

# **Corruption and Users in Douala-Cameroon Public Hospitals: An Evaluation of Determinants**

By

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## List of acronyms

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<b>INS</b>	Institut National de la Statistique (National Institute of Statistics)
<b>MDGs</b>	Millennium Development Goals
<b>PRS/ICRG</b>	Political Risk Services/International Country Risk Guide
<b>TI</b>	Transparency International
<b>WWGI</b>	World Wide Governance Indicators

# Abstract

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This paper examines the factors that determine an individual's exposure to corruption in public hospitals in Douala, Cameroon. A survey of 407 users who attended these hospitals revealed corruption to be prevalent in services that are offered in sections such as reception, hospitalization and the drugstore. Estimates obtained through odds ratios reveal that in general, the determinants of a user's exposure to corruption vary from one hospital to another and even from one service to another. For example, in the hospitalization service of the General hospital, these determinants are: Income above 250,000 FCFA, gender (male), educational level below university, and age over 40 years. On the contrary, in the hospitalization service of the Bonassama hospital, it is an income below 250,000 FCFA, woman, educational level below university, and age below 40 years. However, the educational level below university appears as a common determinant of corruption in all services and almost all hospitals. This allowed us to propose a typology of hospitals based on the factors behind this phenomenon.

**Key words:** *Corruption, Public hospitals, Prevalence rate, Odds ratio, Cameroon.*

**JEL Classifications:** *C25; D23; I10*

# 1. Introduction

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**H**ealth is an important factor in economic growth and poverty reduction. This importance is also reflected through its place in the Millennium Development Goals (MDGs): among the eight<sup>1</sup>, three relate directly to health, and an additional one refers to access to affordable drugs in developing countries (Vian, 2008). Unfortunately, according to the final report of the United Nations summit on these objectives held in New York in September 2010, corruption is the first obstacle to their implementation. Also, this report calls nations to fight against it in all its forms.

Certainly, during the past three decades, international cooperation in the fight against corruption has significantly increased, thanks to the awareness of its negative consequences on economic growth in general (Mauro, 1995), and on population's health in particular (Gupta et al, 2002). Today, the fight against corruption is seen by most international organizations (e.g., the World Bank, International Monetary Fund) as a key component of their development policy (World Bank, 1997). However, despite this new orientation of development policies, corrupt practices have continued to be spread, especially in developing countries, due in part to the lack of knowledge related to the origins of this phenomenon in social sectors — education, justice, housing and health.

As far as health is concerned, most studies on corruption in the health sector were carried out under the leadership of various institutions (IMF, World Bank, universities). The authors of these works (Gupta et al, 2002; Mauro, 2002) used the general analysis methods of corruption in the public sector, based on the popular definition that "corruption is the abuse of public funds for personal gain." In this context, some authors have considered high corruption (Mauro, 2002; Azfar, 2005) related to high personalities and huge sums, and others, little corruption (Chaudhury et al, 2004; Nussbaum, 2006) involving minor civil servants and small amounts. The works of this literature are important because they have led to a better understanding of corruption in the health sector and, therefore, have proposed relevant measures to fight against this phenomenon. For example, there is evidence that by increasing transparency and obligation to give account in public health services, the level of corruption will decrease (Vian, 2008). However, these works have at least one gap: they do not inform us on corrupt exchanges that are practised between caregivers and patients. Indeed, these works explored the Transparency International corruption indexes (TI), those of the Political Risk Services / International Country Risk Guide (PRS / ICRG) and those of the World Wide Governance Indicators (WWGI) of the World Bank, which derived from the surveys made from investors operating across the world, but who are not in touch with health care personnel in public hospitals of those countries.

Yet, in recent years, the availability of data from household and company surveys help us understand the causes and consequences of this phenomenon<sup>2</sup>. In the Cameroonian case, Timnou and Feunon (2012) used data from the households survey conducted in 2001 by the National Institute of Statistics, to identify the determinants of corruption affecting households, notably in health and education sectors. Cameroon was ranked first among the most corrupt countries in the world by Transparency International in 1998 and 1999. This study revealed that petty corruption is practised in urban (cities and developed regions) than in rural areas. It also shows that rich households are negatively associated with little corruption, while households whose heads are able to read and write, or who have a high level of education, are more exposed to corruption.

But this study has some limitations. Indeed, as the authors themselves point out, the assessment of the determinants of exposure to corruption at the individual level is not performed because the data used refer only to heads of households and not to the members. In addition, they are global. Thus, for the health sector, the data used reveals, for example, that irregular fees are actually paid (or not) to access medical care or services. However, the type of service in question is ignored. Is it the hospitalization, emergency, drugstore or reception service?

The purpose of this study is to fill these gaps from a survey of users of public hospitals in Douala, Cameroon's economic capital. More specifically, we would like to know if factors such as income, age, educational level and gender are a determinant of exposure to corruption at the individual level. These specific objectives enable us to test the relationship between these factors and the level of corruption prevailing in services of these hospitals. For example, we will seek to find out, as suggested by many theoretical models (Kaufman and Wei, 1999; Lui, 1985), if income is an important determinant of the user's exposure to corruption. A user is more confronted with corrupt practices when he/she is rich. Also, civil servants target their victims based on their willingness or ability to pay. Such an argument underlines that the richest, people who have jobs or those who show the greatest tolerance vis-a-vis corruption, should be those who are asked a bribe the most (Lavalée et al, 2010). The predictions of this theoretical argument are often consistent with the results of empirical works. Hunt (2007) examined the role of wealth in determining corruption in public hospitals in Peru and Uganda. He found that, in general, the rich are probably more exposed to corruption than others. In this work, we will instead show that in almost 50% of hospitals studied, the poor are more vulnerable to corruption than the rich.

This study aims at contributing to the fight against corruption in these hospitals. Presently, the awareness campaign that public authorities organize against corruption in these hospitals is holistic, as they target all users and all hospitals' services. This approach costs much and remains inefficient. By identifying from the demand side, the most vulnerable users to corruption on the one hand, and from the supply side, the most corrupt services on the other, this study provides the opportunity to make segmented awareness campaigns. Thus, the fight against corruption will target the most vulnerable users and the most corrupt services. We expect this new approach to be less costly and more efficient.

The paper is structured as follows. Section two gives a brief review of the literature on corruption determinants. Section three focuses on the methodology and the conceptual model. Section four presents the results while section five concludes and recommends economic policy measures.

## 2. Literature review

It is recognized that the fight against corruption is an important item on the agenda of the Cameroonian government. But the results of this fight remain mitigated, due in part to the lack of knowledge of factors behind this phenomenon, particularly at the users' level. Yet, the economic literature is becoming more consistent about it.

According to the Becker's (1968) traditional analysis of crime, the user will engage in bribery or other forms of illegal behaviour if, for him/her, the advantages of such an action outweigh the potential costs. Similarly, an official will be corrupt when, in his/her mind, the benefits that he/she can expect from such behaviour will outweigh the expected costs. Assuming that the user has the choice between being corrupt and not being corrupt, and that eventually, he/she chooses the first alternative, he/she pays a bribe in return for the service rendered. However, he/she also endures what could be called the "moral cost" of corruption. This cost depends on his/her own ethical, cultural and religious criteria; it can depend on the size of the bonus to be paid to the official, but also on what other patients give (Klitgaard, 1989).

The multiple equilibria models assume that the expected gain of an agent depends on the number of other agents he/she believed to be corrupt. Corruption represents what theorists call the equilibria dependent on frequency (Cartier Bresson, 1998). The more there is corruption, the least it is costly for the briber and the state agent to initiate corrupt relationships, and this for two reasons: First, it is possible that the feeling of guilt engendered by corruption decreases as this practice spreads. Secondly, the spread of corruption would reduce the initiation costs of corrupt relationships. Indeed, as the number of corrupt bureaucrats grows, it becomes easier for an individual to find a corrupt state agent (Andvig and Moene, 1990). Gatti et al, (2003) showed, on a sample of 35 countries, that these social effects play an important role in determining individual attitudes vis-a-vis corruption. They found that people living in areas where individuals are on average less opposed to corruption, are the most tolerant of such practices (Lavalley et al, 2010).

