Institutions and Leakage of Public Funds in the Cameroonian Healthcare Delivery Chain

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ABSTRACT

This study attempts to examine the extent of leakage in the Cameroonian health sector and identify its sources. The analyses in the study are based on the Public Expenditure Tracking Survey data collected in Cameroon in 2004. The findings reveal that 18.8% of the actual budget allocations of decentralized health services in the Ministry of Public Health do not reach them. Health centers, which are the frontline healthcare providers, receive only 26.4% of their actual budgets contained in the recurrent expenditures of the decentralized health services. We investigate the institutional factors that correlate with the leakage rates and identified the factors that affect the likelihood of health centers receiving public funds. The study finds weak compact and voice institutional links in the Cameroonian health accountability system. The need to effectively control and monitor public funds, improve the information flow mechanism and improve the wage/allowance scale is highlighted. Finally, spending rules should be strictly respected and extra-budgetary spending restricted.

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INTRODUCTION

The provision of quality health meets one of the basic human needs and contributes significantly towards maintaining and enhancing people’s productive potential. Improving health reduces production losses caused by worker illnesses and increases the enrolment of children in school and makes them better able to learn. All these form investment in human capital and have positive impacts on adult productivity, earnings, quality of life and socioeconomic development (World Bank 1993).

In recognizing these benefits, the Cameroon government has been designing and implementing health policies aimed at improving the country’s human capital. As articulated in the various documents (see Republic of Cameroon, 2000), the policies have invariably attempted to promote coverage of and access to healthcare services for the population by attributing a significant proportion of the budget to the health sector. Despite the impressive economic growth and significant resources allocated to the health sector since 1996, Cameroon’s health service outcomes have remained mediocre.

For instance, major health indicators including infant, child and maternal mortality as well as life expectancy at birth are hardly above the Sub-Sahara African average (WHO, 2000). To better address these issues, the Cameroon government adopted the Poverty Reduction Strategy Paper with the support of the donor community in 2003. In this reference document, high priority is given to the education and health sectors. The government and the general public are concerned that, patients receive the appropriate level of care and that the care be delivered as efficiently as possible. Again, there is a growing feeling that public sector agencies, financed with public funds, should be held accountable for the services they provide. But do the public resources reach the service providers in the first place? Are health facilities simply being wasteful? Indeed, as noted in World Bank (2004), public health resources as recorded in budgetary allocations may not be adequate measures of resource availability especially in a weak

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2 Economic growth has averaged 4.5% per year since 1996 (INS, 2004). We note here that the health sector has been receiving the 2nd highest budgetary allocation per ministry each year after the Ministry of Basic Education (see Ministère de l’Economie et des Finances, 1997).
The main objective of our study is to estimate the extent of leakage in the Cameroonian health sector and empirically identify its sources. The specific objectives are to:

- estimate the extent of leakage in the Cameroonian health sector
- identify institutional factors that associate with leakage of public health funds (i.e. institutional correlates of leakage)
- investigate the determinants of public funds received by health facilities
- explore policy implications from the analysis

In spite of a consensus on the importance of public financing in improving health outcomes, it remains inadequately monitored and evaluated in the Cameroonian context. Since increased budgetary resources do not guarantee improved health outcomes, it is of policy interest to identify existing bottlenecks before injecting more funds into the sector. Anecdotal evidence has generally been to attribute failure to deliver to corruption or mismanagement of public funds. But the answer does not lie only in spending misallocations: the policy and institutional framework for expenditure management and service delivery is often of equal or greater importance.

The remaining part of the study is organized as follows. Section 2 briefly presents the structure of the Cameroonian health sector. Section 3 presents an overview of the budgeting process in Cameroon. Section 4 establishes a theoretical framework between institutions and healthcare delivery. Section 5 describes the data and the methodologies employed in our study. The empirical

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3 It should be noted that between 1998 and 2001 the German NGO Transparency International gave first position to Cameroon in 1998 and 1999 in its ranking of the world’s most corrupt countries. In 2000, Cameroon occupied 7th position and was promoted to 5th position in 2001. This dubious honor served as a wake-up call to the Cameroonian community and turned the attention of the international community to the Cameroonian authorities’ management of public affairs.
findings are presented and discussed in Section 6; while Section 7 concludes the paper.

STRUCTURE OF THE CAMEROONIAN HEALTH SYSTEM

In 1985, Cameroon subscribed to the Primary Health Care (PHC) approach to healthcare delivery aimed at making quality healthcare more accessible to the population. In order to achieve this, the country’s health system is organized in three pyramidal structures according to the African scenario for implementation of PHC in three phases. The Ministry of Public Health (MoPH) represented by the central level, is responsible for formulating national health policies. At the intermediate level, one finds the 10 Regional Health Delegations—each headed by a regional delegate who is in charge of coordinating and implementing the strategy at the regional level. They represent the ministry and ensure technical support to districts through supervision, training and coordination of all subsectors of health within the region. From the operational point of view and in order to improve accessibility to health facilities for the population, the country is carved out into 154 health districts comprising the peripheral level (Ngufor, 1999).

