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***SUPPLY-SIDE FACTORS AND INCIDENCE OF INFORMAL
PAYMENTS FOR HEALTH CARE:
THE CASE OF HIV-PATIENTS IN CAMEROON***

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Abstract

Direct out-of-pocket payments for health care continue to be a major source of health financing in low- and middle-income countries. Some of out-of-pocket expenditures take the form of “informal charges” or “illicit” fees paid by patients to access the needed health care services. Although several factors can explain at least some of the reasons for the presence of these payments (e.g., inefficiency, cronyism, corruption and the weak incentives and information), little is known about the extent to which these payments are exercised as well as their determinants in the context of Sub-Saharan Africa. This study relies on data from a nationally representative survey conducted among people living with HIV/AIDS in Cameroon with the aim of assessing their recent health care experiences including payments incurred during consultation and treatment. A multilevel mixed-effects logistic model is used to identify the supply-side factors that influence the incidence of these payments, while controlling for demand-side factors. About 3.05% of the surveyed patients paid an amount greater than the official consultation tariff. The average amount paid informally represented up to four times the official tariff. Factors related to (i) the management of human resources in the health facilities (implementation of task-shifting), (ii) health professionals’ perceptions with regard to the provision of HIV-care (fit between effort and compensation) and (iii) the management of the queue of patients (waiting time) significantly influence the probability of incurring an informal payment. Also, the type of health care facilities (public vs. private) is found to have a mitigated effect.

1. Introduction

Informal payments for health care are an important issue in analyzing health expenditure in low- and middle-income countries, since they can represent a significant financial burden for patients [1-4]. These payments are usually made by patients or their relatives for services that should be provided free-of-charge (within the public health care system) [8,9]. Informal payments can also be defined as any additional payments above the legally/officially stipulated tariffs [10-14]. These payments represent, therefore, undue extra costs on patients and their families when seeking health care. The weakness/absence of insurance mechanisms, the low and irregular remuneration of health personnel, the widespread corruption – both at local and central levels – and poor/lack of information on health care services and tariffs are all contextual factors favoring the existence of informal payments. It may be argued that patients can find some interests in paying informally – to

avoid queues, to receive better care and more attention, to get medications, etc. - and that the prospect of informal payments can motivate and retain staff in health facilities [15]. However, several recent studies suggested that informal payments can negatively affect quality, efficiency and equity of health care provision [1,12,15-18].

Previous literature on the determinants of informal payments for health care has mainly focused on patients' socio-economic characteristics with very few studies being conducted in Africa¹ [5,6]. As in the majority of Sub-Saharan African countries, the Cameroonian health system is affected by this problem of informal payments. Even if there is no published study on the frequency of informal payments for health care in Cameroon², the Transparency International's Global Corruption Barometer 2013 shows that 33% of people who had a contact with the health care system in the last 12 months reported having paid a bribe (against 24% in 2010/2011) and 61% of respondents felt that medical and health services were corrupt/extremely corrupt. The index of perception of corruption for medical services also remains high (3.6³) despite a downward trend (4.1 in 2006 and 3.9 in 2007) [19-22]. It is therefore necessary to identify factors on which policymakers can act to reduce the magnitude of this problem. In this quantitative study - which has the rare advantage of including determinants related to both patients and health facilities - we investigate how factors related to the management of health workforce, the facility ownership and the decentralization of HIV/care can influence the existence of under-the-table payments. To our knowledge, this is also the first study on informal payments for HIV-care. In the next section, we present a brief overview of the Cameroonian health system (with a focus on health financing, health workforce and HIV/AIDS), followed by the description of our methodology, the results, the discussion and the conclusion.

1. Overview of health financing, health workforce and HIV/AIDS in Cameroon

The financing of health in Cameroon is largely dependent on households and insurance-mechanisms are almost non-existent. Indeed, in 2009, out-of-pocket spending accounted for 70% of total health expenditure and it is estimated that in 2006, the existing micro-insurance programs were covering only about 1% of the population (World Bank, 2013). In addition, the use of public resources allocated to health is not efficient enough to meet the needs of populations. This results in significant disparities in health outcomes between regions,

¹ Existing empirical studies mostly cover countries in Central and Eastern Europe

² Information on informal payments for health care in Cameroon is available only in the grey literature constituted by reports from Transparency International [19-22] and National Institute of Statistics [34]

