in magnitude than HIES 2005. Unlike 2005, however, total land owned is statistically significant and even more striking, the coefficient is negative. Total income continued to be statistically insignificant. Among other variables, dummy variable representing patients coming from rural area remained statistically significant with positive coefficient.

Finally in column 7 and 8, we present results on unofficial payment with travel time, total income and total land. Travel time like HIES 2005 enters positively into the unofficial payment equation. The coefficient, like transportation cost, is much larger than that in HIES 2005 and it is also statistically significant at 1% level. Total land, like specification with transportation cost, is not statistically significant and has a negative coefficient. Total income is not statistically significant. Among other variables, age of the patient, dummy variable representing patients having two diseases or symptoms and dummy variable representing patients coming from rural areas are statistically significant.

VIII. Conclusion

This paper is an important contribution to the growing literature of empirical micro studies of corruption. It investigates the factors that affect the unofficial payments made to the doctors as consultation fees in Bangladesh. Consistent with hold-up theories, we find that patients having more relation-specific investments, represented by transportation cost and travel time, end up paying more. Furthermore, an increase in number of total persons engaged in Sub-District Health Complex, which imply lower market power of the staff of government health staff, not only reduces amount of unofficial fees paid but also the incidence of corruption. Finally we also found that land rich patients are more likely to pay the unofficial payments and pay more. However, income does not significantly impact either incidence or extent of corruption.

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Table 1: Comparison of all the patients and patients going to public health facilities

	Full sample of Patients			Patients going to public health facilities			T statistic
	Mean	S. D.	n	Mean	S. D.	n	
Total Income (in thousand taka)	85.543	125.426	5580	95.494	137.34	484	-1.2965
Total land owned (in acres)	.895	1.756	5580	.669	1.224	484	0.9598
Age of the patient	24.413	21.662	5579	26.557	21.528	483	-1.9618
Dummy whether a patient lives in rural area	.62	.486	5580	.475	.5	484	6.3449
Dummy if the head of household is female	.034	.182	5580	.039	.194	484	-0.3083
Dummy if patient is female	.508	.5	5580	.519	.5	484	-0.6461
Dummy if household head is patient	.207	.504	5580	.231	.422	484	-1.0604
Dummy if the patient is Muslim	.9	.3	5580	.893	.31	484	0.4597
Consultation fee (in Taka)	37.781	92.758	5580	43.538	102.9	484	0.8608
Transportation cost (in Taka)	28.221	155.103	5580	56.932	171.652	484	-3.5624
Travel time (in minutes)	26.62	46.22	4739	37.623	54.599	406	-4.1212
Dummy whether patient availed a fast (motorized) transport	.092	.289	5577	.21488	.411	484	-7.5988
Dummy whether patient availed a slow (non-motorized) transport	.345	.476	5577	.5165	.500	484	-7.2493
Dummy whether patient availed any other type (not defined) of transport	.087	.282	5577	.01	.101	484	5.4329
Dummy whether the patient has a chronic disease	.223	.416	5580	.205	.404	484	0.0771
Dummy whether the patient is suffering from a cardio-vascular or respiratory disease	.084	.277	5580	.114	.318	484	-2.8059
Dummy whether the patient is suffering from a infectious or communicable disease	.164	.37	5580	.147	.354	484	0.5175
Dummy whether the patient is suffering from a physical problem	.247	.431	5580	.246	.431	484	1.1818
Dummy whether the patient is suffering from a female disease	.009	.094	5580	.012	.111	484	-0.8781
Dummy whether the patient is suffering from any other disease	.087	.282	5580	.159	.366	484	-1.8862
Dummy whether the patient is suffering from two diseases	.219	.414	5580	.147	.354	484	3.0389
Dummy whether the patient is suffering from three diseases	.044	.205	5580	.027	.162	484	0.7201

Note: We omit education of, say, head of household is a partially ordinal variable and therefore, omitted. More specifically, for numbers 0 to 10, the number represents number of years studied. But above it, it becomes categorical.