The health sector is divided into the public and private sectors. The public sector comprises government health facilities constituting about 60% of all health facilities. The private health sector can be subdivided into the profit-making and the non-profit-making subsectors. About 38% of the whole health sector is non-lucrative belonging to religious organizations in most part and the private lucrative accounts for about 2% of health facilities (Ministère de la Santé Publique. 1999).

AN OVERVIEW OF THE BUDGETING PROCESS IN CAMEROON

Before we attempt to measure the extent of leakage, it may be helpful to understand the structure of the budgeting process, the actors and the rules for allocation of public resources to health service providers in Cameroon.
BUDGET PREPARATION AND EXECUTION

The Cameroon budget law and the budget cycle are inspired by the old French budget regime. The budgetary cycle starts with the preparation of estimates of fiscal revenue forecasts by the Directorate of Forecasting in cooperation with the Directorate of Taxes and Customs (see Ministère de l’Economie et des Finances, 1998; MINFI, 2003). Based on these estimates, the Budget Directorate determines the resource envelopes for each line ministry. This is a strictly internal exercise without communication with the line ministries. The resulting allocations are published in the “Budget Circular”, which is signed by the President of the Republic, and distributed among line ministries. Based on the orientations supplied by the “Budget Circular”, the line ministries elaborate their draft budgets which are subsequently reviewed by Ministry of Finance (MINFI) on the recurrent budget and Ministry of Planning & Regional Development (MINEPAT) concerning the investment budget. These set the final envelopes for each line ministry, including the distribution of the budget within the envelope. After setting the final envelopes, each line ministry is invited to the Budget Directorate, to discuss the ceilings. This stage is not more than a formality: in reality the ceilings have already been set. Finally, MINFI adopts the budget and presents it to Parliament during the budget conference where it is voted on. In Parliament, each line ministry gets to defend its budget. Observe that allocations of the budget are made, and communicated (top-down) towards the various decentralized units. Once the budget is voted upon, the spending circuit starts.

EMPIRICAL REVIEW OF THE ANALYSIS OF LEAKAGES

Whether public resources for staff and other inputs reach the front line providers - the health centers that deliver the services to the population – is critical to a functioning health system. The World Bank has pioneered efforts to measure the extent of leakage, that is, the amount of the line ministry’s budget that reaches the intended schools and health facilities funded through national transfers.

Uganda was the first country to implement PETS in 1996 (Ablo and Reinikka 1998). The motivation for such an effort was the fact that though the

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4 See the French Ordinance of 1959 on Budget Law and the 1962 Decree on Public Accounting.
5 The budget of Cameroon is divided into an investment and a recurrent part, where MINFI is responsible for the recurrent budget and MINEPAT for the investment budget.
official reports indicated that there was a substantial increase in public spending on education; primary school enrollment did not show any improvement. The PETS focused on primary education and health care in its effort to compare budget allocation to actual spending through the different levels of government, including frontline service delivery units in both primary schools and clinics. Due to lack of adequate and sufficient public accounts to reflect actual spending, surveys were conducted in 19 districts (out of 39), 250 government primary school and 100 health clinics. The school survey indicated that on average, only 13% of the funds provided by the central government reached the schools. 87% was misused either for personal gain or for purposes not intended for education. Roughly 70% of the schools did not receive anything.

Subsequent to the Uganda study, PETS have now been undertaken in a large number of countries and have become a standard tool for public expenditure analysis. For example, two PETS were implemented in Tanzania in 1999 and 2001 (see Price Waterhouse Coopers, 1999). In the first Tanzanian PETS 45 primary schools and 36 health facilities in three districts was considered. The survey indicated diversion of a large portion of funds (about 57 percent in education and 41 percent in health care) disbursed by the center for non-wage education and health expenditures to other non-education sectors and also for personal gain. The second PETS had a similar focus as the first one (on health and education). However, additional information was collected that included pro-poor expenditures for rural water supply, rural roads, judiciary and HIV/AIDS. The survey was implemented in four primary schools and four clinics in each of the five selected districts. It was found that there were substantial delays in disbursement of funds at all levels of the government.

Another PETS study has been conducted in Ghana. The rationale for employing PETS in Ghana in 2000 (see Ye and Canagarajah, 2002) was similar to that of Uganda and Tanzania in intent (evaluate actual spending and appraise leakage of funds in the transfer from government through districts to service facilities) as well as sectors (basic education and primary health care). The Ghana PETS covered four districts in each of the ten regions. It included interviews of 40 district education officers and 40 district health officers, and a facility–level survey of a total of 119 primary schools, 79 junior secondary schools and 173 primary health clinics. The results of this initiative indicated that 20% of non-wage public
health expenditure and 50% of nonwage education expenditure reached the frontline facilities.