Political scientists and economists suggest a large number of social, political and economic characteristics that may affect the costs and expected benefits of corrupt actions, or even both at once (Shabbir and Anwar, 2007; Timnou and Feunon, 2012). Mocan (2004) argues, following Treisman (2000), that an individual exposure to corruption depends not only on personal characteristics, but also on those of his/her country: age, income, gender, educational level, the legal system, culture, etc. This argument is indirectly quoted in Timnou and Feunon (2012)'s study on corruption in the Cameroonian health and education sectors. However, it seems difficult to identify the most relevant features insofar as the causes of corruption are always contextual,

rooted in the country's policies, in bureaucratic traditions and social history. In reality, corruption flourishes when institutions are weak, and when the state policies generate cash savings. Some characteristics of developing countries make it particularly difficult to control corruption. The normal work motivation of state agents may be initiated due to several factors including low wages<sup>3</sup> and promotions which are not related to performance. The dysfunctions of the state budget, the inadequate supplies and equipment, delays in the allocation of the budget funds and poor organization can demoralize these agents (World Bank, 1997).

Among the many costs of corruption, the risk of being arrested and getting punished appear as the most obvious and costly for some authors (Treisman, 2000; La Porta et al, 1999). Indeed, this risk depends on the country's legal system, and when the law is applied, it becomes a condition of control for corruption. However, harsh laws are not enough. Many very corrupt countries have exemplary formal laws. Unfortunately, these laws are devoid of their real meaning insofar as they are rarely applied (Rose-Ackerman, 1998). Furthermore, many formal rules are put in place to allow predation (traditional procedures or regulations perceived as illegitimate by citizens) (Cartier Bresson, 1998; De Soto, 1994).

Culture is often used as an important determinant of corruption. This implies that cultural characteristics of societies explain the prevalence of corruption (Nye, 1967). The custom of gift is one of the habits which lead to corruption. For example, in Africa, to make a gift to a public official who has fulfilled his/her regular duties is considered a gesture of gratitude. Can we not see a bribe which gratifies an official an extension of this practice? (Klitgaard, 1989). In reality, the border between spontaneous thankful gift and compulsory bribe tends to blur itself from the time when this practice becomes the rule rather than the exception (Médard, 2002). Religion is another cultural variable mentioned in the traditional literature<sup>4</sup> on the causes of corruption. Lavalée et al (2010) fail to establish that religion has a key role in corruption microeconomic data from 18 African countries.

### 3. Methodology and conceptual model

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The purpose of this study is to highlight the determinants of users' exposure to corruption in public hospital services in Douala, Cameroon. To achieve this goal, we will adopt a two-level process. First, we will present the theoretical model and secondly, the different stages of the methodology.

#### The conceptual model

Among the various theoretical models discussed in the previous section, that of Timnou and Feunon (2012) appears as the most simple and convenient to use to determine the factors responsible for petty corruption in the health and educational sectors. Moreover, in the Cameroonian case and in relation to these sectors, both authors used it to determine the factors responsible for petty corruption, particularly at the community and households heads' levels. Relative to the same country and the health sector, we will explore the same model to highlight the socio-demographic factors behind this phenomenon, but at the individual level. To achieve this goal, we needed to make a bivariate analysis.

We assume that petty corruption is part of everyday individual behaviour of patients. To pay bribes to have access to health care does not mean that these patients are unable to pay required fees for their medical care, but that the amounts of such fees are unofficial and unfair. We work in a context marked by a high degree of poverty (over 40% of the population lives below the poverty line), a poor governance that has survived structural<sup>5</sup> adjustment programmes (Timnou and Feunon, 2012), and a society in which corruption is the rule and not the exception. Petty corruption is so widespread that there is often no alternative for economic agents.

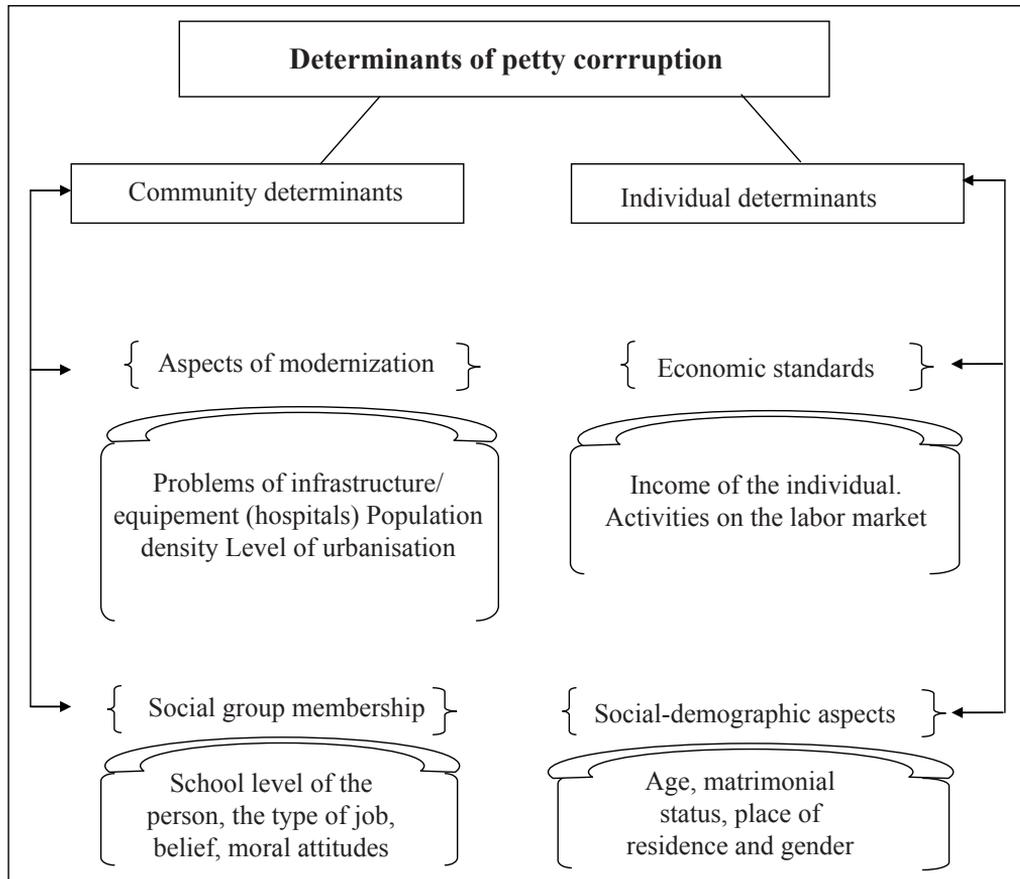
About income, most studies suggest that wealth or individuals' income is an important determinant of exposure to corruption. In other words, a person is more confronted with corruption when he/she is rich (Kaufman and Wei, 1999; Lui, 1985; Hunt and Lazlo, 2007).

Another widely held view is that women are less tolerant to this vice than men (Dollar et al, 2001). This view implies that women in power are more favorable to decisions aimed at improving well-being and development. It is therefore interesting to determine whether the differentiation in the payment of bribes is important between women and men. Moreover, the decision to take bribe sometimes depends on age. The older are less victims of the phenomenon because they have had time to build up a "solidarity network". Reciprocal exchanges allow them to avoid corrupt practices. It is not the same

case for young people who rather seek to settle in life and who are more in touch with the administration.

Figure 1 summarizes the determinants of petty corruption, and informs us about the type of model we will build to find the determinants of petty corruption in public hospitals of Douala in Cameroon.

**Figure 1: Determinants of petty corruption**



Source: Timnou and Feunon (2012)

## Methodology

First of all, we will determine the number of users to interview for all hospitals retained in the study and even per hospital.

Secondly, from the questions asked, we will present the variables used in the study and proposed by the theoretical model;

Thirdly, starting from the same questionnaire, we will describe the process of calculating the prevalence rates and that of identifying the most corrupt services;

Finally, we will unveil the evaluation approach of the determinants of users' exposure to corruption.