³ 1= not at all corrupt; 5= extremely corrupt

between rural and urban areas and between socioeconomic groups. The management of health workforce also reveals important disparities. Indeed, although Cameroon has a density of 1.9 doctors per 10,000 inhabitants (almost 2 times the level recommended by WHO), the distribution of health workforce in the country is quite unbalanced. There is a high concentration of health personnel in the major urban areas to the disadvantage of rural areas that are deserted, even though the needs are more important there. According to the 2011's Cameroon Health Workforce Census cited by the World Bank (2013), "half of Cameroon's health workforce is employed in three administrative regions: the Center, Littoral and the West, which are home to the three largest cities in Cameroon (Yaoundé, Douala, and Bafoussam). The Center Region (including Yaoundé), home to only 18 percent of the population, accounts for almost 40 percent of the physicians. On the other hand, the Far North, which is also home to 18 percent of the population, has only eight percent of physicians". Also, financial incentives and working conditions (infrastructure, equipment and materials, career development, etc.) are not always likely to motivate health workers nor to retain them in remote areas.

HIV/AIDS is a major health problem in Cameroon, since the country faces a generalized epidemic with a prevalence of 4.3% in the general population in 2011 [23]. The prevalence among women is 5.6% against 2.9% for men. Moreover, 58% of PLWHA are women and 16.6% are aged 15 to 24 years [23]. The various initiatives taken by the Government to fight against HIV/AIDS, including prevention of new infections and treatment of PLWHA, are based on the 3-levels pyramid structure (central, intermediate [regional] and peripheral [district]) of the health system, under the coordination of the National AIDS Control Committee and with an important support from external partners. Nonetheless, the fight against AIDS in Cameroon remains highly dependent on international funds which represent 63.7% of the total funding. In terms of results, during the period 2005 – 2011, the number of patients receiving ARTs increased from 17,156 to 105,653, reaching 49.6% of eligible patients [23]. This increasing trend is mainly due to the national policy promoting decentralization of HIV-care provision, favoring free access to ARTs and subsidizing certain laboratory tests. Indeed, the delivery of HIV-care has been decentralized from Accredited Treatment Centers (ATC) in central and regional hospitals to district hospital-level since 2005, while ARTs are provided free of charge since 2007 [24,25]. In 2011, a total of 155 health facilities (in 109 health districts) were offering health care services for PLWHA, with 6.2% of these treatment sites being run by religious entities. However, reports and patients'

testimonies published by Treatment Access Watch (TAW) show the widespread of informal payments for consultations and tests, posing additional financial burden on patients [26].

3. Materials and Methods

3.1. Data

The data used in this study are obtained from the “EVAL - ANRS 12 – 116” survey carried out from September 2006 to March 2007 in six provinces of Cameroon⁴. This survey included comprehensive data collected on patients, health facilities and health workers. A total of 3151 patients (response rate = 90.3%) aged 21 years or more with at least three months HIV-positive diagnosis⁵ were randomly selected in 27 public and private health facilities⁶. The survey design was made to insure the representativeness of the sample with respect to country’s cultural and socio-economic diversity and regional specificities in the prevalence of HIV/AIDS. Detailed information on patients’ characteristics was obtained from face-to-face interviews, clinical examination and retrospective medical files. Data on the 27 health facilities involved in the study were collected through interviews with the hospital staff, in situ observations, and cross-validation with data included in administrative reports. Data on characteristics and perception of working conditions of 97 physicians (response rate = 92%) in these facilities was collected through a self-administrated questionnaire.

3.2. Variables

Incidence and level of informal payments

To assess informal payments, we follow the approach which considers any additional payment above the tariff officially set as an informal payment [10-14]. Informal payment is, thus, defined – at the individual level – as the difference between the amount paid by the patient for consultation in the day of the interview and the official fees charged by the facility for adult consultation. This comparison of microdata from two sources – an official tariff collected at the level of the hospital and the amount actually paid by the patient – is a real strength of our study. First, considering the amount paid by patients for consultation on the day of the interview has the advantage of reducing bias due to recall period. Second, the comparison of the amount paid by the patient with the official tariff charged by the health facility provides a reliable measure of informal payments. Indeed, when it is directly asked to

⁴ See [24,27] for details on sampling and data collection

⁵ A total of 3488 eligible patients were randomly selected, 3170 agreed to participate and 3151 filled out the questionnaire

⁶ This includes 8 national ATCs in Yaoundé and Douala, 6 provincial ATCs and 13 district Management Units.

patients if they have made an informal payment, their answer is conditioned by the knowledge of the official price of the service they received, which may lead to an underestimation of the frequency and extent of informal payments. Also, as informal payments are potentially illicit, patients may be reluctant to declare the amounts paid [6,8,28,29]. This cross-checking method has already been used to assess informal payments for treatment of malaria in Nigeria [30].