A recent PETS study in Chad estimates the extent of leakage of public resources in the health sector (Gauthier and Wane, 2008). The survey covered 281 health centers and results indicate that these health centers which are the frontline providers, receive less than 1% of the ministry’s non-wage recurrent expenditures. It is further estimated that had public resources earmarked for the frontline providers reached them in their entirety, the number of patients seeking primary health care in Chad would have more than doubled.

To gain a better understanding of the process and impediments to effective budget execution, the Cameroon government ordered a public expenditure tracking survey (PETS) in 2004 in the health sector. The survey identified numerous bottlenecks in the implementation of the budget. The survey reported that 61% of health centers experienced abnormally long delays in the notification of expenditure authorization. Surprisingly, these delays were not fully reflected in the execution rates of the expenditure budgets during that period. For example, the average execution rate was estimated at 70%. These execution rates, however, hide underlying problems in the quality of the expenditure. Because they receive their resources after long delays; budget holders are inclined to precipitate spending before the end of the fiscal year, thus adversely affecting the quality of spending. As a result, they often find themselves hostage of the local suppliers who have mastered the budget game and are more apt in the art of overpricing materials and side-contracting.

The survey also revealed poor record keeping at the peripheral level which leads to a complete lack of accountability. Facilities do not keep track of their expenses and are not sanctioned to do so in the absence of ex-post controls. As a result, the MoPH may know the theoretical execution of the budget, but cannot gauge whether the budget has been executed as planned. This becomes a major difficulty during the PETS since the lack of information makes it difficult to assess the extent to which facilities, in executing their budgets, diverge from MoPH plans. For example, a situation may arise if the head of a health center spends the maintenance credit line on furniture or medical consumables; or just cashes the money by signing a side contract with a local supplier.

The Cameroon tracking survey report did mention the problems of leakage in the narrow sense of intended beneficiaries receiving less than the stated amount in the Finance Law. However, no definite conclusion was reached on the
leakage rates. Our task consists, therefore, of diagnosing leakage in greater detail, and going beyond the diagnosis, to identify the key institutional aspects that correlate with leakage. By tracking government spending our study sets out to shade more light on how much actual spending trickles down from the central level to targeted beneficiaries.

**INSTITUTIONS AND HEALTHCARE DELIVERY FRAMEWORK**

One of the main models used to analyze public service delivery is the principal-agent model. The model emphasizes the relationships between citizens, politicians and service providers. A critical issue in most service delivery is delegation. Delegation occurs when the principal decides that an activity is to be accomplished but cannot easily perform the task themselves. The principal is left with the option of hiring an agent to act on their behalf. Citizens acting as the principals delegate responsibilities to elected officials (state) to provide public services and pay taxes to fund them. Politicians in turn delegate service delivery to providers by creating incentives and appropriating budgets (World Bank, 2004). Unfortunately, just as principals cannot do the task themselves, they often have difficulty knowing if they have hired the right person for the task and whether the task is being accomplished appropriately. The two problems—hiring the right agent and knowing that they will do the job appropriately—are known respectively as adverse selection and moral hazard (Ricketts 2002 and Collier, 2007).

Moral hazard behavior emerges because the principal and agent often have conflicting goals. This conflict is exacerbated by the fact that monitoring the actions of an agent can be costly. Adverse selection problems leave principals in the position of not knowing if they have hired the right person for the job and if the agent is actually doing the task required. Often the principal is not able to fully observe what the agent does. Since the agent obviously knows what he/she does, the agent has information advantage and different interests to that of the principal and acts in ways that promotes the agent’s interests over the principal’s. So, the agency problem arises because there is always the possibility that the agent will not act in the best interests of the principals but may serve their own interests first.

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6 The principal may be a parent who wants his sick child to be well-treated, and the agent the doctor/nurse whose effort determines the quality of healthcare.
This network of principal-agent relationships is at the root of government failure in the provision of public services.

The appropriate healthcare delivery framework in this study hinges on the accountability relationships between the principal and agents. World Bank (2004) maintains that there are two main layers of accountability relationships in the principal-agent relationship of service delivery. First, citizens have to hold government/policy-makers accountable for allocating resources for service delivery and for providing appropriate incentives for performance. This is called in the literature voice. It refers to the extent to which citizens are able to participate in the selection of governments, and have freedom of expression and association. The aim of voice is to empower citizens through a more participatory approach by providing them with mechanisms to make informed decisions that affect their lives. Second, government has to hold service providers accountable for delivering the proper services—referred to as compact. This sequential process of accountability where the client/citizen does not influence service provision directly but through the policy makers has been referred to as the “long route” of accountability. This is opposed to the “short route,” which involves direct accountability of providers to clients—called client power (Gauthier and Reinikka, 2007). Inadequate service delivery could hence be associated with failures in one or both of the links along the “long route” of accountability.