Table 2: Descriptive statistics of patients going to public health facilities

Variable name	Mean	S. D.	n
Dummy if a unofficial payment is made	.44	.497	484
Payment made as consultation fee (in taka)	43.538	102.9	484
Payment made as consultation fee if only positive payments are considered (in taka)	98.93	136.447	213
Transportation cost (in taka)	56.932	171.652	484
Transportation cost of patients who made positive payments (in taka)	85.005	237.586	213
Travel time (in minute)	37.623	54.599	406
Travel time of patients who made positive payments (in minute)	44.56	64.189	168
Annual Income (in thousand taka)	95.494	137.336	484
Annual income of patients who made positive payments (in taka)	99.849	90.755	213
Total Land owned (in acres)	.669	1.224	484
Total Land owned (in acres) of patients who made positive payments (in taka)	.8615	1.395	213
Total persons engaged in a Sub-District Health Complex	73.979	65.067	194
Dummy whether patient availed a fast (motorized) transport	.21488	.411	484
Dummy whether patient availed a slow (non-motorized) transport	.5165	.500	484
Dummy whether patient availed 'other' (not defined) type of transport	.010	.101	484

Note: Fast (motorized) transport includes private car, taxi, bus, auto rickshaw, ambulance, and engine boat. Slow (non-motorized) transport includes rickshaw, non-motorized van, cart, non-motorized boat. The base for all the transport dummies is walking.

Table 3: Incidence of Corruption and annual income and total land owned

Dependent Variable: Dummy = 1 if a payment is made	1	2	3	4	5	6
Annual Income	.0001 (.0002)		.0001 (.0002)	.0001 (.0002)	.0003 (.0002)	.0003 (.0002)
Total land owned		.0577*** (.0191)	.0574*** (.0191)	.0634*** (.0197)	.0462** (.0203)	.0535*** (.0208)
Chronic disease				-.1162** (.0578)		-.0815 (.0636)
Cardio-vascular or respiratory disease				-.0227 (.0829)		.0233 (.0883)
Infectious or communicable disease				.1116 (.0741)		.0981 (.0761)
Physical problem				.1196* (.0647)		.155** (.0677)
Female disease				-.0821 (.2014)		.007 (.218)
Other disease				.0487 (.0713)		.0523 (.0727)
Patient has two diseases				-.3127*** (.0557)		-.3230*** (.0557)
Patient has three diseases				-.2862** (.1053)		-.2419 (.1222)
Age of the patient					-.0007 (.0014)	-.0009 (.0015)
Female					-.1212** (.0593)	-.1280*** (.0605)
Head of household					-.1459* (.0807)	-.1238 (.0834)
Muslim					-.1838** (.0749)	-.1731*** (.0773)
Head of household is female					.0562 (.1482)	.0615 (.153)
Rural area					.1610*** (.0468)	.1575*** (.0485)
R-sq	.0006	.0142	.0296	.0595	.0583	.097
Observations	484	484	484	484	483	483

Note: The dependent variable=1 if an unofficial payment is made and equals zero if no payment is made. All the models are Probit models. The coefficients reported are marginal effects.

Table 4: Incidence of Corruption and Total persons engaged in a Sub-District Health Complex

Dependent Variable: Dummy = 1 if a payment is made	1	2	3	4	5	6
Total Persons Engaged	- .0011** (.0006)	-.0013** (.0006)	-.0016*** (.0006)	-.0014** (.0006)	-.0024*** (.0008)	-.0022*** (.0007)
Annual Income		.0009 (.0006)	.0009 (.0006)	.0008 (.0006)	.0008 (.0006)	.0007 (.0006)
Total land owned		.0696*** (.0281)	.0574** (.0286)	.069*** (.0281)	.0741** (.0327)	.082*** (.0328)
Num of patients seeking treatment in Sub-district			-.0066*** (.0019)		-.0056*** (.0022)	
Num of patients going to SHC in Sub-district				.0082 (.0123)		.0145 (.0138)
Chronic disease					-.1197 (.1109)	-.1432 (.1076)
Cardio-vascular or respiratory disease					.0978 (.1496)	.0950 (.1447)
Infectious or communicable disease					.1003 (.1244)	.1024 (.1231)
Physical problem					.2663** (.1048)	.238** (.1053)
Female disease					Dropped	Dropped
Other disease					.2219* (.1140)	.1916 (.116)
Patient has two diseases					-.2343* (.1239)	-.2691** (.1168)
Patient has three diseases					-.1481 (.279)	-.0730 (.2828)
Age of the patient					.0031 (.003)	.00299 (.0029)
Female					-.1627 (.102)	-.1632 (.1018)
Head of household					-.3777** (.1358)	-.3575** (.14)
Muslim					-.0978 (.1551)	-.1012 (.1519)
Head of household is female					.1582 (.2674)	-.1632 (.1018)
Rural area					.2019** (.0894)	.2907*** (.0817)
R-sq	.0016	.0516	.0986	.0533	.1929	.1724
Observations	194	194	194	194	193	193

Note: The dependent variable=1 if an unofficial payment is made and equals zero if no payment is made. All the models are Probit models. The coefficients reported are marginal effects.