## Sample

This study mobilizes the data of the survey conducted in 2009 among users of nine public hospitals: Deido, Logbaba, Palmiers, New-Bell, Bonamoussadi, Bonassama, Nylon, General, and Laquintinie hospitals. The first seven are district hospitals and the last two are referral hospitals. Three reasons led us to choose these hospitals: The first is that they are located in a small space, that is, the Douala metropolis. As a matter of fact, according to the 2008/2009 statistical directory of the Ministry of Health, this city records a significant number of public health facilities. It is, therefore, inexpensive for research teams to roam these health formations repeatedly. The second reason is that each hospital must have a minimum of resources, at least six physicians, 52 nurses and 50 beds, allowing it to pursue its mission. The third is that, as we study petty corruption which is practised in medical services, it was necessary to ensure that these hospitals, where the study is carried out, actually have cases of corruption. A preliminary investigation allowed us to retain eight services: surgery, emergency, reception, medical certificate, consultation, maternity, hospitalization and drugstore. We assume that the services rendered in these hospitals are identical. From this point of view, these hospitals are relatively homogeneous. But this homogeneity is limited insofar as the General and the Laquintinie hospitals have skilled health personnel and modern medical equipment which are not always found in district hospitals. They can, therefore, refer to the first two for serious diseases. Certainly in Douala, there are other public health facilities like the borough medical centres or the integrated health centres. But these centres were not selected because they do not have some of the eight medical services identified above.

But, since the sample of the nine hospitals we studied excluded some types of hospitals in Cameroon, including rural hospitals, our results cannot be generalized nationally. Indeed, nothing suggests that our results would be valid for the entire Cameroon. However, despite this limitation, corruption analysis in selected hospitals remains important because it is a virgin field in the empirical literature on the issue.

Moreover, as we were unable to determine an approximate P value through a prior survey (because to our knowledge, no investigation about corruption in public hospitals has yet been carried out in Cameroon), that is to say, the proportion P of respondents in the context of a preliminary study, we set P to 0.5, this value representing the worst case, that is to say, the value which gives the greatest possible standard deviation for the sampling distribution of  $\bar{P}$ . In this case, the required sample size to ensure an error margin E (in absolute value) not exceeding 5% with a confidence level of 95% will be about<sup>6</sup>:

$$n = \frac{Z_{\alpha/2}^2 \times (0,5) (0,5)}{4E^2} = \frac{(1,96)^2}{4 \times (0,05)^2} \approx 384$$

Where,

E The error margin,

- $Z$  The standard normal distribution,  
 $\bar{P}$  The estimator of P in the preliminary study.

The distribution of the number of individuals to be interviewed is done from the number of medical and paramedical staff in each hospital selected as shown in Table 1.

**Table 1: Distribution of the number of patients to interview per hospital**

Hospital	Personnel Number	Hospital Importance (In %)	Number of Users to Interview (Y <sup>T</sup> )
Laquintinie	630	41	157
General	326	21	81
New-Bell	113	7	27
Bonassama	103	7	25
Palmiers	100	6	25
Deido	84	5	21
Logbaba	80	5	20
Nylon	62	4	15
Bonamoussadi	57	4	14
Total	1,555	100	384

Source: Our estimates based on information collected at the Regional Health Delegation Littoral on the number of hospitals

The first column describes the type of hospital, the second column the total number of medical and paramedical staff, the third indicates the weight or importance of the personnel of each hospital as compared to the staff of all hospitals in general, and the last column, the approximate number of people who should be interviewed by hospital, based on the weight of each hospital. We came up with a total of 384 interviewees. For prudence sake, we distributed 415 questionnaires with the assumption that all incorrectly completed questionnaires would be eliminated to help approximately achieve the sample's size. Thus, 407 questionnaires were filled out correctly and therefore validated.

## Study variables

These questionnaires contain variables related to corruption and variables related to the identities of individuals being interviewed. However, information about the functioning of hospitals can also contribute to determine corrupt practices. The first and second variables which are endogenous and exogenous respectively will then be used in the estimation strategy. Furthermore, the information on the functioning of hospitals may also help us to explain this phenomenon in a descriptive manner.

### Endogenous variables

Endogenous variables are linked to corruption. During the survey, each respondent was asked to give his/her opinion on the assertions that have been made about the conditions that medical doctors require from patients who want access to health care in the public

hospital he/she frequents. To achieve this goal, the Likert scale was used to allow each respondent to have five possible answers: not at all agree, not agree, indifferent, agree, and strongly agree. The claims arising from abuses through bribes:

- a) The patient who wants to be consulted, pay official fees plus the bribe;
- b) For a medical certificate, the patient pays official fees plus the bribe;
- c) For surgery, the patient pays official fees plus the bribe;
- d) To deliver a baby, a woman pays official fees plus the bribe;
- e) For proper follow up, the patient pays official fees plus the bribe;
- f) For emergency care, the patient pays more than the official fees plus the bribe.

The claims about abuses that occur without bribes:

- a) The medical doctors invite patients to receive treatment in their formal/informal private clinics.
- b) Medical doctors (nurses) sell drugs to patients for their own benefit.

These questions are interesting for at least three reasons: first, they are contextual because they describe the behaviour of individuals in a certain number of "experimental" situations. Then, this type of indirect questions is considered in the literature as more reliable than more direct questions (for example: "have you paid a bribe in addition to official fees to have access to health care?") which are likely to induce a systematic bias insofar as they highlight the responsibility of the respondent. Finally, we used a conservative definition of corruption ("offering a bribe") in the first six questions. On the contrary, in the last two questions, corruption appears to be a misuse of the State property, which can either emanate from users or from the sale of state drugs. This diversion appears as an attempt to privatize public services.

### Exogenous variables

They are linked to the users' characteristics highlighted in the questionnaire:

- a) What is your age?
- b) What sex are you?
- c) What is your educational level?
- d) What is your marital status?
- e) What is the level of your monthly income?

### 3. Variables related to hospitals' functioning

- a) Number of patients per doctor;
- b) Number of patients per bed;
- c) Number of patients per hospital.

## Corruption measurement and identification of the most corrupt services

In general, it is known that the different services in these hospitals are prone to corruption. However, the most corrupt is unknown. To identify it, we need to use a measurement tool.

### Corruption measurement

The questionnaire on corruption also measures the phenomenon in each of these eight services: consultation, reception, surgery, maternity, hospitalization, drugstore, medical certificate and emergency. For this purpose, we still use the Likert scale, and in particular, the opinions given by respondents across the five possible answers were: not at all agree, disagree, indifferent, agree and strongly agree. We assign each of these response options mentioned above, a score  $n_i$  which indicates the level of corruption. The  $n_i$  ranges from 1 to 5. For example:

- If  $i = 1$ , the level of corruption is  $n_i = n_1 = 1$ . This is the lowest score corresponding to the view that the respondent does not at all agree that corruption is practised in the service of the hospital he/she frequents.
- If  $i = 5$ , the level of corruption is  $n_i = n_5 = 5$ . This is the highest score corresponding to the view that the respondent does agree strongly that corruption is practiced in the hospital service he/she frequents.

On this scale, when we go from  $n_1 = 1$  to  $n_5 = 5$ , the level of corruption increases. At the end of the investigation, we will count the number ( $f_i$ ) of respondents who have chosen the level of corruption  $n_p$ , related to each hospital. Thus, we will find in each of the eight services of each hospital, the prevalence of corruption which equals  $\sum_{i=1}^{n_i} f_i n_i$ .

### Identification of the most corrupt services

For each service, we will calculate the average of corruption prevalence rate in relation to all hospitals. On this basis, we will calculate the average of the averages of the corruption prevalence rates of different services. Corruption levels will be considered significant from the time the average prevalence rate of a service will be higher than the average of the averages of the prevalence rates.

### The estimation model

We have to make a bivariate analysis between the level of corruption in each selected service and individuals' characteristics.

We have, as far as corruption is concerned in any given medical service, highlighted

the determinants of the users' exposure to corruption through an estimate by odds ratios. Thus, the age, income, educational level and gender variables were used to determine the profile of individuals who are victims of corruption in a particular service and hospital. The estimates by odds ratios were apprehended through the construction of contingency 2 x 2 tables (Table 2).