We may extend this accountability chain to the Cameroon context as follows. Citizens, as principal, enter into contract with the government to deliver health services. This is the first principal-agent relationship. Yet, the MoPH through the central administration has delegated much of public health policy to the decentralized health services (regional delegations and district health services). Thus the central administration-decentralized health services can be viewed as a second principal-agent relationship. Within the decentralized health services, finances and authority are delegated to health centers to provide healthcare services to the population.

The health centers perform these tasks and responsibilities, and inform the MoPH (through the decentralized health services) of the effort made. The MoPH (the principal) then enforces performance through supervisions and controls. This is the final principal-agent relationship which is at the center of health-based decision making. However, citizens also have the power to hold health facilities accountable (client power) by reporting poor performance and launching complaints.
In the Cameroonian context civil society organizations hardly empower individuals to effectively express their views to government. Moreover, because of the non-capture of the institutional aspects of client power in the PETS data set, we restrict our analyses to the institutional aspects of compact and voice to investigate how they associate with leakage/share rates and public funds received. Government failure in the delivering of health service would result if there are institutional weaknesses in either or both links connecting the actors in the principal-agent accountability framework.

DATA AND METHODS OF ANALYSIS

DATA

The data for this study are contained in the Cameroon health PETS conducted in 2004 by the National Institute of Statistics with the support of the World Bank. The Cameroon health PETS was conducted jointly with the Quantitative Service Delivery Survey (QSDS) and lasted from October 2003 to March 2004. The Cameroonian PETS adopted a sample survey methodology. The sample had a broad national coverage. The country was disaggregated into 12 strata comprised of the 10 regions and the two metropolitan towns of Yaoundé and Douala. The units of analysis were the decentralized health services (10 regional health delegations and 36 district health services) and 144 health facilities (109 public and 35 private). This gives a total sample size of 190 units of analysis that were surveyed.

We also collected some administrative data, notably "MINFI, 2003-Lois des Finances" i.e. the 2003 Finance Law. Information from this document was helpful to triangulate the budget and spending flows along the health structure.

METHODS OF ANALYSIS

(a) Measurement of leakage

We employ descriptive statistics to estimate the extent of leakage. Generally, leakage is understood as the proportion of public resources budgeted but not received by the identified beneficiaries (see Reinikka and Smith, 2004; Lindelow, 2008). However, since budgetary allocations may not always coincide with actual spending, we consider leakage in this study from the expenditure side. In other words, we compare expenditure with the actual budget of the unit. It would be unfair to consider as leakage a discrepancy between spending and the
planned budget, because the budget is essentially a projection and may not be attained. We may therefore express the leakage rate as:

\[
\text{leakage rate}_i = 1 - \frac{\text{resources received by beneficiary } i}{\text{actual budgeted resources for beneficiary } i}
\]  

(1)

We use equation (1) to determine leakage at both the decentralized health service levels and health facility levels. However, for the individual health facilities, their budgeted resources are often included in the budget of the decentralized health service in which the facility is located. Therefore, we will be estimating two leakage rates, one between the MoPH and the decentralized health services and the other between decentralized health services and individual health facilities.

We note that spending rules in the Cameroonian budgetary process are easily circumvented. Extra-budgetary spending is common, and political interference in the decision to spend is strong. Sector and other ceilings are not perceived to be hard. As long as the criteria posed in the budget are respected, sector allocations within the region are merely indicative and might easily be changed during budget execution, based on decisions of the budget holders. The absence of hard budgetary allocation rules complicates the measurement of leakage in the classical sense. Our task therefore consists of attempting to compute “leakage rates” in a soft allocation rules context and our results should therefore be interpreted with care.

(b) Institutional correlates of leakage

To address specific objective 2 which consists of investigate the institutional factors that correlate with the leakage of public funds we employed a censored regression analysis- specifically a Tobit model. Our use of the Tobit regression model is justified on the grounds that some health facilities did receive all the resources budgeted for them (in which the leakage rate is 0) while others did not receive any funds. Thus, the leakage rate (the dependent variable) ranges between 0 and 1. The Tobit model is a censored normal regression model, applicable in cases where the dependent variable is constrained in some way. In our case the dependent variable (the leakage rate) is observed for values greater than 0 but is not observed (that is censored) for values of zero or less. The structural equation in the Tobit model is expressed as follows (see Greene, 2003; Kimenyi et al., 2006):
where $y^*_i$ is the latent dependent variable that is observed for values greater than 0 and censored otherwise, that is the data are censored at 0; $y_i$ is the observed dependent variable; $\beta_i$ is a vector of parameters to be estimated; $x_i$ is a vector of independent variables, and $\mu_i$ is the stochastic term and assumed to be independently normally distributed. The Tobit model is non-linear and its estimation is done using the maximum likelihood method.