Table 5: Incidence of Corruption and Travel related variables

Dependent Variable: Dummy = 1 if a payment is made	1	2	3	4	5	6
Transportation Cost	.0006*** (.0002)		.0005** (.0003)		.0003 (.0005)	
Travel Time		.001** (.0005)		.0007 (.0005)		.0016 (.002)
Annual Income			.0001 (.0002)	.0003 (.0003)	.001 (.0007)	.0004 (.0008)
Total land owned			.0442** (.0209)	.0795*** (.0278)	.066** (.0332)	.1822*** (.0593)
Total Persons Engaged					-.002*** (.0007)	- .002** (.0009)
Fast transport			.1506)* (.0793)	.1714** (.0864)	.1261 (.1416)	.2484 (.1521)
Slow transport			.2111987*** (.0579)	.2195*** (.0622)	.3337*** (.1024)	.3825*** (.117)
Other transport			.2553** (.2123)	.2934 (.2082)	Dropped	Dropped
Chronic disease			-.0925 (.0649)	-.0335 (.0699)	-.1162 (.1141)	01536 (.1284)
Cardio-vascular or respiratory disease			-.0153 (.0899)	-.0735 (.0962)	.1159 (.1503)	.0143 (.1674)
Infectious or communicable disease			.0723 (.0772)	.1094 (.0888)	.0896 (.1307)	.096 (.1528)
Physical problem			.1092 (.0697)	.0566 (.0737)	.1789 (.1133)	.076 (.1347)
Female disease			-.0874 (.2262)	-.0114 (.221)	Dropped	Dropped
Other disease			.0019 (.0746)	-.0859 (.0777)	.2003 (.1198)	.0436 (.1642)
Patient has two diseases			-.3041*** (.0591)	-.328*** (.0579)	-.2849** (.1189)	-.2619* (.1420)
Patient has three diseases			-.1967 (.1376)	-.1646 (.158)	.0660 (.3055)	.0740 (.3786)
Age of the patient			-.001 (.0016)	-.0005 (.0017)	.0018 (.003)	.0032 (.0033)
Female			-.1265016** (.0622)	-.1677** (.0685)	-.1386 (.1065)	-.2508** (.1228)
Head of household			-.1233 (.0875)	-.1619* (.0889)	-.2716 (.1618)	-.4078** (.1484)
Muslim			-.156549** (.0803)	-.1046 (.0892)	-.1225 (.15)	-.0356 (.1821)
Head of household is female			.0668 (.1547)	.089 (.1829)	.0925 (.2865)	.2224 (.3179)
Rural area			.1573*** (.0504)	.1109** (.0561)	.2811*** (.0839)	.231** (.1012)
R-sq	.019	.0085	.1306	.1502	.204	.2662
Observations	484	406	483	406	192	154

Note: The dependent variable=1 if an unofficial payment is made and equals zero if no payment is made. All the models are Probit models. The coefficients reported are marginal effects.

Table 6: Unofficial payment and annual income and total land owned

Dependent Variable: Unofficial payment	1	2	3	4	5	6
Annual Income	.0599 (.0702)		.0541 (.0708)	.0361 .0694	.1385 (.0887)	.1359 (.0868)
Total land owned		14.4865** (7.377)	14.228** (7.3792)	15.033** (7.2816)	10.1904 (7.6212)	12 (7.5465)
Chronic disease				-40.4053* (24.7433)		-39.0525 (25.5276)
Cardio-vascular or respiratory disease				59.1783* (33.6631)		65.8215** (33.7893)
Infectious or communicable disease				57.3331** (29.3361)		54.9428* (29.047)
Physical problem				54.2535** 25.7518		62.4422** (26.3503)
Female disease				-1.9037 (87.8567)		35.7268 (87.1768)
Other disease				52.2459** (27.8984)		50.9844* (27.6328)
Patient has 2 diseases				-160.5068*** (33.6435)		-160.8828*** (33.4860)
Patient has 3 diseases				-172.1997** (71.0659)		-140.6048** (69.7086)
Age of the patient					.0508 (.5699)	-.1336 (.5882)
Female					-35.8976 (24.1098)	-35.8968 (23.682)
Head of household					-15.747 (34.7649)	-4.1775 (34.0567)
Muslim					-81.0924*** (29.3819)	-71.6147*** (28.7948)
Head of household is Female					73.6611 (58.6067)	73.2157 (58.1217)
Rural area					50.1524*** (19.5799)	47.9949*** (19.4031)
R-sq	.0002	.0012	.0014	.0106	.0074	.0164
Observations	484	484	484	484	483	483

Note: The dependent variable is amount of unofficial payment. All the models are standard Tobit models.

