HEALTH SECTOR FOREIGN ASSISTANCE AND HOUSEHOLD TREATMENT-SEEKING BEHAVIOR IN FRAGILE STATES:
THE CASE OF RURAL SUD KIVU
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Key messages:
• Poor people, often concentrated in rural areas, have limited capacity to purchase formal health services. In post-conflict settings where government structures remain weak and the chain of health service delivery fragile, that challenge is even more acute.
• This study explores health-seeking behavior for formal and informal sector curative care in a rural, "post-conflict", extremely poor, and heavily donor-assisted context in the region of Sud-Kivu in the Democratic Republic of Congo (DRC). The study applies a discrete choice theoretical model and the mixed multinomial logit empirical model to measure determinants of health-seeking behavior.
• Household utilization of primary care is largely linked to emergency foreign assistance
• Age and socio-economic status are positively associated with use of formal-sector health care, especially secondary care
• Chronic diseases are associated with treatment-seeking in the informal sector, in particular traditional and religious healers

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Abstract
This study examines the role of health sector foreign assistance on household treatment-seeking behavior in a rural, post-conflict, extremely poor, and heavily donor-assisted context in the region of Sud-Kivu in the Democratic Republic of Congo (DRC). On the basis of the discrete choice theoretical model and the multinomial logit empirical model, data from a household survey jointly conducted by the Sud-Kivu’s regional Ministry of Health and the international NGO *Aide Medicale Internationale* was used to model treatment-seeking behavior and its relationship with emergency and health system strengthening interventions in the region.

Findings show that household utilization of primary care is largely linked to emergency foreign assistance. Age and socio-economic status are positively associated with use of formal-sector health care, especially secondary care. Chronic diseases are associated with treatment-seeking in the informal sector, in particular traditional and religious healers.

To address these concerns, government, foreign assistance organizations and communities should be involved in implementing and managing interventions that ensure that service delivery does not deteriorate after emergency relief ends. Strengthening health service delivery through Performance Based Financing and improving donor, government and other stakeholder coordination efforts through a Sector-wide Approach are two approaches that may facilitate obtaining such goals.
**Introduction**

It is widely acknowledged that health plays a major role in economic growth and socio-economic welfare. Good health maintains or improves human capital which in turn allows for improved labor returns and more economic growth (Audibert et al. 2008). In developing countries, access to quality primary health services may play a major role on health and productivity of the population, justifying therefore high public responsibility. Poor people, often concentrated in rural areas, have limited capacity to purchase such services, resulting in both poor population health and incomplete cost-recovery of primary health care provision. In addition, poor quality of health services and alternative care options such as traditional medicine and self-medication also contribute to weak demand for formal health care (O’Donnell 2007). In post-conflict or fragile state settings where government structures remain weak and the chain of health service delivery fragile; these challenges are even more acute. A fragile state is one which lacks some or all of the characteristics of a stable state; such as organizational capacity, legitimacy, political processes to manage expectations and access to resources (Gordon et al. 2010). Health seeking behaviors in fragile states differ from those in the context of stable states in several ways. In fragile states, the provision of public services is often insufficient or nonexistent due to the breakdown of public production and supply systems. Well-trained personnel would prefer working in urban or peaceful, stable areas; drug supply is limited due to challenges in access (due to conflict, armed force movement, breakdown in transportation systems, etc.). The demand for health services is also reduced, as the incidence of poverty and vulnerability are increased and households’ financial and geographic accessibility are reduced. The contexts of Sud Kivu and Nord Kivu regions in the Democratic Republic of Congo, Central African Republic and Sudan reflect these characteristics (Haar & Rubenstein 2012; Sondorp & Scheewe 2012).
In these delicate contexts, whenever possible, financial and technical assistance agencies often aim at restoring the process of providing health care and subsequently providing human and material resources for sustainable health system strengthening in replacement of sporadic foreign emergency interventions. In many cases, emergency assistance specifically target impoverished and vulnerable populations affected by the instable context and are not always designed to respond to health system strengthening needs in non-fragile state contexts. A potential effect of emergency assistance may be that population expectations for health services may increase in the short-run resulting in negative perceptions in the post-assistance period when Government and long-term assistance strategies replace short-term emergency assistance. Yet providing effective support for systems strengthening in post-conflict recovery processes, including improved health-seeking behavior, is even more challenging than in contexts where stability and peace exist (Sondorp & Scheewe 2012; WHO 2005). Therefore, outlining the determinants of treatment-seeking behavior in such a context is an essential step towards identifying the interventions that improve health outcomes, both in the short- and long-run (Sondorp & Scheewe 2012; WHO 2005). In Sud-Kivu, several unpublished studies have been conducted by international NGOs on their interventions (Aide Medicale Internationale, 2007, 2008, 2010). Nevertheless, these studies have been primarily descriptive in nature. This study is to the best of our knowledge the first attempt to deeply investigate treatment seeking behavior in the post-conflict, fragile state setting of Sud-Kivu, DRC.