**Table 2: Joint distributions**

Determinants of users' exposure	Has been a victim of corruption in a particular service	
	No	Yes
Determinant 1	$N_{11}$	$N_{12}$
Determinant 2	$N_{21}$	$N_{22}$

Sources: The author's conception

Where,  $N_{11}$  and  $N_{21}$  represent the number of persons of determinants 1 and 2 who have not been victims of corruption in a particular service;  $N_{12}$  and  $N_{22}$  being respectively the number of persons of determinants 1 and 2 who have been victims of corruption. These various joint distributions  $N_{ij}$  were used to calculate the following odds ratios:

$$\theta = (N_{11}N_{22}) / (N_{12}N_{21})$$

Thus, when  $1 < \theta < \infty$ , we will say that the individuals of determinant 1 will tend not to be less victims (or to be more victims) of corruption in a particular service than those of determinant 2. On the contrary,  $0 < \theta < 1$  will produce the opposite effect. The level of corruption of the successful medical service can thus be highlighted through four sub-contingency tables of 2x2 dimensions, representing the above different identified variables (age, income, educational level and gender).

## 4. Results and discussion

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These results cover a few descriptive statistics, the model's estimates and discussion.

### Descriptive statistics

These relate to the characteristics of the sample of users surveyed, the magnitude of corrupt practices in the most corrupt services, and the obstacles to the functioning of hospitals from which corruption originated.

### Characteristics of the sample

Table 3 specifies the characteristics of the users' sample: age, educational level, income, marital and employment status.

As far as age characteristic is concerned, it was split into two categories: young people between 20 and 40 years old, and those more than 40 years old. This nomenclature at the age level reflects the country's socio-economic situation as concerns employment insofar as three years ago, the authorities launched a recruitment campaign in the public sector (25,000 in total), considering that any person younger is aged 40 and below. The income characteristic also obeys this dualistic nomenclature, namely, those with an income of 250,000 FCFA and less, and those who earn more than 250,000 FCFA. This classification took into account the socio-economic characteristics of the respondents<sup>8</sup>. This choice is justified by the fact that initially, we considered four classes of income, namely less than 75,000 FCFA between 75,000-150,000 FCFA from 150,000-250,000 FCFA and more than 250,000 FCFA. This indicates that among the 407 respondents, almost 83% have an income of 250,000 FCFA and less, and only about 17% earn more than 250,000 FCFA. The latter percentage mostly represents senior staff in companies and businessmen / contractors who are regarded in the Cameroonian environment as being part of the richest social class. About 80% of the first quoted earn more than 250,000, and nearly 50% in the second category the same thing, hence the justification of the nomenclature at the income distribution of the two categories, that is 250,000 FCFA and under, and more than 250,000. This is also applied to the education variable, where two categories were selected: higher level and no higher level.

**Table 3: The characteristics of the users' sample**

	Male	Female	Total	% Male	% Female	Total %
<b>Age</b>						
40 years old and less	134	190	324	41.4	58.6	100
More than 40 years old	52	31	83	62.7	37.3	100
<b>Education</b>						
Primary and Secondary Education	97	145	242	40.1	59.2	100
Higher Education	89	76	165	53.9	46.1	100
<b>Average Monthly Income</b>						
Less than 75,000 FCFA	78	106	184	42.4	57.6	100
Between 75,000 and 150,000	48	52	100	48	52	100
Between 150,000 and 250,000	26	28	54	48	52	100
More than 250,000	35	34	69	50.7	49.3	100
<b>Marital Status</b>						
Married	72	99	171	42.1	57.9	100
Single	74	82	156	47.4	52.6	100
Divorced	10	9	19	52.6	47.4	100
Others	30	31	61	49.2	50.8	100
<b>Socio-Professional Category</b>						
Senior Staff	17	7	24	70.8	29.2	100
Control Agent	21	14	35	60	40	100
Enforcement Officer	22	15	37	59.5	40.5	100
Contractor (Business men)	25	4	29	86.2	13.8	100
Housewives		55	55		100	100
Trader	25	42	67	37.3	62.7	100
Unemployed	30	29	59	50.8	49.2	100
Others (informal)	46	55	101	45.5	54.5	100
Total	186	221	407	45.7	54.3	100

Sources: Author

## Magnitude of corruption in hospitals' services

As part of the survey the National Institute of Statistics conducted in 2007 among households in Cameroon, 13 sectors were selected as the most corrupt in the country. According to this investigation, the police ranked first, the gendarmerie second, education and health seven and eight respectively. This ranking coincides somewhat with the one that Transparency International proposed in 2006 (Transparency International, 2006) on the basis of the 20 most affected sectors by this phenomenon, and where health ranked ninth. The survey of users of public hospitals in Douala in 2009 has allowed measuring the prevalence of corrupt practices in the eight selected services as indicated in Table 4.

The last line of Table 4 represents the average prevalence rates calculated for each service for all hospitals in general.

All figures in bold represent the hospital services where the level of prevalence rates is significant<sup>9</sup>, and it is only for the latter that the determinants of corruption will be highlighted. It appears that the reception service from which the nursing staff divert patients, is the most affected (with a prevalence rate of 82.02%), compared with other

services. It is followed by the drugstore service (70.18), hospitalization service (58.48) and that of medical certificate (56.16).

**Table 4: The prevalence rate of corruption in public hospitals**

Form of corruption	Consultation	Drugs	Medical Certificate	Surgery	Delivery	Hospitalization	Emergency	Diversi- on
<b>Hospitals</b>								
General	20.5	51.2	32.1	25	9.5	39.3	27.4	76.2
Laquintinie	76.5	90.2	76.1	71.6	72.4	84	69.3	92
Logbaba	19	52.4	42.9	14.3	14.3	38.1	19	81
Deido	81.8	100	90.9	81.8	95.5	100	68.2	100
Bonamoussadi	64.3	92.9	57.1	21.4	42.9	42.9	7.1	100
Bonassama	42.4	60.6	54.5	37.5	36.4	53.1	30.1	78.8
Palmier	52	80.8	76.9	52	53.8	65.4	53.8	92,3
Nylon	12.5	50	25	31.3	31.3	25	6.3	25
New-Bell	39.3	53,6	50	42.9	42.9	78.6	32.1	92.9
Average	45.36	70.18	56.16	41,97	44.33	58.48	34.81	82.02

Source: Author

Taking into account the medical certificate service and that of hospitalization, where corrupt practices are followed by bribes, we get Table 5.

**Table 5: Corruption assessment in medical certificate and hospitalization services according to the determining variable**

	Users	Corruption when issuing medical certificate		Corruption at hospitalization	
		Yes	No	Yes	No
Age	40 years old and less	59	41	89.2	10.8
	Over 40 years old	63.9	36.1	86.7	13.3
Sex	Male	60.2	39.8	86.6	13.4
	Female	59.7	40.3	90.5	9.5
Income	250,000 and less	60.1	39.9	88	12
	250, 000 and above	59.1	40,9	92.4	7.6
Education	Not Superior	62.4	37.6	91.3	8.7
	Superior	56.4	43.6	84.8	15.2

Source : Our survey

Table 5 shows that compared with the medical certificate and in relation to all determinants (age, income, gender and education), the most affected users (63.9%) are those who are aged over 40 years, while the least affected (56.4%) are the more educated. However, when we go from one determinant to another, it follows that users aged 40 and below are less affected (63.9%) than those aged over 40 (60.2%), men are more vulnerable (60.2%) than women (59.2%), holders of income of 250,000 FCFA and less (60.1%) than those with incomes of more than 250,000 FCFA (59.1% ) and the less educated users (62.4%) than those with high school level (56.4%).

Compared with hospitalization and all determinants (age, income, education and gender), the least affected users are more educated (84.8%) and holders of income of over 250,000 FCFA more affected (92.4%). The analysis of a key determinant shows that users aged 40 and below are more affected (89.2%) than those aged over 40 years (86.7%). Women (90.5%) are more affected than men (86.6%), holders of more than 250,000 FCFA (92.4%) more than those with 250,000 FCFA and less (88%) and the less educated (91.3%) more than the better educated (84.8%).