Table 7: Dependent Variable: Amount of Unofficial payment paid

Dependent Variable: Unofficial Payment	1	2	3	4	5	6	7	8	9	10
Transportation cost	.3781*** (.0426)		.3778*** (.0429)		.3529 (.0443)		.3567*** (.0437)		.3517*** (.0445)	
Travel Time		.4735*** (.1696)		.4704*** (.1688)		.3211* (.1825)		.2892 (.1817)		.3286* (.181)
Annual income			-.0144 (.0669)	.1882* (.1096)	-.0328 (.0672)	.1425 (.1095)	-.045 (.0658)	.1148 (.1085)	.0146 (.0788)	.1226 (.1074)
Total land owned			11.6607* (6.341)	19.11** (8.1688)	9.2717 (6.2367)	16.564** (7.96)	9.9713* (6.1589)	17.05** (7.9422)	8.745 (6.4149)	15.6065* (8.3404)
Fast transport					80.4321*** (25.7761)	100.7554*** (31.6964)	72.0856*** (25.4212)	95.9026*** (31.5826)	58.9871** (25.7087)	86.3616*** 31.8141
Slow transport					84.7476*** (21.4021)	99.3949*** (25.33955)	77.5074*** (21.1427)	92.104*** (25.349)	75.8269*** (20.9093)	89.187*** (25.1182)
Other transport					134.4164* (78.9874)	147.2833* (86.7401)	158.6725** (77.1919)	183.652** (84.9571)	155.5359** (77.1461)	186.3369** (84.6568)
Chronic disease							-41.6064** (21.0044)	-12.4397 (24.6966)	-39.4871* (21.8522)	-4.6935 (25.7334)
Cardio-vascular or respiratory disease							29.8857 (29.0529)	11.8265 (37.2146)	36.7025 (29.3254)	15.1654 (37.4071)
Infectious or communicable disease							43.0765* (24.8837)	39.8476 (31.4026)	40.5118* (24.8047)	32.0419 31.4202
Physical problem							32.3319 (21.9607)	7.9341 (26.3834)	41.6161* (22.611)	15.768 (26.8741)
Female disease							-77.7832 (82.2147)	-10.0305 (83.7516)	-41.7854 (81.7402)	21.823) (83.6774)
Other disease							21.0878 (23.966)	-6.1802 (29.9528)	23.585 (23.9209)	-8.8294 (29.9098)
Patient has two diseases							-127.8858*** (28.7406)	-157.2963*** (38.3004)	-133.2553*** (28.8197)	-155.6687*** 38.19762
Patient has three diseases							-131.4797** (59.6945)	-142.0103* (78.3178)	-110.034* (59.4336)	-114.3256 (77.9829)
Age of the patient									-.4957 (.5116)	-.2435 (.6261)
Female									-20.6679 (20.3832)	-48.8192* (25.657)
Head of household									10.8011 (29.6701)	-17.3890 (36.6218)
Muslim									-33.3740 (25.2497)	-57.79* (30.408)
Head of household is female									71.1234 (49.2692)	52.0483 (65.8943)
Rural area									37.9161** (16.9910)	29.5812 (20.8056)
R-sq	.0223	.0031	.0234	.0075	.0291	.0141	.0381	.0238	.0416	.0282
Observations	484	406	484	395	484	406	484	406	483	406

Note: The dependent variable is amount of unofficial payment. All the models are standard Tobit models. The coefficients reported are marginal effects.