**Study context**

Sud Kivu (SK) region in the Democratic Republic of Congo (DRC) (see Figure 1) is divided into 5 health districts (Bukavu, Centre, Nord, Sud and Ouest), comprising a total of 34 health zones (HZ). For this study five out of the nine health zones located in the Sud district were
selected for the survey: Fizi, Kimbi-Lulenge, Hauts-Plateaux d’Uvira, Lemera and Nundu (see Figure 1). These HZ comprise 797,420 people which represent 16% of the region’s population. Bordering Lake Kivu, the study zone is geographically diverse, including both coastal plains and peninsulas where cholera is still endemic, and high plateaus reaching 2,900 meters in altitude. All 5 health zones are remote and difficult to access. According to safety classifications by the regional Health Inspection Office (IPS), four of the health zones were classified as in emergency, while Nundu was ranked as in transition. While stability remained relatively fragile, recent assessments have noted that the region has become stabilized enough to be considered as a post-conflict area (GTZ 2010; UNHCR/UNOCHA 2009). At the time that the study was conducted in early 2010, the United Nations’ mission in the DRC was changing its agenda from peace keeping to peace stabilization.

The health system remains extremely weak in the region. The majority of health areas only have one primary health care facility, resulting in limited options for households to choose when seeking treatment. There is no normalized circuit for official drug provision and the competency of health care providers is poor, particularly when confronted with complicated illnesses (Aide Médicale Internationale 2010). Many international NGO reports have stated that the quality of care plummeted immediately after their disengagement due to drug shortages, increases in service fees, and desertion of health personnel who benefited from training and salary supplements (Aide Médicale Internationale/Malteser 2007; Aide Médicale Internationale/Malteser 2008; Aide Médicale Internationale/Malteser 2009).

<Figure 1>
Data from the health information system indicate that the under-5 mortality rate of the province is estimated at 120 deaths per 1000 live births, and the regional maternal mortality ratio is one of the highest in the country (Ministère de la Santé 2008).

The main objective of this study is to investigate factors influencing treatment-seeking behavior in a post-conflict context where intensive development and emergency health sector assistance are highly prevalent. For this study, treatment-seeking behavior is defined as actions undertaken when sick to get better, including use of both formal sector care options such as health centers and hospitals, and informal care alternatives such as self-treatment and traditional and religious healers. The rest of the paper is organized as follows: Section 3 provides some background on health care demand, Section 4 presents the study’s methodology, Section 5 presents the study’s results, and Section 6 discusses the results within the context of the broader literature and concludes.

**Background on health care demand**

In considering that demand for health care is optional, discrete and sequential, frameworks for analyzing health care demand should encompass the multitude of therapeutic options, including contextual factors, an individual considers when making decisions related to health-seeking behavior. Consequently, such analyses should be conducted through discrete choice modeling which allows for consideration of these determinants in the process that leads to choosing a particular type of health care (Cisse et al. 2004; Dow 1996).