The dependent variable used to study the incidence of informal payments for consultation is a dummy variable. It is equal to 1 if the amount paid by the patient is greater than the official tariff charged by the health facility, and 0 otherwise.

$$Y_{ij} = \begin{cases} 1 & \text{if } P_{ij} > T_j \\ 0 & \text{Otherwise} \end{cases} \quad (1)$$

where P_{ij} is the amount paid by patient i for a consultation in health facility j and T_j the official tariff charged by the facility j .

Considering $Y_{ij} = 1$, the amount of the informal payment (A_{ij}) is obtained as:

$$A_{ij} = P_{ij} - T_j \quad (2)$$

Patient characteristics

A set of patients' characteristics, which were shown [4,9-12,17] to explain the incidence of informal payments, are retained in our analysis. This includes: gender, age, education, employment status, place of residence, household income quintile, self-rated health status and whether the patient was under antiretroviral treatment or not.

Characteristics of health facilities

Two types of supply-side characteristics are retained. First, variables collected directly at the level of health facility: facility ownership (public vs. private) and whether task-shifting is implemented in the facility or not. Second, we used information collected among doctors and patients to build two variables at the level of each health facility. These include the percentage of doctors who consider that providing HIV-care is a difficult task which is not sufficiently remunerated and the percentage of patient whose waiting time was higher than one hour.

3.3. Statistical analysis

In order to take into account the structure of our data (patients nested in health facilities), a multilevel mixed-effects model is used to identify the factors associated with informal payments. Such econometric specification based on hierarchical modeling are suitable since it allows us to take into account the correlation between patients (level 1) within each health facility (level 2) [31,32]. Accordingly, the model can be specified for the incidence of informal payments as:

$$\text{logit}(\Pr(Y_{ij} = 1)) = \gamma_{00} + \sum_p \gamma_{p0} X_{p_{ij}} + \sum_q \gamma_{0q} Z_{qj} + \sum_p \sum_q \gamma_{pq} Z_{qj} X_{p_{ij}} + \sum_p u_{pj} X_{p_{ij}} + u_{0j} + e_{ij} \quad (3)$$

where X_p is the vector of patient-level explanatory variables, Z_q the vector of hospital-level explanatory variables, e_{ij} and u_{0j} the residuals at the individual and the group level respectively.

We follow the estimation procedure proposed by Hox [33,34]. This involves several steps. First, the null model is used to decompose the variance of Y into two independent components: the variance of the lowest-level errors (σ_e^2) and the variance of the highest-level errors ($\sigma_{u_0}^2$). From this model, we obtain the intra-class correlation defined as:

$$\rho = \frac{\sigma_{u_0}^2}{\sigma_{u_0}^2 + \sigma_e^2} \quad (4)$$

ρ indicates the proportion of the variance explained by the grouping structure in the sample. For a binary dependant variable estimated with a logistic model, we have $\sigma_e^2 = \frac{\pi^2}{3} \simeq 3.29$.

In the second step, the model is estimated for the whole patient-level explanatory variables mentioned above to control for patients' needs and socio-economic characteristics. The hospital-level explanatory variables are, then, included in the third step to assess their effects on informal payments in the model. The choice of to include all the variables in the final model regardless of their significance level departs from the standard procedure proposed by Hox. This strategy of estimation is advocated when little or no theory/evidence is available on the impact of each of which on the variable of interest [33]. The last steps involve testing whether any of the patient-level variables has a random slope variation and whether any of the

cross-level interactions⁷ is significant. The percentage of inter-groups variance explained by

the final model is obtained as [32]:
$$\frac{\sigma_{u_0}^2 (\text{Intercept-only model}) - \sigma_{u_0}^2 (\text{Full model})}{\sigma_{u_0}^2 (\text{Intercept-only model})}$$

4. Results

4.1. Descriptive statistics

A total of 1637 HIV-patients are included in this study. These are patients who were received at the hospital for a consultation with a doctor. Table 1 shows that women outnumber men (32.32%) in this sample, which mainly consists of patients living in urban areas (78.74%). About 67.68% of patients had a job, 74.10% were taking ARTs at the time of survey, and only 26.15% considered their health status as “poor”. The majority of patients got consultation in a public health facility (69.52%) and where task-shifting is practiced (75.69%).