If we take into account the reception service and that of drugs, where users suffer illegal sales within the hospital (drugs) or outside (reception service), we see the magnitude of these abuses from Table 6:

**Table 6: Magnitude of corruption at the reception service and that of drugs according to the determining variable**

	Users	Corruption on drugs		Corruption at the reception	
		Yes	No	Yes	No
Age	40 years old and less	91.7	8.3	63.5	36.5
	over 40 years old	92.8	7.3	60.3	39.7
Sex	Male	91.4	8.6	63.24	36.76
	Female	92.3	7.7	61.91	38.19
Income	250,000 and less	91.5	8.5	68.93	31.07
	250,000 and above	93.9	6.1	60.69	39.4
Education	Not Superior	92.6	7.4	80.30	19.7
	Superior	90.9	9.1	75.6	24.4

Source: Author

Compared with the reception service, if we take into account all determinants (age, income, gender and education), the least educated users are the most affected (80.30%) by corruption, and those over 40 years old the least affected (60.3%). However, from one determinant to another, it happens that the 40 years old and below are more affected (63.5%) than those over 40 years old (60.3%), the men more affected (63.24%) than the women (61.91), holders of income over 250,000 FCFA less affected (60.69%) than holders of income of 250,000 FCFA and less (68.93%) and finally, the least educated more affected (80.30%) than the most educated (75.6%).

When we take into account all the determinants as far as corruption on drugs is concerned, users who have incomes over 250,000 FCFA are the most affected (93.9%), while the most educated are the least affected (90.9%). When we go from one determinant to another, it happens that those over 40 years are the most affected (92.8%) than those aged 40 years and under (91.7%), the women most affected (92.3%) than men (91.4%), the most educated (92.6%) most affected than the least educated (90.9%) and finally, holders of income over 250,000 FCFA most affected (93.9%) than holders of income of 250,000 FCFA and less (91.5%).

## Obstacles to the functioning of hospitals from which corruption originated

The shortage of medical staff and hospital equipment can be the source of corrupt practices as indicated in Table 7.

**Table 7: The allocations of public hospitals in Douala by medical staff and hospital equipment**

Hospital's name	Number of medical doctors	Number of beds	Population per doctor	Population per bed
Nylon Hospital	07	70	22 744	2 274
Logbaba Hospital	06	42	26 535	3 790
Bonassama Hospital	09	80	17 690	1 990
New-Bell Hospital	09	48	17 690	3 316
Palmiers Hospital	07	41	22 744	3 883
Bonamoussadi Hospital	07	75	22 744	2 122
Deido Hospital	08	57	19 901	2 793
Laquintinie Hospital	125	1100	1 273	144
General Hospital	60	300	2 653	530
Total	238	1813	17 108	2 315

Sources: Regional Delegation of Health, Littoral. The last two columns were calculated by the author based on the average population per hospital, 159,211 inhabitants, according to National Institute of Statistics [INS], (2010).

Considering that the average population per hospital is 159,211, as estimated by the Cameroon National Institute of Statistics in 2009, Table 7 shows that, in general, the number of inhabitants per medical doctor is 17,108, while the World Health Organization standard is 10,000. Therefore, reception halls are full of patients asking for medical doctors' services in vain. Also, some of these patients are willing to pay bribes for privileged access (Cartier Bresson, 1998).

The increase in the number of formal and informal private health facilities, which supplement public authorities in the provision of health services, can contribute to reducing the deficit of medical personnel in the city of Douala, if these health centres recruit and employ their own medical doctors. Unfortunately, most of these health centres have, as promoters, the medical doctors working in public hospitals. They receive patients in public hospitals and direct them to private clinics for their personal gain. Also, many patients are dissatisfied with the service provided in public hospitals because of the poor reception they are given.

One of the problems that undermine the proper functioning of public hospitals in Douala is inadequate sanitation and lack of maintenance. For example, Table 7 shows that the ratio of inhabitants to a hospital bed at 2,315 people per bed is high. This number indicates the low hospitalization capacity in these hospitals, given the high demand for health care. According to estimates provided by the Cameroon National Institute of Statistics, each district hospital receives, on average, 27 patients per day, including

22 in consultation and seven in hospitalization (National Institute of Statistics, 2010). Therefore, some patients are willing to pay bribe to receive privileged access for a bed.

## The model's estimates

Table 7 (on corruption prevalence rates) identifies the four most corrupt medical services in all hospitals: these are the reception, hospitalization, medical certificate and selling of drugs. The estimates of the determinants of corruption at the users' level in the reception service and that of medical certificate are presented in the two tables in Appendix 2, with their corresponding confidence intervals.

The tables in Appendix 2 highlight the profiles of users most exposed to corruption at the reception service, and that of the medical certificate in each of the public hospitals in the city of Douala, and for all hospitals in general. Thus, for each of the determinants studied, an odds ratio  $\hat{\theta} > 1$  will simply imply that in relation to gender, men tend to be more exposed to corruption than women, people with low income more vulnerable than people with high income for the income variable, those without a university level more vulnerable than those who have it for the educational level variable, and finally the younger more vulnerable than the older for the age variable. An odds ratio of  $\hat{\theta} > 1$  will of course have the opposite effect. An estimate for all hospitals for victims of corruption through diversion related to the sex determinant shows that men as much as women are victims at the same level ( $\hat{\theta}_{SD1} = 1$ ). The same estimate for the income determinant shows that people with higher income are about 10% more likely ( $\hat{\theta}_{RD} = 1.10$ ) than low-income people to be diverted. On the contrary, the education level and age determinants reveal that those without a university education are most often diverted than those who have it. It is the same with the younger as compared to the older, the first with 22% more likely than the latter to be diverted. An estimate of corruption determinants when issuing medical certificate for all hospitals reveals that in general, men are more vulnerable than women; on the contrary, those with a higher income are 24% more likely to be exposed than those with lower income. However, our estimates show that the least educated and the older are more presented as the most exposed to this type of corruption (Yamb et al, 2015)

We can, therefore, in light of the previous analyses and the above various estimate odds ratios tables, identify simultaneously and specifically, the hospitals based on the determinants of different corruption practices (Table 8 and 9).

At the General Hospital, for example, we will say that the determinants of corruption at reception service are most often male ( $M_1$ ); they have a monthly income of 250,000 FCFA and less ( $M_2$ ), they have on education below the higher education ( $P_2$ ), and they are mostly 40 years old and below ( $M_3$ ); similarly, compared with age, for example, we will simply say that in about over 66% of cases, it is the 40 years old and above who are victims of diversion in hospitals.

**Table 8: Determinants of corruption at the reception service in a given hospital**

Hospital	Sex	Income	School Level	Age
	Male (M <sub>1</sub> ) Female (F)	Less than 250,000 (M <sub>2</sub> ) More than 250,000 (P <sub>1</sub> )	Not superior (P <sub>2</sub> ) Superior (S)	Less than 40 years old (M <sub>3</sub> ) Above 40 years old (P <sub>3</sub> )
General	M <sub>1</sub>	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
Laquintinie	F	P <sub>1</sub>	S	P <sub>3</sub>
Logbaba	M <sub>1</sub> et F	P <sub>1</sub>	S	M <sub>3</sub>
Deido	F	P <sub>1</sub>	S	P <sub>3</sub>
Bonamoussadi	M <sub>1</sub>	M <sub>2</sub> et P	S	P <sub>3</sub>
Bonassama	M <sub>1</sub>	P <sub>1</sub>	P2 et S	P <sub>3</sub>
Palmiers	F	M <sub>2</sub>	P <sub>2</sub>	P <sub>3</sub>
Nylon	F	M <sub>2</sub>	P <sub>2</sub>	P <sub>3</sub>
New- Bell	M <sub>1</sub>	M <sub>2</sub>	S	M <sub>3</sub>
All hospitals	M <sub>1</sub> et F	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>

Sources: Yamb and Bayemi, 2015

**Table 9: Determinants of corruption at the medical certificate service in a given hospital**

Hospital	Sex	Income	School Level	Age
	Male (M <sub>1</sub> ) Female (F)	Less than 250,000 (M <sub>2</sub> ) More than 250,000 (P <sub>1</sub> )	Not superior (P <sub>2</sub> ) Superior (S)	Less than 40 years old (M <sub>3</sub> ) Above 40 years old (P <sub>3</sub> )
General	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
Laquintinie	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
Logbaba	F	P <sub>1</sub>	S	M <sub>3</sub>
Deido	M <sub>1</sub>	M <sub>2</sub>	S	P <sub>3</sub>
Bonamoussadi	M <sub>1</sub>	P <sub>2</sub>	P <sub>2</sub>	P <sub>3</sub>
Bonassama	M <sub>1</sub>	M <sub>2</sub>	P <sub>2</sub>	P <sub>3</sub>
Palmiers	F	M <sub>2</sub>	S	M <sub>3</sub>
Nylon	F	P <sub>1</sub>	S	P <sub>3</sub>
New- Bell	M <sub>1</sub>	M <sub>2</sub> and et P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
All hospitals	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>

Sources: Yamb and Bayemi, 2015

We say as before that at the Laquintinie hospital, for example, corruption when issuing medical certificate is determined by men and those with an income of more than 250,000 FCFA. However, for the majority of users, the education level below university and age over 40 years are the most prominent determinants. As far as sex is concerned, it can be noted, for example, that in over 66% of cases, it is the men who are more vulnerable to corruption when issuing medical certificate.