The discrete choice model assumes that the consumer purchases good health to benefit from or increase his human capital utility (Dow 1996). In the context of this study, a household that
encounters an illness episode must first choose whether to seek health care or not. If the
decision to seek treatment is made, the individual must make a choice on the type of care to
seek among the available therapeutic options. Within the context of Sud Kivu, the available
options include primary health care (Public Health Center (PHC) or polyclinic), secondary
care (hospital), traditional or informal care (traditional or religious healer) and self-treatment
(buying drugs in the informal sector and treating within the household without outside
assistance) (see Table 1).

Certain factors, such as treatment costs and travel time, directly influence levels of observed
health care consumption. The decision to seek health care ultimately decreases the
household’s opportunity to consume other goods and services or take part in other activities.
The opportunity costs for patients and other household members (forgone resources or time
due to treatment) may also be decisions related to health seeking behavior (Dow 1996). This
entails that the availability and perceived quality of the various care options should also be
taken into account to wholly grasp the factors encompassing the decision-making process. In
taking into consideration these factors, the household chooses a therapeutic alternative that
may generate the highest utility under a given set of constraints. Precisely, the utility
associated to each of the alternatives \( j \) can be formalized by the following expression:

\[
(A.1) \quad U_{ij} = U_{ij}(S_{ij}, C_{ij}) + e_{ij}
\]

where \( S_{ij} \) is the human capital increase of the household \( i \) emanating from the consumption of
health care of the alternative \( j \), \( C_{ij} \) is the level of consumption of other goods within the
household made possible after health care expenditures, and \( e_{ij} \) is the error term representing
unobserved factors explaining the utility gained through the health care option $j$. Human capital improvement $S_{ij}$ is correlated to individual or household characteristics $X_i$ (education, income, age, etc.) and supply factors $Q_j$ (availability of services, quality of care, etc.).

$$\text{(A.2)} \quad S_{ij} = S_{ij}(X_i, Q_j)$$

with $S_{ij} = s_{ij}$ for health care consumption, and $S_{ij} = 0$ for the non-consumption option. $C_{ij}$ is expressed as follows:

$$\text{(A.3)} \quad C_{ij} = R_i - P_j$$

with $C_{ij} = c_{ij}$ for the health care consumption, and $P_j = 0$ and $C_{ij} = R_i$ for non-consumption option. $R_i$ is the household’s income and $P_j$, the health care costs.

For this paper, only direct costs for health care were included for $P_j$: consultation and service fees, laboratory fees, drugs, accommodation and transportation fees related to the illness episode where care was sought.

The term $U_{ij}$ of Equation (A.1) is defined as a conditional utility function. It formalizes the conditional utility of the household which has adopted the alternative $j$. The household then maximizes that function by choosing the alternative that yields the highest utility, $U^*$. $U^*$ can be expressed as follows:

$$\text{(A.4)} \quad U^* = \text{Max} (U_{PC}, U_{SH}, U_{TC}, U_{ST})$$
with “PC” equal to primary health care, “SH” equal to secondary care, “TC” equal to informal care (traditional/religious health care), and “ST” for self-treatment.

Early studies on health care demand focusing on out-of-pocket payments concluded that there was no significant correlation between demand, price and income (Manning et al. 1987). These findings have been refuted by Gertler and Van der Gaag (1988) who have shown through use of discrete choice modeling that there indeed exists a negative and significant correlation between health care demand and price when patients pay out-of-pocket (Gertler & Van Der Gaag 1988). Methodological shortcomings could have been responsible for these contradictions. Cisse et al. (2004) and Glick et al. (2000) suggested that it would have been more relevant to specify a model by income categories to test any cost recovery effect (Cisse et al. 2004; Glick et al. 2007). Moreover, the specification of a linear model does not allow for modeling the income effect (Gertler & Van Der Gaag 1988). In turn, a quadratic model was proposed (linear for health and quadratic for consumption), aimed at taking into account the price-elasticity and the propensity to pay (Glick et al. 2007). Based on this historical evolution of modeling health care demand in developing countries, for this study a mixed logit model was applied (Glick et al. 2007; Kaija & Okiira 2006), which is a model usually used to represent choice between mutually exclusive options (Mayhew 2010).