The distribution of health facilities and patients according to the official fee charged is provided in Table 2. The official tariffs charged for a consultation by a doctor range from FCFA⁸ 0 (consultation is free of charge in 3 health facilities) to FCFA 3,000. A quarter of patients (n=415) got their consultation in 12 health facilities which charge the official tariff of FCFA 600. The incidence of informal payments in our sample is 3.05%, while the average amount paid informally is FCFA 2,277 (s.d =2,278). Table 1 also presents the incidence of informal payments and the average amount paid informally according to individual and group level characteristics. The incidence of informal payments incurred by HIV patients appears to be higher in private for-profit health facilities (11.82%) compared to public hospitals (2.99%) and private non-for-profit facilities (0.77%). Health facilities where no task-shifting from doctors to nurses is implemented are also more affected (5.03%). As far as individual factors are concerned, the incidence of informal payments is found to be particularly high amongst patients who are: not following ARTs (7.31%), in poor health (7.24%) and those belonging to the richest quintiles (respectively, 4.19% and 3.34% for the 4th and the 5th quintiles). The average amount paid informally by patients is found to be higher for those who: live in urban areas, are employed, with a poor self-rated health status and are not following ARTs. Also, patients who consulted in a health facility where task-shifting is not implemented paid an average amount which is 4.7 times higher compared with other patients. The average amount

⁷ Cross-level interactions capture the modification of the effect of an individual variable according to the characteristics of the hospital to which the patient belong to and vice versa [32].

⁸ 1US\$ = 492.6 FCFA (exchange rate at time of survey)

paid informally in private for-profit facilities is, respectively, 5 and 6 times higher than in public and private non for-profit hospitals.

The total amount of informal payments incurred by the affected patients (FCFA 113,850) represents about 78% of their total expenditure for consultation (Table 3a). This indicates the heavy financial burden that such additional illicit payments can have on PLWHA in Cameroon. Indeed, as shown in Table 3b, for 52% of affected patients, informal payments account for over 60% of the total amount paid for consultation. For 36% of patients, the whole amount paid for the consultation is found to be informal payment; these are patients who sought care in health facilities where HIV-consultation is supposed to be free of charge. Comparing the amount of informal payments with the official tariff charged (the ratio A_{ij}/T_j), the same conclusion arises. Indeed, in addition to those who are not supposed to pay any consultation fees, the (additional) informal payments made by 34% of patients is 1 to 4 times higher than the official tariff charged by the health facility. This shows that informal payments can constitute a financial barrier to accessing health care for HIV-patients in Cameroon, as already found elsewhere [35].

4.2. Modeling the probability of incurring informal payments

The results on the estimation of the effect of decentralization of HIV-care on the incidence of informal payments are presented in Table 4. First, the intra-class correlation coefficient obtained from the empty model (column I) shows that the grouping structure of data (patients nested in health facilities) explains 58% of the total variance of the dependant variable. This confirms the relevance of using multilevel mixed-effects models for our analysis. Second, in the model with only individual factors (column II), a lower probability of incurring an informal payment is significantly associated with age, a good self-rated health and antiretroviral therapy. Meanwhile, married patients seem to be more likely to make informal payments.

All the individual factors, irrespective of their significance are kept in the final model (column III), in order to control for patient needs and socioeconomic characteristics. This full model explains 75% of the inter-facility variance of patient informal payments. The risk of incurring an informal payment appears to be significantly higher in hospitals where long waiting times are observed ($AOR(95\%CI) = 3.70(1.26-10.84)$) and in facilities where a high proportion of physicians consider that they are not sufficiently remunerated for HIV-care they provide ($AOR(95\%CI) = 2.29(0.96-5.49)$). Also, informal payments are significantly less likely to occur in health facilities practicing task-shifting ($AOR(95\%CI) = 0.45(0.18-1.11)$).