The explanatory variables of the regression include the institutional aspects that impact compact and associate with leakages. We assume that a strong compact between the MoPH (principal) and the health facilities (the agents) associates with lower leakage rates. As we mentioned earlier, the agency problem arises from the fact that the principal faces difficulties in observing the agent’s activity. Thus an attempt at improving monitoring would enforce compact and thus lower leakages. Two variables capture monitoring in this study. These are supervision (number of times health service administration/health centers are inspected per year) and health committee meetings (number of times health management committee meets per year). Thus monitoring in this study takes two main forms: agents are monitored from above (top-down monitoring, e.g. visits by a health inspector), or from below (bottom-up monitoring) – by the community they serve. Monitoring by central/regional health administrators are intended to make sure that resources allocated for health care delivery reach the health care facility and are used properly.

The publication and dissemination of key health sector documents and reports, including annual budgets and performance reviews, promotes accountability and transparency in the health sector. This information helps to create an informed public, and serves to improve government accountability to the public at large. We identify two core variables relating to the publication and dissemination of information. These are budget knowledge (a dummy of 1 if the health service administration/health center is aware of its budget allocation; that is, it knows how much to expect) and production of annual audit reports (dummy of 1 if audit reports are produced and disseminated). Therefore we expect a good
information system to enforce compact between policy-makers and the health facilities and reduce leakage.

Another variable likely to influence leakage is the *mode of medical supplies* (dummy of 1 if open competitive bidding of suppliers of medical equipment is applied). This variable captures the effectiveness or governance of the Cameroonian health system because it measures whether health rules and procedures are being effectively implemented or enforced. A significant negative influence of this variable can be considered as an indication of good governance resulting in lower leakages.

Two variables capture provider incentives in this study. These are *wages* (share of non-permanent staff in budget) and *allowances* (share of personnel allowances in budget). The importance of incentives is underlined by the fact that insufficient reward is an important source of frustration among health workers (Serneels and Lievens, 2008). When wages and allowances are modest, health personnel may lack the incentives to comply with record keeping and inspection activities. The resulting poor record keeping of financial documents and inadequate field inspections (in terms of quantity and quality) are of a nature to favor leakages.

(c) Determinants of public funds received

To address specific objective 3, which consists of investigating the factors that affect the likelihood of health centers receiving public funds, we follow Gauthier and Wane (2008) to consider whether the health facility received public funds or not. This implies that the dependent variable is dichotomous and we estimated a probit model. The probit model is simply a regression where the latent dependent variable \( y_i^* \) is observed only in terms of its sign (see Greene, 2003). That is, the probit equation may be expressed as:

\[
y_i^* = \beta X_i + \varepsilon_i
\]

where \( y_i = 0 \) if \( y_i^* \leq 0 \) and \( y_i = 1 \) if \( y_i^* > 0 \)

The empirically estimated probit equation is expressed as:

\[
Pr(y_j = 1) = F(\alpha_1 + \alpha_2 X_i + \varepsilon_i)
\]

where \( y_j \) indicates that health facility \( i \) has received a strictly positive amount of public funds \( j \). \( X_i \) is a vector of institutional aspects that impact *voice*, health facility characteristics or other control variables. \( F(.) \) is the standard normal distribution function and \( \varepsilon_i \) is the error term.
We assume here that a stronger citizen \textit{voice} correlates with the likelihood of health centers receiving public funds. We justify this by arguing that decentralized health administration receives funds from the MoPH to pass on to health facilities. However, the regional health delegations do have some discretion over the use of the funds and subsequent allocation to health facilities. In other words, a health center receives public funds only if the health administrative authorities arbitrarily decide to do so. In this case, it is logical to reason that lobbying, social cohesion in the health center or community, ethnic composition and whether the health center is located in an area that support the government in power can be major factors that determine the likelihood of public health centers receiving public funds. Under these conditions citizens can exercise their voice to launch a complaint or petition to higher authority. From the PETS data set there we selected health facility variables that impact voice. These are health center \textit{quality} (share of trained medical personnel in the health center staff) and \textit{size} of the health center proxy by total number of employees in the health center. These variables highlight the competence and force of the health facility to articulate their case to regional/district health officials. Another variable is \textit{inspection} of the health center by a regional/district health delegate. Inspection or supervision of the health center by a regional/district health delegate may create familiarity which facilitates lobbying by the community. These health facility variables are regressed alongside some control variables (such as potential population to be served by health facility, age of health facility, location, etc) to explain the level of public funds received by the health centers.

**EMPIRICAL RESULTS**

Here we present the extent of \textit{leakage} of public funds in the Cameroonian health sector and the econometric findings of the study.
EXTENT OF LEAKAGE

The traceability of budgetary and expenditure flows necessitate valid and complete information as concerns both the survey data and the Finance Law to facilitate data triangulation. The first crucial step was therefore to ensure that all the units of analysis have complete information. We observed that out of the 46 external health services effectively surveyed 38 had complete information. As for the 109 public health centers that were surveyed, we observed that as many as 12 (representing about 11%) had not been identified in the State Finance Law, thus only 97 had complete budget information.