Survey methods

Data collection, timeline and study population

The data used are from a randomized cluster survey, jointly conducted by Sud Kivu’s regional Ministry of Health and the international NGO Aide Medicale Internationale. Health areas were used as the primary sampling unit. The sample included 3,979 households from 101 clusters out of 119 total health areas (Table 2). Data collection took place between February
and March 2010. The sample was 2.6% of the total population with a response rate of 82%.

The sample size was decided by considering an error margin of 5% and a design effect of 2. An extra 10% of the theoretical sample was then added to anticipate for non-responses. All health areas of the health districts targeted were first included in the sampling. From each health area, surveyors were instructed to randomly select 30 households. Surveyors applied on the field a sampling scheme consisting of randomly choosing a direction from the center of the health area (village) and then use a table of random numbers to select the first and subsequent households up to reaching the number of 30 whenever possible. When a health area could not be reached due to security concerns, no replacement was suggested as areas needed a long process of security-check before the surveyor could be deployed there. For each household sampled, the household head was the respondent. In the absence of the household head, the most appropriate person over the age of sixteen was interviewed. If these requirements were not met surveyors were instructed to select the next household. During the field work phase, data collection encountered several interruptions due to security issues and sporadic military confrontations.

<Table 2>

Survey content

The survey gathered relevant information across 3 main domains. Section 1 collected information on socio-demographic characteristics of household members, as well as socioeconomic status of the household including income earned through each economic activity of household members. Section 2 collected information on households’ care seeking behavior namely for curative care and maternal and child health services such as antenatal care and institutional deliveries. Data was collected with regards to the existence of any disease/pregnancy in the household, and if any illness episodes occurred during a 30 day
recall period prior to the day of the interview. If any treatment was sought, information on the type and cost of care received was also collected. The duration of the illness was collected to classify whether it was chronic or not. Section 3 collected information on child mortality.

Model specification and data analysis

The dependent variable used to model this outcome of interest, choice of health care consumption, is categorical and comprised of the four alternatives for health services available for a household in the study area of Sud Kivu. Statistical techniques for the analysis of discrete choices have been in use with increasing regularity in health analyses. In this paper, we formulate a mixed multinomial model of health care for the choice among four alternatives: primary health care, secondary health care, self-treatment and traditional care. In the tradition of utility-maximization models, the utility $u_i$ that a household ($i=1, \ldots, N$) associated with an alternative $j$ among $J$ possibilities may be written as follows:

$$(A.5) \quad u_{ij} = \alpha_i + x_{ij}\beta + e_{ij}$$

Where $\alpha_i$ is a scalar utility term representing household $i$’s intrinsic preference for alternative $j$. $x_{ij}$ is a vector of observed variables affecting the utility of household $i$ for alternative $j$. $\beta$ is a corresponding vector of coefficients and $e_{ij}$ is a stochastic component of utility. One can rewrite this component as $e_{ij} = z_{ij}\eta_i + \epsilon_{ij}$, where $z_{ij}$ is a vector of characteristics that can vary over households, alternatives, or both. $\epsilon_{ij}$ is an observed random term that represents the idiosyncratic effect of omitted variables that are IDD over households and alternatives. $\eta_i$ is a vector of random terms with mean 0 that varies over households according to the distribution $g(\eta_i/\Omega)$ where $\Omega$ are the fixed parameters of the distribution $g$. We then write the utility that household $i$ gets from alternative $j$ as
In this study, primary health care was considered to be the baseline alternative, that is, all other treatment options \((K)\) will be interpreted relative to it. The probability that a patient consumes treatment category \(j\), is formalized by the following equation:

\[
(A6) \quad u_{ij} = \alpha_i + x_i \beta + (z_i \eta_i + \varepsilon_{ij})
\]