Finally, for drugs service and hospitalization, the estimated odds ratios and their respective confidence intervals are presented in the two tables in Appendix 3.

We note that for each of the determinants studied, an odds ratio  $\hat{\theta} > 1$  implies that in relation to sex, men tend to be more exposed than women; low-income people more exposed than people with high income for the income variable; those without a university level more vulnerable than those having it for the school level variable, and finally the younger people more victims than the older for the age variable. An odds ratio  $\hat{\theta} > 1$  will therefore have the opposite effect. An estimate for all hospitals in general for victims of

corruption through the sale of drugs for the sex determinant shows that both men and women are victims at the same level ( $\hat{\theta}_{SD} = 1$ ). However, income, school level and age determinants reveal that low-income people are more exposed than people with higher incomes, those without a university level more vulnerable than those who have it, and finally the younger people more victims than the older. An estimate for all hospitals for victims of corruption through hospitalization reveals that in general, men are less victims than women, and low-income people less vulnerable than those with high incomes (the odds ratios here are superior to 1). With odds ratios inferior to 1 for the university level and age determinants, it is concluded that corruption through hospitalization most affects those who don't have a university level and the younger respectively (Yamb and Bayemi, 2015).

Tables 10 and 11 help, simultaneously and specifically, identify hospitals based on the determinants of corruption through the sale of drugs:

**Table 10: Determinants of corruption through the sale of drugs in a given hospital**

Hospital	Sex	Income	School Level	Age
	Male (M <sub>1</sub> ) Female (F)	Less than 250,000 (M <sub>2</sub> ) More than 250,000 (P <sub>1</sub> )	Not superior (P <sub>2</sub> ) Superior (S)	Less than 40 years old (M <sub>3</sub> ) Above 40 years old (P <sub>3</sub> )
General	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
Laquintinie	M <sub>1</sub>	M <sub>2</sub>	P <sub>2</sub>	P <sub>3</sub>
Logbaba	F	P <sub>1</sub>	P <sub>2</sub>	M <sub>3</sub>
Deido	M <sub>1</sub>	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
Bonamoussadi	M <sub>1</sub>	M <sub>2</sub> and P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub> and M <sub>3</sub>
Bonassama	M <sub>1</sub>	M <sub>2</sub>	P <sub>2</sub>	P <sub>3</sub>
Palmiers	F	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
Nylon	F	M <sub>2</sub>	P <sub>2</sub>	P <sub>3</sub> and M <sub>3</sub>
New- Bell	F	P <sub>1</sub>	S	M <sub>3</sub>
All hospitals	M1 and F	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>

Sources: Yamb and Bayemi (2015).

We note that in all hospitals, the determinants of the phenomenon in relation to drugs are both men and women, holders of income of over 250,000 FCFA, those with or without university education and finally, those aged 40 and below. These determinants vary when we go from one hospital to another. For example, at the Deido hospital, these are the women, the holders of income of 250,000 FCFA and less, those with the education below university and finally, those aged 40 years and below.

**Table 11: Determinants of corruption at the hospitalization service in a given hospital**

Hospital	Sex	Income	School Level	Age
	Male (M <sub>1</sub> ) Female (F)	Less than 250,000 (M <sub>2</sub> ) More than 250,000 (P <sub>1</sub> )	Not superior (P <sub>2</sub> ) Superior (S)	Less than 40 years old (M <sub>3</sub> ) Above 40 years old (P <sub>3</sub> )
General	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
Laquintinie	M <sub>1</sub>	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
Logbaba	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	M <sub>3</sub> and P <sub>3</sub>
Deido	F	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
Bonamoussadi	F	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>

*continued next page*

**Table 11 Continued**

Hospital	Sex	Income	School Level	Age
	Male (M <sub>1</sub> ) Female (F)	Less than 250,000 (M <sub>2</sub> ) More than 250,000 (P <sub>1</sub> )	Not superior (P <sub>2</sub> ) Superior (S)	Less than 40 years old (M <sub>3</sub> ) Above 40 years old (P <sub>3</sub> )
Bonassama	F	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
Palmiers	M <sub>1</sub>	M <sub>2</sub> and P <sub>1</sub>	S	M <sub>3</sub>
Nylon	F	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
New- Bell	M <sub>1</sub>	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
All hospitals	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	M <sub>3</sub>

Sources: Yamb and Bayemi, 2015

In general, corruption determinants through hospitalization are men, the holders of income of over 250,000 FCFA, those with education below university and those aged 40 and below. These determinants vary when we go from one hospital to another. For example, in the Palmiers and Bonamoussadi hospitals, these are the women, the holders of income of 250,000 FCFA and less, those with the education below university and finally, those aged 40 years and below.

## Discussion

Tables 8, 9, 10 and 11 reveal that both women and men, those aged 40 years and below, the holders of income over 250,000 FCFA as well as holders of income of 250,000 FCFA and less, and users with a university education or below, are all vulnerable to corrupt practices that occur in the hospitalization, reception, drugs and medical certificate services. In reality, no user is spared by this phenomenon. However, when taking into account the nomenclature of each determinant, the profiles of the most vulnerable users vary from one group of hospitals to another.

**Table 12: Users and hospitals when income is the corruption determinant at the reception service**

Determinant	Users	Hospitals
Income	250,000 and less (M <sub>2</sub> )	General, New-Bell, Nylon, Palmiers
Income	Over 250, 000 (P <sub>1</sub> )	Laquintinie, Deido, Logbaba, Bonassama
Income	M <sub>2</sub> and P <sub>1</sub>	Bonamoussadi
Income	P <sub>1</sub>	All hospitals

Sources: Our determinants of Table 8

Table 12 shows that, in all hospitals, users holding either more than 250,000 FCFA or 250,000 FCFA and less, are the most vulnerable. However, in the General, New Bell, Nylon and Palmiers hospitals, only holders of income of 250,000 FCFA and less are the most vulnerable, while holders of income over 250,000 FCFA are more vulnerable at the Deido, Laquintinie, Logbaba and Bonassama hospitals.

Furthermore, by changing the service and by setting the users' income levels, groups of hospitals where users are vulnerable vary.

**Table 13: Users and hospitals when income is the corruption determinant at hospitalization**

Determinant	Users	Hospitals
Income	250,000 and less ( $M_2$ )	Laquintinie, Deido, Nylon, New-Bell, Bonassama
Income	Over 250,000 ( $P_1$ )	General, Logbaba, Bonamoussadi
Income	$M_2$ and $P_1$	Palmiers
Income	$P_1$	All hospitals

Source: Our determinants in Table 11

Table 13 shows that, in all the hospitals, the most vulnerable users are those who have incomes of more than 250,000 ( $P_1$ ). This result confirms the theoretical analysis that a person is faced with corruption when he/she is rich (Kaufman and Wei, 1999; Lui, 1985; Hunt and Laszlo, 2007).

But in the five hospitals — Laquintinie, Deido, Nylon, New Bell and Bonassama — it is the less rich, the holders of income of 250,000 FCFA and less who are the most vulnerable. We can explain this by the health professionals' low wages. Indeed, when wages are very low, health professionals are tempted to collect bribes from all the sick people, wealthy or not, including those with whom they have built trust relationships. As a matter of fact, such bribes are socially acceptable and justified as a way to compensate public health professionals who are poorly paid. However, when they become "institutionalized," it creates a situation whereby the richest people are likely to get more attention than those who are poor and unable to pay bribes (Savedoff and Haussmann, 2006).