We employed equation (1) to obtain information on the leakage variable for external health services and health centers. We estimated the average leakage rate at about 18.8% for the decentralized health services. This means that 18.8% of the public health expenditure earmarked for decentralized health services were either mismanaged or were used for purposes unrelated to health. We estimated the average leakage rate for health facilities at about 26.4%. These figures suggest that; firstly, leakage is more pronounced at the external service levels, and secondly that a reasonable proportion of public health expenditures are consumed by the central and regional/district administrations that do not provide direct services to the population.

ECONOMETRIC RESULTS

Before we proceed with the econometric analysis, it is useful we take a look at descriptive statistics of some explanatory variables that enter the regression equations (see Table 2A in the Appendix). We observe on Table 1A that the proportion of the budget paid as wages and allowances to non-permanent staff and personnel of the health facilities hardly reaches 10%. Observe also that the decentralized health services and health facilities are supervised at least once a year. The average age of the health centers is 17 years. A low average doctor to staff ratio of 3.2% is observed in the health centers.

(a) Correlates of leakage

The principal focus of our study is to investigate the institutional factors that correlate with the leakage rates observed at the external health administration

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7 See Table 1A for a detailed description of these variables.
and health center levels respectively. Our estimation results are reported in Table 1.

The outstanding results from Table 1 are that lax monitoring and information problems favor leakage. The evidence is provided by the negative significant association between supervision, meetings, budinfo and leakage rates respectively. The survey data revealed that most of the health facilities that were listed in the government budget did not receive clear information from central administration with regards to their authorized expenditure envelopes. This obviously reduces the efficiency of the budget allocation process and breeds mismanagement. The Modsupsplies variable also negatively correlates with leakage, though only moderately significant. This implies that there would be improvements in transparency and consequently reductions in leakage if medical supplies are obtained through open competitive bidding.

The Audits variable appears with the right sign but is insignificant. We explain this as follows. To ensure and facilitate good auditing a standardized record-keeping requirement is needed. In this regard health service administrators and health facilities are required to record cash receipts and keep reliable supporting documents. In practice, however, there is general failure to comply with this requirement, and the production of false receipts and documents is easy. Problems with poor record keeping are compounded by poor archiving of documents, making auditing messy. Moreover, the national audit authority does not exercise regular external oversight over budgetary executions, which means that overall audit coverage (in terms of quality and quantity) is limited. The lack of reliable supporting documents limits the ability to monitor fund flows.

Wages and allowances appear with the right signs and are significant. This may be explained by the fact that with extremely low wages and a lack of meritocratic promotion practices in the Cameroonian civil service, health workers do not have strong incentives to comply with good financial record keepings. Furthermore, small mission allowances do not allow health field supervisors to conduct regular and quality inspections. For example, it is common practice for the field inspectors to receive bribes and issue false inspection results. Together with the lack of incentives to conduct quality inspection, poor and messy financial records make the quality of monitoring activities questionable and may favor leakage.
Table 1: Tobit regression results relating leakage rates to covariates

<table>
<thead>
<tr>
<th>Variable</th>
<th>Decentralized health services</th>
<th>Health centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-2.251***</td>
<td>-2.674**</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(1.245)</td>
</tr>
<tr>
<td>Wages</td>
<td>-0.054**</td>
<td>-0.382**</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.063)</td>
</tr>
<tr>
<td>Allowances</td>
<td>-0.309**</td>
<td>-0.265*</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.083)</td>
</tr>
<tr>
<td>Supervision</td>
<td>-0.098***</td>
<td>-0.263**</td>
</tr>
<tr>
<td></td>
<td>(0.046)</td>
<td>(0.022)</td>
</tr>
<tr>
<td>Meetings</td>
<td>-0.029***</td>
<td>-0.382**</td>
</tr>
<tr>
<td></td>
<td>(0.056)</td>
<td>(0.043)</td>
</tr>
<tr>
<td>Budinfo</td>
<td>-0.050**</td>
<td>-0.265**</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.073)</td>
</tr>
<tr>
<td>Audits</td>
<td>-0.072</td>
<td>-0.128</td>
</tr>
<tr>
<td></td>
<td>(0.054)</td>
<td>(0.065)</td>
</tr>
<tr>
<td>Modsupplies</td>
<td>-0.051*</td>
<td>-0.061*</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.047)</td>
</tr>
<tr>
<td>Obs.</td>
<td>38</td>
<td>97</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.043</td>
<td>0.037</td>
</tr>
</tbody>
</table>

Source: Authors’ estimations based on 2004 Cameroonian health PETS
Note: Robust standard errors are in parentheses. ***Significant at 1%; ** Significant at 5%; * Significant at 10%.