The logit probability must be integrated over all values of \(\eta\) weighted by the density of \(\eta\).

\[
(A7) \quad \Pr(y_i = j / \eta) = p_{ij} = \frac{\exp(\alpha_i + x_i \beta + z_i \eta_i)}{\sum_{h \in x} \exp(\alpha_i + x_i \beta + z_i \eta_i)}
\]

\[
(A8) \quad \Pr(y_i = j) = p_{ij} = \int_{\eta} \frac{\exp(\alpha_i + x_i \beta + z_i \eta_i)}{\sum_{h \in x} \exp(\alpha_i + x_i \beta + z_i \eta_i)} g(\eta / \Omega) \, d\eta
\]

In addition to the common explanatory variables used to model health care demand in developing countries (time spent to reach the nearest health facility, education, income, number of children in the household, household size, duration of illness). The time spent to reach the nearest health facility was asked to respondents who were asked to provide the name of the facility. Household’s income was measured in this survey by first listing all existing activities and income sources and then asking to the household whether they participate in such activities and how much they earned monthly per activity.

Household medical expenditures were collected in the household and introduced in the model (Cisse et al. 2004).
An indicator titled ‘foreign assistance’ was also created, which takes the value of “1” in the case of existence of emergency assistance in the health area and “0” if not. Emergency assistance includes high intensity but short-term supply-side support for health service delivery to vulnerable populations (for example: *Aide Medicale Internationale* and *Medecins Sans Frontieres* interventions in Sud Kivu). The other type of health sector assistance occurring in the study zone included health system strengthening operations. It encompasses longer-term projects designed to address systemic issues in improving health service delivery (for example: *GIZ* and *Malteser* interventions in Sud Kivu). Some other health areas were not benefitting from any kind of foreign support at the time of the study. In order to generate this variable, the authors used the regional Health Inspection Office’s 2010 codification file for donor assistance activities at each health facility in the region. In the area covered by this study, in 2010 about 19.4% of health areas received no foreign assistance, 40.2% benefited from emergency assistance, 40.4%, from systems development (IPS 2010).

**Ethics**

At the time of the study there was no functional ethical committee in the area. Administrative authorization was provided by the Ministry of Health, who released and distributed official letters to inform all the civilian and military authorities of the region and sub-regions. Respondents were required to provide verbal consent prior to partaking in the survey.

**Results**

*Household demographic and socio-economic status (SES) characteristics*

About 32% of respondents had no formal education (Table 3). The average household size was 6.4 individuals among which, about 1.5 was under the age of 5. In total, around 23.4% of the population was under 5 years old. About 90% of the population was living in extreme
monetary poverty as defined by the World Bank: US$1 for extreme poverty and US$2 for poverty (World Bank 2008). Around 30% of households were identified as vulnerable (DRR). The protestant religion is the most represented in the sample (60.0%).

<Table 3>

_Treatment seeking behavior_

Among those who sought any treatment for their latest illness episode, approximately 73.6% of households visited as their first option a primary health care center, while 11.4% chose a secondary care hospital. There were observed differences in geographical access to care for different types of care, especially in primary care. Among those who sought any treatment, around 76.3% of households living at less than 2 hours from a primary health facility sought care at a primary health facility, while only 54.8% of those living at more 2 hours did.

Among those who sought any type of care, only 3% of respondents visited traditional or religious healers as their first choice of care. While only a small proportion of children under-5 benefited from services from secondary care facilities (8.6%), the proportion more than doubled for adults aged 15 and above (17.0%). Except for higher education (85.5%), there were no significant differences for lower levels of education attainment. Households who identified that religion was very important or important in their life visited primary care facilities 76.2% and 68% of the time, respectively. Poor households used primary care the most (85.2%), while non-poor households used secondary care the most (18.6%). Extremely poor households used secondary care more than poor households (11.9% vs. 2.2%, respectively). Residents used primary care the most (76.3%), followed by repatriates (26.1%). Certain types of illnesses were associated with the type of care sought. For example,
households whose members experienced convulsions were more likely to use informal sector care, while those who experienced fever or diarrhea used formal sector health services.