Table 8: Dependent Variable: Amount of Unofficial payment paid

Dependent Variable: Unofficial Payment	1	2	3	4	5	6	7
Total Persons Engaged	-.303* (.16)	-.4007** .1639	-.2739* (.1582)	-.3761** (.1602)	-.3167** (.1591)	-.458*** (.1812)	-.4217** (.187)
Transportation Cost				.2753*** (.0807)	.2733*** (.0835)		
Travel Time						.1864 (.1618)	.2727 (.1724)
Annual Income				.1554 (.1326)	.1671 (.1348)	-.0515 (.1513)	-.021 (.1532)
Total land owned				2.4157 (6.5587)	5.6667 6.724	17.579** (8.0557)	19.1879** 8.3897
Num of patients seeking treatment in a Sub-district		-1.917*** (.4977)		-1.486*** (.487)		-1.3654*** .5464	
Num of patients going to SHC in Sub-district			-4.1395 (3.1143)		-1.2363 (2.9507)		1.4434 (3.3912)
Fast transport				39.9939 (31.3641)	38.9455 (31.7166)	107.8525*** (34.9324)	108.8103*** (35.8881)
Slow transport				70.4075*** (25.3433)	64.5689*** (25.627)	87.8802*** (29.899)	84.3539*** (30.5633)
Other transport				-418.5041 (missing)	-499.4586 (missing)	-312.4578 (missing)	-367.0293 (missing)
Chronic disease				-11.9831 (23.6615)	-16.6165 (23.9381)	28.1255 (25.8185)	24.1194 (26.3877)
Cardio-vascular or respiratory disease				60.8903** (30.9919)	53.4686* (31.5374)	48.4023 (32.407)	42.9957 (33.3497)
Infectious or communicable disease				(26.1667) (27.4691)	22.4082 (27.6404)	6.36079 (30.6669)	4.7606 (31.473)
Physical problem				34.6357 (24.2574)	30.3636 (24.6849)	22.1111 (27.5793)	10.2077 (28.3436)
Female disease				-626.0894 (missing)	-591.6971 (missing)	-573.8254 (missing)	-553.8276 (missing)
Other disease				69.1243*** (25.322)	56.09333** (25.5067)	29.6246 (31.2983)	11.0832 (31.3881)
Patient has two diseases				- 74.90739*** (30.2228)	- 84.8687*** (30.4735)	-39.96809 35.5161	-50.4981 (36.5378)
Patient has three diseases				-17.18645 (61.8583)	6.6964 (62.1344)	-65.6847 (79.7699)	-52.0964 (83.4336)
Age of the patient				-.1522014 .584833	-.1399 (.5976)	.05479 (.6594)	.2412 (.6809)
Female				1.3511 (22.2819)	-5.5386 (22.8124)	-41.7716 (25.9095)	-48.4103* (26.489)
Head of household				-3.2582 (36.9562)	-8.291 (37.9499)	-77.7444* (41.3089)	-82.8693* (42.7793)
Muslim				-14.3094 (30.7305)	-22.87469 (31.553)	-52.5687 (34.9088)	-46.3142 (36.3286)
Head of household is female				28.7491 (59.5621)	43.0164 (61.084)	68.7286 (71.6203)	84.9254 (73.8622)
Rural area				16.1134 (19.7296)	35.4457* (19.2409)	13.4367 (23.0488)	38.141* (22.39)
R-sq	.0028	.0145	.004	.0506	.0437	.0585	.0526
Observations	194	194	194	194	194	157	157

Note: The dependent variable is amount of unofficial payment. All the models are standard Tobit models. The coefficients reported are marginal effects.