Wages and allowances appear with the right signs and are significant. This may be explained by the fact that with extremely low wages and a lack of meritocratic promotion practices in the Cameroonian civil service, health workers do not have strong incentives to comply with good financial record keepings. Furthermore, small mission allowances do not allow health field supervisors to conduct regular and quality inspections. For example, it is common practice for the field inspectors to receive bribes and issue false inspection results. Together with the lack of incentives to conduct quality inspection, poor and messy financial records make the quality of monitoring activities questionable and may favor leakage.
(b) Determinants of public funds received by health centers

Table 2 displays the results of the regression results explaining the level of public funds received by health facilities.

We observe on Table 2 that older health centers are more likely to receive public funds. The size of the health facility and the potential population served, have an insignificant impact on the likelihood of receiving public funds. Urban health facilities are more likely to receive public funds than those located in the rural areas. The quality of the health center associates significantly with the likelihood of receiving public funds. This is because high quality enforces voice, thus enabling the health centers to better present their case to health service administrators.

An interesting result is the positive and significant impact of supervision on the receipt of public funds. This tells us that health administrators enjoyed some discretion in the allocation of funds, in the sense that the probability of receiving public funds is higher for health facilities that have been visited by the regional health delegates. On the other hand, the negative and significant impact of non-budgeted funds on the receipt of public funds tends to indicate that private domestic or foreign donor support has a crowding out effect on the public funds. Our results are consistent with similar findings by Gauthier and Wane (2008) in the case of Chad.
Table 2: Probit regression results of health centers receiving public funds

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-1.826 (2.855)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.076 (1.428)</td>
</tr>
<tr>
<td>Age square</td>
<td>0.134* (0.069)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.174 (0.537)</td>
</tr>
<tr>
<td>Quality of health center</td>
<td>0.357** (0.146)</td>
</tr>
<tr>
<td>Potential population</td>
<td>0.051 (0.091)</td>
</tr>
<tr>
<td>Supervision</td>
<td>0.301*** (0.066)</td>
</tr>
<tr>
<td>Received non-budgeted funds</td>
<td>-0.340** (0.154)</td>
</tr>
<tr>
<td>Location (Urban)</td>
<td>-1.412* (0.819)</td>
</tr>
</tbody>
</table>

Obs. 97  
Pseudo R² 0.079  
Log Likelihood -171.02

Source: Authors’ estimations based on 2004 Cameroonian health PETS
Note: Robust standard errors in parenthesis.

***Significant at 1%; ** Significant at 5%; * Significant at 10%.

CONCLUSION AND POLICY IMPLICATIONS

Based on the 2004 Cameroonian PETS, we have attempted to estimate the extent of leakage of recurrent public expenditure and investigated the sources in the health sector. Our findings reveal that 18.8% of the actual budget allocations of regional delegations in the MoPH do not reach them. As concerns health centres, which are the frontline healthcare providers, only 26.4% of their actual budgets contained in the recurrent expenditures of the decentralized health services do reach them. The official health budget allocations are therefore a poor proxy for services actually reaching the intended beneficiaries. We have also established that wages/allowances, supervision, information are the main correlates of leakage. The empirical results also tell us that the current budget allocations in the health sector seems to be linked to the discretion of regional/district health administrators in the sense that the probability of receiving public funds increases for health facilities that have been visited. Furthermore, extra-budgetary support seems to have a strong displacement effect on officially
budgeted funds, whereby health centers that have received foreign assistance are less likely to be supported by the higher administrative level. In a nutshell, we have identified a weak institutional link between the health service administrators and health centers in the Cameroonian health sector.

The extensive leakage of public funds in budget execution of the Cameroonian health system calls for urgent review of government policy. The existence of the principal-agent problem seems to be at the root of the appalling situation. Our hypothesis that a strong compact between the MoPH (principal) and the health facilities (the agents) associates with lower leakage rates is confirmed. Also, the assumption that a stronger citizen voice correlates with the likelihood of health centers receiving public funds is confirmed. In the face of these weak institutional links, we make the following major policy recommendations to ensure that the targeted recipients actually benefit from the recurrent expenditure of public funds.

We have established strong evidence of a negative significant association between supervision by health service administrators and the leakage rate respectively. Further still the frequency of health committee meetings correlates negatively with leakage. These are clear signs of weaknesses in the management and control system. This highlights the need to monitor public resources in the health system to ensure that they reach their intended beneficiaries. This can be achieved by improving on the verification system and supervision by health inspectors.

The present Cameroonian health system is operating in an environment of imperfect information. Thus improvements in information on issues such as awareness of official budget allocations may positively impact service delivery. The importance of information dissemination is clearly highlighted by Reinikka and Svensson (2004) in the Uganda case where a government information campaign advertised monthly education disbursements to districts. This campaign was coupled with a new government regulation requiring schools to display information publicly on the funds they had received, thereby allowing the public to compare disbursements with receipts and monitor expenditure flows. The information campaign played a critical role in improving spending outcomes.