For the first type of care sought for a given illness, overall households spent on average US$6.6. For specific types of care, households spent on average US$5.2 for care at primary care facilities, US$15.5 at secondary care facilities and US$3.8 for traditional care and/or self-treatment (see Table 5).

**Multivariate results**

The mixed multinomial logit model results are displayed in Table 6. Results presented are in relation to primary care. Both supply and demand side factors are included in model estimates. Logistic regressions were conducted for health areas with emergency assistance and for health areas without emergency assistance (development or no foreign assistance).

**Supply side factors**

In health zones with emergency assistance, increases in the time that a household would spend to reach the nearest health center increases the likelihood that they would chose a secondary care facility over a primary care one. (Coef.=0.002, P<0.01). The same preference is observed in the case of self-treatment (Coef.=0.004, P<0.01); or traditional care (Coef.=0.005, P<0.01). Besides that, increases in the cost of secondary care are of no effect on the likelihood that a household would prefer secondary care over primary care. The same situation is observed in the case of self-treatment. When it comes to traditional care, increases in the cost of
traditional care decreases the likelihood that a household would prefer traditional care over primary one (Coef.=-0.001, P<0.01).

In health zones without emergency assistance, increases in the time that a household would spend to reach the nearest health center has no significant influence on the likelihood that they would chose a secondary care facility over a primary care one. Meanwhile, in the same type of health zones, increases in the time that a household would spend to reach the nearest health center increases the likelihood that they would chose self-treatment over a primary care one (Coef.=0.004, P<0.01). Moreover, increases in the costs of secondary care are also of no effect on the likelihood that a household would prefer secondary care over primary care. Nevertheless, in the case of self-treatment and traditional care, increases in the costs of these two types of care decrease the likelihood that a household would chose self-treatment (Coef.=-0.003, P<0.01) and traditional care (Coef.=-0.002, P<0.01) over primary care, respectively.

**Demand side factors**

When exposed to emergency assistance, increase in the level of education achieved by the household’s head decreases the probability that they would chose traditional care over primary one (Coef.=-0.482, P<0.05). Educational attainment has no effect in the choice of secondary care or self-treatment over primary care. An increase of the number of children aged less than 5 years in the household actually deter the likelihood that they choose secondary health care over primary care (Coef.=-0.181, P<0.1). In all other health branches, the increase in the number of children aged less than 5 years is of no effect. In the other hand, increases in the size of the household also increase the probability that they choose secondary care over primary care (Coef.=0.197, P<0.01). The same outcome is observed in the case of the preference to self-treatment over primary health care as a consequence of an increase in
the size on the household (Coef.=0.115, P<0.05). An increase in illness duration highly increases the likelihood that the household opts for traditional care over primary care (Coef.=0.956, P<0.01). Illness duration is of no effect in any other sets of choices of health care. Finally, an increase in household revenue would increase the probability of the preference of secondary care over primary care (Coef.=0.041, P<0.1). Household revenue does not significantly influence any other options in the set of health care choices.

In the absence of foreign emergency assistance, increases in educational attainment achieved by the household’s head increase only the likelihood that it would choose self-treatment over primary care (Coef.=0.493, P<0.01). An increase in illness duration increases the likelihood that a household chooses secondary care (Coef.=0.463, P<0.05) and again traditional care over primary care (Coef.= 0.678, P<0.1), respectively. Finally, an increase in household revenue reduces the relative probability that it would choose secondary care over primary care (Coef.=-0.127, P<0.01). Without any foreign assistance, no other choices option is significantly impacted by the revenue of the household.