Table 9: Comparisons between results using HIES 2000 and 2005

	Dependent Variable: Dummy = 1 if a payment is made				Dependent Variable: Unofficial payment			
	1 2000	2 2005	3 2000	4 2005	5 2000	6 2005	7 2000	5 2005
Transportation Cost	.0007*** (.0002)	.0005** (.0003)			1.2709*** (.1155)	.3517*** (.0445)		
Travel Time			.0003 (.0005)	.0007 (.0005)			1.1166*** (.3811)	.3286* (.181)
Annual Income	.0001 (.0001)	.0001 (.0002)	.0001 (.0001)	.0003 (.0003)	.02481 (.05887)	.0146 (.0788)	.0605 (.0765)	.1226 (.1074)
Total land owned	.0113 (.0187)	.0442** (.0209)	.0033 (.0191)	.0795*** (.0278)	-11.5068 (10.4148)	8.745 (6.4149)	-14.6003 (14.3687)	15.6065* (8.3404)
Fast transport	-.1878 (.1833)	.1506)* (.0793)	-.1764 (.1834)	.1714** (.0864)	-87.4368 (118.9694)	58.9871** (25.7087)	-80.9881 (155.6007)	86.3616*** 31.8141
Slow transport	.0768 (.1873)	.2112*** (.0579)	.0747 (.1869)	.2195*** (.0622)	34.2425 (118.5548)	75.8269*** (20.9093)	59.7936 (155.0853)	89.187*** (25.1182)
Other transport	-.2017 (.1602)	.2553** (.2123)	-.205 (.155)	.2934 (.2082)	-153.3646 (157.2364)	155.5359** (77.1461)	-209.4536 (207.1581)	186.3369** (84.6568)
Chronic disease	.0232 (.0548)	-.0925 (.0649)	.0637 (.0606)	-.0335 (.0699)	31.9046 (33.9898)	-39.4871* (21.8522)	73.7859 (48.4505)	-4.6935 (25.7334)
Cardio-vascular or respiratory disease	.1279 (.0851)	-.0153 (.0899)	.1059 (.0881)	-.0735 (.0962)	17.0583 (49.7446)	36.7025 (29.3254)	32.6051 (67.9248)	15.1654 (37.4071)
Infectious or communicable disease	-.0873 (.0713)	.0723 (.0772)	-.0391 (.0853)	.1094 (.0888)	-80.1902 (52.0208)	40.5118* (24.8047)	-38.8981 (75.9110)	32.0419 31.4202
Physical problem	.0122 (.0617)	.1092 (.0697)	.0149 (.0669)	.0566 (.0737)	7.6578 (38.8233)	41.6161* (22.611)	41.0921 (54.8456)	15.768 (26.8741)
Female disease		-.0874 (.2262)		-.0114 (.221)		-41.7854 (81.7402)		21.823) (83.6774)
Other disease	.0572 (.0587)	.0019 (.0746)	.043 (.0635)	-.0859 (.0777)	34.0652 (37.1168)	23.585 (23.9209)	69.599 (52.4864)	-8.8294 (29.9098)
Patient has two diseases	-.0526 (.0575)	.3041*** (.0591)	-.0711 (.0618)	-.328*** (.0579)	-38.8199 (37.9332)	-133.2553*** (28.8197)	-92.2672* (53.7587)	-155.6687*** 38.19762
Patient has three diseases	-.0449 (.1038)	-.1967 (.1376)	.0283 (.1169)	-.1646 (.158)	-18.833 (67.4378)	-110.034* (59.4336)	48.7433 (91.451)	-114.3256 (77.9829)
Age of the patient	.0014 (.0013)	-.001 (.0016)	.0016 (.0014)	-.0005 (.0017)	.9325 (.8019)	-.4957 (.5116)	2.0064* (1.1643)	-.2435 (.6261)
Female	Dropped	-.1265** (.0622)	Dropped	-.1677** (.0685)	Dropped	-20.6679 (20.3832)	Dropped	-48.8192* (25.657)
Head of household	.0554 (.0617)	-.1233 (.0875)	.0341 (.0675)	-.1619* (.0889)	39.529 (37.4573)	10.8011 (29.6701)	-11.8224 (54.0034)	-17.3890 (36.6218)
Muslim	.0446 (.0743)	-.1566** (.0803)	.0365 (.0852)	-.1046 (.0892)	41.8502 (50.2846)	-33.3740 (25.2497)	96.9329 (75.578)	-57.79* (30.408)
Head of household is female	-.0417 (.0698)	.0668 (.1547)	-.1103 (.0746)	.089 (.1829)	-62.3899 (47.3782)	71.1234 (49.2692)	-108.59 (73.9843)	52.0483 (65.8943)
Rural area	.0902** (.0442)	.1573*** (.0504)	.0913* (.0483)	.1109** (.0561)	70.7874** (29.2565)	37.9161** (16.9910)	99.1172** (41.4858)	29.5812 (20.8056)
R-sq	.0983	.1306	.0811	.1502	.0449	.0416	.0194	.0282
Observations	581	483	488	406	581	483	488	406

Note: A probit model is used to analyze the incidence of corruption. In case of unofficial payments, a tobit model is used. We can not include female disease since this have been used as an option for type of disease in HIES 2000.

Appendix

Table A1: Total and average number of patients at different hospitals

Type of Hospitals	Number of Hospitals	Total number of patients	Average Number of patients	Estimated total number of patients	Percentage of patients
Medical College Hospitals	10	2764824	276482	3592466	7.8
General Hospitals (250 bedded)	2	209892	104946	944514	2.1
District Hospitals	41	3552924	86657	4072879	8.8
Sub-Districts Health Complexes	350	19075504	54501	22508913	48.8
Union Sub-Centers	1362	14979600	10998	14979600	32.5

Note: Number of hospitals in each category represents the number of facilities from which this data was available. The total and average number of patients represents number of outpatients in those facilities. The estimated total number of patients is computed by average number of patients × total number of facilities.