As argued earlier, decentralized health services and health facilities paying low wages and allowances may suffer more from extensive leakages. We therefore recommend improvements in the wage/allowance scales which will
provide incentives for health workers to comply with good financial record keeping and quality inspections.

The respect of spending rules would make budget allocation and execution more transparent. Resources that are governed by hard allocation rules are easy to track, and any mismanagement of funds can easily be established. The absence of such rules favors leakage and breeds corruption.

REFERENCES


Appendix

Table 1A: Data description

<table>
<thead>
<tr>
<th>Variable name and description</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Wages</em>: share of non-permanent staff wages in budget</td>
<td><em>Wages</em></td>
</tr>
<tr>
<td><em>Allowances</em>: share of personnel allowances in budget</td>
<td><em>Allowances</em></td>
</tr>
<tr>
<td><em>Supervision</em>: number of times health service/health centre is supervised per year</td>
<td><em>Supervision</em></td>
</tr>
<tr>
<td><em>Frequency of committee meetings</em>: number of times health management committee meets per year</td>
<td><em>Meetings</em></td>
</tr>
<tr>
<td><em>Budget knowledge</em>: dummy (1 = awareness of budget allocation, 0 otherwise)</td>
<td><em>Budinfo</em></td>
</tr>
<tr>
<td><em>Audit reports</em>: dummy (1 = if annual audit reports are produced and disseminated, 0 otherwise)</td>
<td><em>Audit</em></td>
</tr>
<tr>
<td><em>Mode of medical supplies</em>: dummy (1 = open, competitive bidding of suppliers of medical equipment, 0 otherwise)</td>
<td><em>Modsupplies</em></td>
</tr>
<tr>
<td><em>Quality of health center</em>: proxy by share of doctors to total number of staff</td>
<td><em>Quality</em></td>
</tr>
<tr>
<td><em>Age of health centre</em>: proxy by the length of time or number of years in operation since its creation</td>
<td><em>Age</em></td>
</tr>
<tr>
<td><em>Size</em>: size of health facility proxy by number of employees (permanent and temporary staff).</td>
<td><em>Size</em></td>
</tr>
<tr>
<td><em>Location</em>: location of health facility (dummy of 1 = urban, 0 otherwise)</td>
<td><em>Location</em></td>
</tr>
<tr>
<td><em>Population</em>: potential population to be served by health facility</td>
<td><em>Pop</em></td>
</tr>
<tr>
<td><em>Non-budgeted funds</em>: dummy of 1 if health facility received other financial support from foreign donors (NGOs, elites, foreign governments, etc.); 0 otherwise.</td>
<td><em>Non-budget</em></td>
</tr>
</tbody>
</table>

Source: Summarized by authors from 2004 Cameroonian Health PETS
### Table 2A: Descriptive statistics of explanatory variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages (%)</td>
<td>135</td>
<td>7.6</td>
<td>12.3</td>
<td>0.0</td>
<td>52.3</td>
</tr>
<tr>
<td>Allowances (%)</td>
<td>135</td>
<td>9.8</td>
<td>23.2</td>
<td>0.0</td>
<td>48.4</td>
</tr>
<tr>
<td>Supervision (No. of times)</td>
<td>131</td>
<td>1.21</td>
<td>0.19</td>
<td>0.0</td>
<td>4</td>
</tr>
<tr>
<td>Committee meetings (No. of times)</td>
<td>97</td>
<td>1.01</td>
<td>3.2</td>
<td>0.0</td>
<td>4</td>
</tr>
<tr>
<td>Health center quality (doctor-staff ratio)</td>
<td>97</td>
<td>0.032</td>
<td>0.47</td>
<td>0.0</td>
<td>6</td>
</tr>
<tr>
<td>Budget knowledge</td>
<td>135</td>
<td>0.14</td>
<td>0.34</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mode of supplies</td>
<td>97</td>
<td>0.23</td>
<td>0.48</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Received non-budgeted funds</td>
<td>97</td>
<td>0.21</td>
<td>0.35</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Age of health center (years)</td>
<td>97</td>
<td>17.2</td>
<td>14.6</td>
<td>1</td>
<td>79</td>
</tr>
<tr>
<td>Number of employees</td>
<td>135</td>
<td>19.5</td>
<td>45.6</td>
<td>0.0</td>
<td>137</td>
</tr>
<tr>
<td>Location of health center</td>
<td>133</td>
<td>0.45</td>
<td>0.87</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Potential population</td>
<td>135</td>
<td>4759.6</td>
<td>2541.8</td>
<td>887.4</td>
<td>40663</td>
</tr>
</tbody>
</table>

Source: Authors’ computations based on 2004 Cameroonian health PETS