Discussion

The objective of this study was to identify factors that influence health care-seeking behavior in a poor, rural, post-conflict area in Sud-Kivu, DRC, where emergency and health system strengthening interventions are extensively implemented with the second progressively replacing the first. By applying a mixed multinomial logit model, the study analyzed the relationship between household utilization of formal (primary and secondary care facilities) and informal (traditional/religious healers) care options and contextual factors such as type of foreign assistance, household socio-economic status and geographical proximity to health center services. The following key results highlight the existing challenges in improving and maintaining access and utilization of professional, formal sector health services in the fragile post-conflict context of Sud-Kivu.
**Access to health care options that benefit from emergency and development assistance**

The results suggest that within fragile state settings such as Sud-Kivu, foreign emergency support increases the preference to primary health care relative to secondary care, self-treatment and traditional care. This entails that the withdrawal of emergency support that are sometimes replaced by system strengthening programs actually reduces the effectiveness of primary care as well as its preference among the population. Actually within the frame of emergency support, health care is almost free with more adequate inputs that directly foster the quality of care provided, especially at the primary level. After this support disengages, these resources vanish at the same time that the costs of care increase.

**Geographical access to formal sector health care**

The study identified that either with or without emergency assistance; the harder geographical access to public health centers is the higher is the likelihood of seeking secondary care as well as unregulated care from the informal health sector over primary care (Schieber et al. 2012). Such overstepping in the health system pyramid and reliance to unregulated care is not only cost-ineffective but hazardous in a public health perspective.

**Household characteristics**

Certain demographic characteristics of households are also found to be associated with treatment seeking behavior. Higher educational attainment is associated with reduced use of traditional care over primary care, especially in times of emergency support. In times of absence of emergency support, higher educational attainment rather favors self-treatment over primary care.
The more children under five years of age in the household, the more likely they use primary care over secondary care in times of emergency support. On the contrary, when considering the whole household size secondary care and self-treatment become prevalent. Actually, this result suggests that the more adults are in the household, the more likely the household would prefer secondary care or self-treatment at first intention over primary care. Therefore, presumably the symptoms influence the choice of the therapy – as epistemologically, children and adults often suffer from divergent types of illnesses.

Chronic diseases increase very significantly the likelihood to demand for traditional care or secondary care over primary care, be it or not in times of emergency support. This result demonstrates, as asserted by O’Donnell (2007) that by lack of appropriate care for chronic diseases, patients can develop a certain habit-forming with their pain (O’Donnell 2007) or by despair, seek for informal therapy when all steps of formal care are crossed unsuccessfully. Actually emergency support usually mostly target maternal and child health services rather than chronic diseases. We should also note that the incidence (3%) of traditional care as a chosen option seems underestimated. The reality of the context suggests that many households use several types of treatment and may combine self-treatment with formal sector care. In the case where several types of treatment were used, first sector of care visited was recorded in the questionnaires.

Higher household income is positively associated with preferring secondary care even in times of emergency support; but turns negative in case of no emergency support. This result suggests that without foreign emergency assistance, the ability of high income household to take in the first place highest quality standard available during emergency assistance (secondary care) becomes inopportune.
A decrease of preference to self-treatment and traditional care is noted as long as the cost of those care is high be it or not in times of emergency assistance. Moreover, the absence of emergency assistance further decreases the preference associated with the costs of those types of unregulated care. This result suggests that unconventional health care remains actually significantly price-elastic.

**Study limitations**

This study has several potential limitations. First, the study did not take into account indirect costs (opportunity costs) that may potentially influence demand for health care, especially secondary hospital care. Also, a few sampled households, especially in the Kimbi-Lulenge health zone, could not be reached due to insecurity matters or sporadic military confrontations. This might have possibly biased the study sample. Also, as this study is a cross-sectional design, only associations can be observed, rather than any causal effect.
Conclusion and recommendations