The effect of the health facility ownership is found to be mitigated. For instance, while no significant difference is observed between public facilities and private for-profit hospitals (AOR(95%CI) = 2.46(0.74-8.17)), the probability of incurring informal payments is much more lower in private non-profit hospitals (AOR(95%CI) = 0.06(0.01-0.33)). Among the control variables, age, self-rated health, ART and marital status remain significant in this final model. Also, two of the individual factors (ART and gender) have significant random effects⁹ ($p < 0.001$). This also validates our modeling based on multilevel mixed-effects regression rather than ordinary multiple regression analysis which might have produced biased results due to heteroscedasticity¹⁰[33]. It is also of interest to note that no significant interactions are found between individual and healthcare supply factors. Lastly, a sensitivity analysis conducted by excluding all health facilities where no informal payment has been observed (column IV), confirms our findings, with a higher significance of task-shifting.

5. Discussion

Literature on health care informal payments is quite diverse [5,6]. Yet, little is known about the role of supply-side factors, particularly in the context of sub-Saharan African countries. While controlling for a set of demand-side characteristics, this article presents one of the rare analyses of the role of supply-side factors, using the particular case of HIV-care in Cameroon. Given the specific nature of data and the way our variable of interest is constructed, a multilevel mixed-effects model is used. This allows to better explain the variation in the dependent variable (the probability of incurring an informal payment) which is due, in part, to grouping structure of data.

We obtain an incidence of informal payments for one consultation (3.05%) which is higher – but comparable - than what was found in the overall population in 2007 (2.3%) by the National Institute of Statistics [36]. Not surprisingly, this incidence and the average amount paid informally are particularly high in health facilities where HIV-consultation was supposed to be free of charge. The result on the effect of task-shifting is policy-relevant, particularly in contexts where the number of doctors is low relative to the HIV-caseload. Indeed, while previous findings suggested that the task-shifting is an efficient way of using available human resources [37], and is significantly associated with a lower-risk of non-adherence to antiretroviral treatment [24], our results illustrate an additional potential

⁹ Meaning that the effects of these two factors on the probability of incurring an informal payment vary from a group (health facility) to another

¹⁰ The variance of the residual errors is not independent of the values of explanatory variables

advantage: using task-shifting may reduce the risk of illicit payments practices. This appears to be consistent with the theory of “INXIT” – previously introduced by Gaal and McKee [13]. Accordingly, informal payments tend to be more important where the channels of “EXIT” are blocked (i.e., in the absence of alternatives). Indeed, the implementation of task-shifting in a facility may prevent monopoly rent-seeking practices as patients are not compelled to have all their consultations only with physicians, hence, incurring lower risk of extra charges. However, one should be careful that transferring tasks from doctors to nurses does not involve a shift of informal payments from the former to the latter – an issue that needs to be addressed in future studies as task-shifting has recently been incorporated (early 2013) in the national policy of HIV-care in Cameroon¹¹. Nonetheless, our results on lower informal payments in private non-profit health facilities compared with the public ones remain in line with previous findings suggesting that the perception and magnitude of informal payments is highest in the public sector [1,2,30]. Our results also suggest that the incidence of informal payments is significantly related to health personnel’s perceptions. This is not surprising as informal payments may be used as a means to attain the higher expectations of those who consider having a high workload and who are unsatisfied of the returns on their efforts. Indeed, previous studies have already identify informal charging as a “coping strategy” used by workers who consider that their returns do not fit with their effort [15,16,28,35,38-40]. In Cameroon health workers are typically paid a fixed monthly wage plus (but not always) a “profit sharing” which depends on hospital’s financial receipts. As the health personnel survey revealed that 76.29% of physicians are not satisfied with their compensation, policy-makers should consider introducing new financial incentives through wage increases or performance-based schemes, in order to reduce informal payments.

Turning to individual characteristics, our results clearly indicate that informal payments are associated with patients self-perceived health status, suggesting that patients in poor health status make these payments to get more attention and care from health workers [29,41]. By contrast, the result on lower incidence of informal payments amongst those following ARTs can be explained by the good relationships with the staff built over time through the regular consultations. This is consistent with the idea that patients pay less when consultations become routine, thus, require less effort from doctors.

¹¹ At the time of survey, task-shifting in HIV-care was practiced by some facilities though not officially adopted as a national policy [24].