It can be observed in Table 13 that at the General, Bonamoussadi and Logbaba hospitals, the most vulnerable users are those who hold more than 250,000 FCFA. Yet, in Table 13, as far as corruption at the reception service is concerned, the most vulnerable users at the General hospital are holders of income of 250,000 FCFA and less. Clearly, in the same hospital, all users, wealthy or not, are among the most vulnerable. However, in the hospitalization and drugs services (Tables 10 and 11), it is observed that by setting the school level as a determinant of this phenomenon, it is the users with an educational level below university who are in general the most vulnerable except in the New-Bell hospital.

The fact that the most educated people are less victims of this phenomenon can be justified by the argument that they have a better knowledge of their rights and have the means to defend themselves. But this argument does not always hold insofar as health professionals can use the educational level as a proxy of the contributory capacity of those being administered (Lavallee et al, 2010).

Table 14 shows whether certain services are more corrupt than others.

**Table 14: Comparison of corruption determinants according to services for all hospitals.**

	Sex	Income	School level	Age
	Male (M <sub>1</sub> ) Female (F)	250.000 and under (M <sub>2</sub> ) over 250.000 (P <sub>1</sub> )	Not superior (P <sub>2</sub> ) Superior (S)	40 years and under (M <sub>3</sub> ) above 40 years (P <sub>3</sub> )
Reception	M <sub>1</sub> and F	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
Medical Certificate	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
Drugs	M <sub>1</sub> and F	M <sub>2</sub>	P <sub>2</sub>	M <sub>3</sub>
Hospitalization	M <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	M <sub>3</sub>

Source: Our corruption determinants of Tables 8, 9, 10, and 11.

Theoretically, women are less tolerant to corruption than men. But when one considers corruption prevailing in the reception service and in that of drugs, we realize that women are as much victims as men. This can be understood by the specificity of women's health. Indeed, the physical and psychological vulnerability of individuals is also seen in the literature as a factor favouring corruption (Lavallee et al, 2010). From this point of view, women have more frequent and specific needs than men as far as health is concerned (UNDP, 2011). The fact that diseases afflict most women than men explains why they are so vulnerable to corruption without forgetting that they are people in Africa who more often bring and assist patients in hospitals.

Table 14 above also shows that corruption determinants for all hospitals are different from one service to another (reception, medical certificate, hospitalization and drugs) except when you consider the level of education as a determinant. In this case, education below university is an important corruption determinant.

## 5. Conclusion

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The purpose of this study was to estimate the determinants of corruption among users of public hospitals in the city of Douala in Cameroon. We used odds ratios to identify the profiles of the most vulnerable users in the most corrupt services in these hospitals: the reception, hospitalization, medical certificate and drugs.

In the case of the reception service, it appears, relative to income, that users who have more than 250,000 FCFA monthly are the most affected in four hospitals: the Laquintinie, Logbaba, Deido and Bonassama; users who have a monthly income of 250,000 FCFA and under are the most vulnerable in four hospitals: the Palmiers, General, Nylon and New-Bell. Finally, at the Bonamoussadi hospital, all users are affected regardless of the income level. As for the second group of hospitals, this result goes against theoretical models (Kaufman and Wei, 1999; Lui, 1985) according to which civil servants target their patients according to their ability to pay. This argument implies that the rich should be those who are asked bribes the most.

Still in the reception service, it appears relative to gender, that women are more exposed to the phenomenon in four hospitals: the Laquintinie, Deido, Palmiers and Nylon. In contrast, men are more vulnerable in Bonassama, Bonamoussadi, General and New-Bell hospitals. At the Logbaba hospital, women and men experience the same level of vulnerability. This result rejects the commonly held belief that women are less prone to corruption than men. But this can be explained by the fact that women have specific and more frequent needs than men as far as health is concerned (UNDP, 2011).

Finally, the idea that women are less prone to corruption and that civil servants target patients who have a high ability to pay cannot be justified in some hospitals' services. Also, we must differentiate the measures to fight against corruption whether the theory is being justified or not. Let us consider the case where the rich are the most vulnerable to corruption. For example, at the Laquintinie, Logbaba, Deido and Bonassama hospitals, the most vulnerable users are holders of income above 250,000 FCFA. It is possible, in these hospitals, to create a double queue system at the reception service: a fast queue and expensive for the rich who value speed and are willing to pay, and a slow queue for others. The wealthy should move towards the fast queue. In this system, a part of payment related to speed could be used to reward medical doctors and nurses for their results (Paul, 1995). When such system is being implemented, it is important to make sure to hinder the bureaucrats to use their monopoly power to extract rents from a more increased amount (Rose-Ackerman, 1998). On the contrary, in the Palmiers, the General, the Nylon and New-Bell hospitals where the least fortunate are vulnerable to corruption, it does not seem expedient to create a double queue as in the previous case. It

is desirable to encourage health professionals to honestly serve their patients, by creating professional awards for those who show exemplary behaviours. The increase of awards reduces the attractiveness of bribes without doing away with them. It is appropriate to impose a sanctions regime. Sanctions must be related to marginal profits from bribes. This question can be resolved by the criminal law besides internal disciplinary processes. Therefore, the rewards must be accompanied by sanctions. Lastly, in the particular case of Bonamoussadi hospital where the wealthy and the poor users are all vulnerable, it is appropriate to apply, at the same time, the measures proposed for the two previous hospital groups.

Moreover, to craft appropriate measures against corruption in Cameroonian public hospitals, it is worth completing this study by other researches, by expanding the sample of users and hospitals. Indeed, it is possible that the determinants of corruption among users of urban public hospitals are different from those of rural public hospitals. Therefore, future studies should take into account the rural dimension.

# Notes

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1. The eight the Millennium Development Goals are: eradicate extreme poverty and hunger, achieving universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, fight against HIV / AIDS, malaria and other diseases, protect environment and develop a global partnership for development. This last objective includes the need to take measures that promote access to affordable drugs in developing countries.
2. Jenifer Hunt and Sonia Laszlo (2005) used this kind of data to study corrupt practices in the health sector in Peru and Uganda.
3. In some countries, bribes paid to access to health care are socially acceptable, and justified as away to compensate health workers who are poorly paid, and it is an understandable reaction from people who might be in urgent need of care. Thus, the social and cultural attitudes can be crucial on the perception that people have on corruption and even on the decision to pay or receive bribes. When such bribes become 'institutionalized', it creates a situation whereby rich people are likely to get more attention than those who are poor and unable to pay bribes (Savedoff and Hussmann, 2006).
4. This literature suggests that belonging to some religions is more conducive to the spread of corruption than others. In countries where religions called "hierarchical" as the Catholic, the Orthodox or the Muslim dominate, contestations towards authorities will be scarcer than in those where the dominant religion is more egalitarian and more individualistic, such as the Protestantism (Lavallee et al, 2010).
5. These programmes have led governments to compress their operating and investment expenses. The insistence through which the World Bank and the IMF have conditioned aid to a reduction of functioning expenditures of public administrations, unintentionally, sometimes contributed to the development of corruption (Rose-Ackerman, 1998).
6. Gérald Baillargeon, 1989. "Probabilités, Statistiques et Techniques de Régression, pp 256-257, les Editions SMG
7. To find Y, the number of individuals to be interviewed by hospital, we multiply the weight given to this hospital namely X by the total sample which is n. Therefore,  $Y = Xn$ . We assume that this weight depends on the size of the hospital's staff in such a way that the more the number of employees is higher, the better the hospital is important ( $X = \frac{\text{number of hospital's staff retained}}{\text{the total number of staff in all hospitals}}$ ).

8. In the Appendix, the table of income levels based on socio-professional categories is presented.
9. Corruption levels were considered significant in services, since the average prevalence rate of a service is higher than the average prevalence rate, which is 57.
10. Relationship between sex and diversion of patients in a given hospital.
11. Relationship between income and diversion of patients in a given hospital.
12. Relationship between school level and diversion of patients in a given hospital
13. Relationship between age and diversion of patients in a given hospital.
14. Relationship between sex and medical certificate in a given hospital.
15. Relationship between income and medical certificate in a given hospital.
16. Relationship between school level and medical certificate in a given hospital.
17. Relationship between age and medical certificate in a given hospital.
18. Relationship between sex and diversion of drugs in a given hospital.
19. Relationship between income and diversion of drugs in a given hospital.
20. Relationship between school Level and diversion of drugs in a given hospital.
21. Relationship between age and diversion of drugs in a given hospital.
22. Relationship between sex and corruption in hospitalization in a given hospital.
23. Relationship between income and corruption in hospitalization in a given hospital.
24. Relationship between school Level and corruption in hospitalization in a given hospital.
25. Relationship between age and corruption in hospitalization in a given hospital.