Although the results presented in this study are based on data taken from a nationally representative survey of PLWHA, some limitations must be acknowledged. First, due to the lack of data on payments made for medications and medical examinations, the analysis focused on payments for consultations. This might have underestimated the incidence and intensity of informal payments incurred by PLWHA. Second, the statistical analysis revealed that informal payments can substantially increase the financial burden on PLWHA as the amount paid informally was found to be 4 times higher than the official tariff in certain cases. However, the number of patients in our sample who incurred an informal payment (n = 50) did not permit an elaborate econometric analysis on the amount paid informally. Lastly, informal payments can also be made in-kind or in the form of services. The absence of any information on these forms might also have underestimated the magnitude of informal payments. Future analysis shall take into account these different aspects to fully assess the burden of informal payments in Cameroon [6,35,42-44].

6. Conclusion

Results presented in this study while highlighting the incidence of a rather illicit practice as well as the factors associated with its occurrence, call for some policy measures primarily related to the management of health care supply. In particular, a more effective incentive system, taking into consideration the nature of activity and the performance of the personnel to increase their compensation, is in order. In addition, a better organization of health staff, reinforcing task-shifting and responsibilities within health care facilities can help reduce their work overload, thus, lower the incentive to extort informal payments.

7. References

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Table 1: Description of the Sample (n=1637), incidence and amount of informal payments

Variable	Sample		Informal payments				
			Incidence		Amount (FCFA*)		
	n	%	n	%	Mean	SD	
Gender	Male	529	32.32	14	2.65	2 636	2 638
	Female	1108	67.68	36	3.25	2 138	2 146
Age	20-29 years	344	21.01	14	4.07	2 368	2 081
	30-39 years	716	43.74	20	2.79	1 915	2 290
	40-49 years	393	24.01	12	3.05	2 867	2 515
	> 50 years	184	11.24	4	2.17	2 000	2 672
Residence	Urban	1289	78.74	40	3.10	2 413	2 290
	Rural	348	21.26	10	2.87	1 735	2 261
Education	<= Primary	708	43.25	24	3.39	2 252	2 337
	>= Secondary	929	56.75	26	2.80	2 300	2 267
Employment	Worker	1108	67.68	34	3.07	2 399	2 364
	Unemployed	529	32.32	16	3.02	2 019	2 132
Married	Yes	634	38.73	24	3.79	1410	1 560
	No	1003	61.27	26	2.59	3077	2 558
	I (The poorest)	301	18.39	8	2.66	1594	2 082
Household income quintile	II	332	20.28	9	2.71	2667	2 298
	III	341	20.83	8	2.35	1 975	2 497
	IV	334	20.40	14	4.19	2 693	2 571
	V (The richest)	329	20.10	11	3.34	2 145	2 088
Self-rated health	Good	1209	73.85	19	1.57	1 979	2 048
	Poor	428	26.15	31	7.24	2 460	2 422
Antiretroviral treatment	Yes	1213	74.10	19	1.57	1474	1587
	No	424	25.90	31	7.31	2 769	2 510
Facility ownership	Public	1138	69.52	34	2.99	1 135	1 023
	Private for-profit	110	6.72	13	11.82	5 577	1 525
	Private non for-profit	389	23.76	3	0.77	917	382
Task shifting	Yes	1239	75.69	30	2.42	918	750
	No	398	24.31	20	5.03	4 315	2 287
% doctors considering HIV-care as difficult and not sufficiently paid	<=15%	746	45.57	23	3.08	3 800	2 508
	>15%	891	54.43	27	3.03	980	808
% patients with waiting time > 1 hour	<=15%	660	40.32	20	3.03	3 968	2 585
	>15%	977	59.68	30	3.07	1 150	1 049

* 1 US\$ = 492.6 FCFA (exchange rate at time of survey)

Table 2 : Distribution of health care facilities and patients according to the official tariff charged for a consultation

Official tariff charged for a consultation by a doctor (FCFA)	Health facilities		Patients		Informal payments	
	n	n	%	Incidence		Average amount ¹² (SD)
				n	%	
0	3	112	6.84	18	16.07	4461 (2328)
300	1	49	2.99	0	0	-
500	1	105	6.41	3	2.86	917 (382)
600	12	415	25.35	15	3.61	667 (572)
700	1	24	1.47	0	0	-
1000	2	227	13.87	6	2.64	1083 (492)
1500	2	79	4.83	1	1.27	500 (-)
1600	1	221	13.5	5	2.26	1560 (1609)
2000	2	172	10.51	0	0	-
3000	2	233	14.23	2	0.86	3000 (0)
Total	27	1637	100	50	3.05	2277 (2278)

Table 3a: Amount paid informally & total cost of consultation (FCFA)

	Actual payment (P _{ij})	Informal payment (A _{ij})
Min.	600	200
Max.	6000	6000
Average (s.d.)	2917 (2135)	2277 (2278)
Total	145850	113850

Table 3b: Distribution of patients according to the ratios A_{ij}/P_{ij} & A_{ij}/T_j

Ratio A _{ij} /P _{ij}	n	%	Ratio A _{ij} /T _j	n	%
[0.2, 0.4[	9	18	]0, 1[	15	30
[0.4, 0.6[	15	30	[1, 2[	11	22
[0.6, 0.8[	7	14	[2, 4]	6	12
[0.8, 1.0]	19	38	∞*	18	36
Total	50	100	Total	50	100

* patients who consulted in health facilities where T_j=0

¹² Only the 50 patients who made an informal payment are considered

Table 4: Factors associated with incidence of informal payments using mixed-effects logistic modeling

Variables	I		II		III		IV	
	Coef.(SE)	AOR	95% IC	AOR	95% IC	AOR	95% IC	
Intercept	-3.77(0.75)***							
Individual / demand-side fixed-effects	Gender	Female	1		1		1	
		Male	0.66	0.31-1.41	0.67	0.32-1.42	0.66	0.31-1.39
	Age (years)		0.96	0.93-1.00*	0.97	0.93-1.00*	0.99	0.95-1.02
	Residence	Rural	1		1		1	
		Urban	0.94	0.38-2.33	0.80	0.34-1.88	0.96	0.40-2.32
	Education	<= Primary	1		1		1	
		>= Secondary	0.70	0.35-1.41	0.63	0.32-1.25	0.73	0.36-1.46
	Employment	Unemployed	1		1		1	
		Worker	1.09	0.53-2.22	1.17	0.58-2.39	1.22	0.59-2.52
	Married	No	1		1		1	
		Yes	2.08	1.06-4.09**	2.21	1.14-4.28**	2.32	1.18-4.54**
	Household income quintile	I (The poorest)	1		1		1	
		II	0.73	0.25-2.09	0.77	0.27-2.20	1.05	.36-3.11
		III	1.06	0.34-3.26	1.19	0.38-3.70	1.32	0.42-4.15
		IV	1.34	0.49-3.68	1.39	0.51-3.81	1.66	0.59-4.69
V (The richest)		1.64	0.52-5.16	1.60	0.51-4.99	1.79	0.56-5.74	
Self-rated health	Poor	1		1		1		
	Good	0.25	0.12-0.50***	0.27	0.14-0.55***	0.30	0.15-0.61***	
Antiretroviral treatment (ART)	No	1		1		1		
	Yes	0.28	0.14-0.57***	0.31	0.16-0.61***	0.31	0.16-0.63	
Group / supply-side fixed-effects	Facility ownership	Public			1		1	
		Private for-profit			2.46	0.74-8.18	0.79	0.22-2.84
	Private non-profit			0.06	0.01-0.33***	0.04	0.00-0.29***	
	Task shifting	No			1		1	
		Yes			0.45	0.18-1.11*	0.10	0.02-0.43**
	% doctors considering HIV-care as difficult and not sufficiently paid	<=25%			1		1	
		>25%			2.29	0.96-5.49*	5.56	0.84-36.76*
% patients with waiting time > 1 hour	<=25%			1		1		
	>25%			3.70	1.26-10.84**	2.07	1.07-3.98**	
Random-effects	Variance of the individual-level residuals (σ^2_{ϵ})		3.29		3.29		3.29	
	Variance of ART					0.17		0.59
	Variance of gender					2.3		0.27
	Variance of the group-level residuals (σ^2_{u0})		4.58		2.26		1.16		0.57
Intraclass correlation		0.58						
% inter-group variance explained						0.75	0.88	
Log likelihood		-201.61		-177.76		-157.25		-147.54
Number of observations		1637		1637		1637		1152

*** significant at 1%; ** significant at 5%; * significant at 10%

AOR: Adjusted Odds Ratio SE: Standard Error