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# Appendix 1

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**Table 1A: Socio-professional category and level of household income**

		Level of household income				
		Less than 75,000	Between 75,000 and 150,000	Between 151,000 and 250,000	Above 250,000	Total
Socio-professional Category	Senior staff	0	2	3	19	24
	Control agent	0	8	16	11	35
	Enforcement officer	13	17	5	2	37
	Contractors (business men)	2	4	9	14	29
	Housewives	24	14	7	10	55
	Seller	25	29	7	6	67
	Unemployed	51	7	0	1	59
	Others (informal)	69	19	7	6	101

Total 184 100 54 69 407

# Appendix 2

**Table 2A: Corruption through diversion of patients: An estimate though odds ratios (reception service)**

Hospital	Sex		Income		School Level		Age	
	$\hat{\theta}_{SD/H^{10}}$	Confidence Interval to 95% of $\hat{\theta}_{SD/H}$	$\hat{\theta}_{RD/H^{11}}$	Confidence Interval to 95% of $\hat{\theta}_{RD/H}$	$\hat{\theta}_{ND/H^{12}}$	Confidence Interval to 95% of $\hat{\theta}_{ND/H}$	$\hat{\theta}_{AD/H^{13}}$	Confidence Interval to 95% of $\hat{\theta}_{AD/H}$
General	0.72	(0.28 ; 1.81)	0.75	(0.27 ; 2.11)	0.33	(0.13 ; 0.88)	0.91	(0.33 ; 2.47)
Laquintinie	1.09	(0.44 ; 2.66)	1.34	(0.41 ; 4.38)	1.05	(0.44 ; 2.50)	1.14	(0.39 ; 3.34)
Logbaba	1.0	(0.16 ; 6.25)	2.16	(0.11 ; 40.8)	1.87	(0.28 ; 12.4)	0.22	(0.01 ; 4.87)
Deido	1.42	(0.02 ; 78.1)	8.2	(0.13 ; 511.8)	2.53	(0.04 ; 141.9)	3.18	(0.05 ; 179.9)
Bonamoussadi	0.38	(0.01 ; 11.1)	1.0	(0.03 ; 30.6)	4.63	(0.15 ; 135.5)	1.0	(0.03 ; 30.6)
Bonassama	0.83	(0.20 ; 3.35)	2.9	(0.45 ; 18.7)	1.09	(0.27 ; 4.33)	8.5	(0.86 ; 83.5)
Palmiers	1.81	(0.27 ; 11.8)	0.88	(0.07 ; 10.3)	0.62	(0.05 ; 6.80)	17.7	(0.74 ; 426.4)
Nylon	8.07	(0.34 ; 187)	0.22	(0.003 ; 13.6)	0.60	(0.04 ; 9.15)	1.5	(0.05 ; 39.7)
New- Bell	0.88	(0.18 ; 4.37)	0.36	(0.01 ; 8.49)	1.07	(0.15 ; 7.30)	0.46	(0.04 ; 4.9)

Hospitals Estimate  $\hat{\theta}_{SD1} = 1.00$  (0.62 ; 1.62)  $\hat{\theta}_{RD} = 1.10$  (0.59 ; 2.07)  $\hat{\theta}_{ND} = 0.8$  (0.49 ; 1.34)  $\hat{\theta}_{AD} = 1.22$  (0.66 ; 2.24)

Source: Yamb and Bayemi(2015).

**Table 2B: Corruption when issuing medical certificate: An estimate through odds ratios (medical certificate service)**

Hospital	Sex		Income		School Level		Age	
	$\hat{\theta}_{SCM/H^{14}}$	Confidence Interval to 95% of $\hat{\theta}_{SCM/H}$	$\hat{\theta}_{RCM/H^{15}}$	Confidence Interval to 95% of $\hat{\theta}_{RCM/H}$	$\hat{\theta}_{NCM/H^{16}}$	Confidence Interval to 95% of $\hat{\theta}_{NCM/H}$	$\hat{\theta}_{ACM/H^{17}}$	Confidence Interval to 95% of $\hat{\theta}_{ACM/H}$
General	0.58	(0.23 ; 1.46)	1.28	(0.47;3.43)	0.54	(0.21;1.36)	1.5	(0.57 ; 3.98)
Laquintinie	0.95	(0.45 ; 2.00)	1.48	(0.47;4.68)	0.62	(0.30;1.27)	1.38	(0.52 ; 3.67)
Logbaba	4.9	(0.7 ; 34.3)	1.37	(0.07;25.4)	2.4	(0.37;15.31)	0.62	(0.047 ; 8.2)
Deido	0.11	(0.005 ; 2.6)	0.67	(0.025;18.5)	2.24	(0.09;53.5)	1.77	(0.07 ; 43.02)
Bonamoussadi	0.6	(0.07 ; 5.13)	1.67	(0.11;24.2)	0.6	(0.07;5.13)	1.67	(0.11 ; 24.25)
Bonassama	0.72	(0.18 ; 2.9)	0.8	(0.13;4.7)	0.55	(0.14;2.23)	1.85	(0.29 ; 11.90)
Palmiers	4.6	(0.66 ; 32.7)	0.88	(0.074;10.4)	4.61	(0.22;96.0)	0.26	(0.014 ; 4.98)
Nylon	1.4	(0.145 ; 13.5)	2.77	(0.047;161.9)	11	(0.81;147.8)	3.67	(0.17 ; 77.55)
New- Bell	0.41	(0.091 ; 1.9)	1.0	(0.056;17.7)	0.41	(0.06;2.76)	5.2	(0.50 ; 54.05)

Hospitals Estimate  $\hat{\theta}_{SCM} = 0.87$  (0.55 ; 1.36)  $\hat{\theta}_{RCM} = 1.24$  (0.68; 2.25)  $\hat{\theta}_{NCM} = 0.73$  (0.50; 1.21)  $\hat{\theta}_{ACM} = 1.5$  (0.85 ; 2.62)

Source: Yamb and Bayemi(2015).

# Appendix 3

**Table 3A: Corruption through diversion of drugs: An estimate through odds ratios**

Hospital	Sex		Income		School Level		Age	
	$\hat{\theta}_{SD/H}^{18}$	Confidence Interval to 95% of $\hat{\theta}_{SD/H}$	$\hat{\theta}_{RD/H}^{19}$	Confidence Interval to 95% of $\hat{\theta}_{RD/H}$	$\hat{\theta}_{ND/H}^{20}$	Confidence Interval to 95% of $\hat{\theta}_{ND/H}$	$\hat{\theta}_{AD/H}^{21}$	Confidence Interval to 95% of $\hat{\theta}_{AD/H}$
General	0.38	(0.09 ; 1.56)	1.15	(0.27 ; 4.74)	0.85	(0.23 ; 3.05)	2.20	(0.44 ; 11.00)
Laquintinie	0.30	(0.01 ; 6.40)	0.80	(0.03 ; 17.3)	0.80	(0.05 ; 13.16)	1.20	(0.05 ; 25.77)
Logbaba	6.25	(0.83 ; 46.5)	3.00	(0.12 ; 71.3)	0.53	(0.08 ; 3.54)	0.04	(0.002 ; 1.03)
Deido	0.70	(0.01 ; 36.6)	0.12	(0.002 ; 7.61)	0.39	(0.007 ; 22.0)	0.31	(0.005 ; 17.77)
Bonamoussadi	0.21	(0.007 ; 6.3)	1.0	(0.03 ; 30.6)	0.21	(0.007 ; 6.3)	1.0	(0.03 ; 30.61)
Bonassama	0.70	(0.08 ; 5.73)	0.62	(0.05 ; 7.31)	0.81	(0.10 ; 6.58)	2.48	(0.11 ; 52.46)
Palmiers	5.21	(0.19 ; 141)	0.62	(0.02 ; 18.0)	0.8	(0.02 ; 22.62)	0.32	(0.01 ; 10.11)
Nylon	5.00	(0.20 ; 122)	0.17	(0.002 ; 10.9)	0.27	(0.01 ; 5.76)	1.00	(0.03 ; 27.8)