The main lesson to draw from the results of this study is the following: household utilization of the available care options is still largely influenced by exposure to intensive foreign assistance programs and, to some extent, to demographic (adulthood) and some socioeconomic status for secondary care. Evidence is emerging that [cost-]effective and equitable health services may be a central contributor to state legitimacy (Haar & Rubenstein 2012; Sondorp & Scheewe 2012), and that all too often, health interventions in fragile and conflict-affected states are limited to humanitarian relief, which does not advance either health systems development or state legitimacy (Haar & Rubenstein 2012). Performance-based Financing (PBF) is an approach to structure the flow of resources aimed at improving health service delivery through community involvement and payments based on agreed-upon targets and verified results (Basinga et al. 2011; Soeters et al. 2006; Soeters et al. 2011). It has also been suggested that PBF may be more cost-effective than other traditional donor interventions (Soeters et al. 2011). In addition to PBF, the Sector Wide Approach (SWAp), which brings together governments, donors and other stakeholders, under a set of operating principles and under government leadership, can contribute towards developing a single sector policy (Foster et al. 1999). The combination of these two approaches could therefore be a way of improving both the sustainability of delivery quality health care services as well as state legitimacy in fragile state settings such as the Sud Kivu region in the Democratic Republic of Congo.
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### Table 1: Categorization of the health care

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<thead>
<tr>
<th>Type of care</th>
<th>Description</th>
<th>Foreign support</th>
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<tr>
<td>Primary care</td>
<td>Minimum healthcare package: preventive care and simple case treatment mostly on the basis of predefined therapeutic protocols diagnosed by other health staff than doctors</td>
<td>Primarily supply-side subsidies and/or technical assistance, or providing primary and/or secondary care including drug delivery and sometimes foreign staff.</td>
</tr>
<tr>
<td>Secondary care</td>
<td>Complementary health care package: treatment of more complicated cases with complementary examination, often provided by physicians</td>
<td></td>
</tr>
<tr>
<td>Traditional or informal care</td>
<td>Care or drugs provided by traditional or religious healers.</td>
<td>No Support</td>
</tr>
<tr>
<td>Self-treatment</td>
<td>Purchasing drugs in the informal sector (private pharmacies, ambulatory drug sellers, and treating within the household without outside assistance</td>
<td>No support</td>
</tr>
</tbody>
</table>

Source: authors

### Table 2: Data collection

<table>
<thead>
<tr>
<th>Health zone</th>
<th>Visited</th>
<th>Existing</th>
<th>Gap</th>
<th>Forecasted</th>
<th>Interviewed</th>
<th>Response rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fizi</td>
<td>27</td>
<td>30</td>
<td>3</td>
<td>990</td>
<td>850</td>
<td>85.9</td>
</tr>
<tr>
<td>Hauts Plateaux</td>
<td>16</td>
<td>22</td>
<td>6</td>
<td>960</td>
<td>762</td>
<td>79.4</td>
</tr>
<tr>
<td>Kimbi Lulenge</td>
<td>19</td>
<td>24</td>
<td>5</td>
<td>1050</td>
<td>771</td>
<td>73.4</td>
</tr>
<tr>
<td>Lemera</td>
<td>19</td>
<td>22</td>
<td>3</td>
<td>990</td>
<td>753</td>
<td>76.1</td>
</tr>
<tr>
<td>Nundu</td>
<td>20</td>
<td>21</td>
<td>1</td>
<td>870</td>
<td>843</td>
<td>96.9</td>
</tr>
<tr>
<td>Overall</td>
<td>101</td>
<td>119</td>
<td>18</td>
<td>4860</td>
<td>3979</td>
<td>81.9</td>
</tr>
</tbody>
</table>

Source: authors

### Table 3: Household demographic and socio-economic characteristics per Health Zone

#### Age group (%)

<table>
<thead>
<tr>
<th>Age group (%)</th>
<th>Fizi</th>
<th>Hauts Plateaux</th>
<th>Kimbi Lulenge</th>
<th>Lemera</th>
<th>Nundu</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 years</td>
<td>23.2</td>
<td>24.1</td>
<td>24.6</td>
<td>23.7</td>
<td>22.6</td>
<td>23.4</td>
</tr>
<tr>
<td>5-14 years</td>
<td>32.1</td>
<td>33.4</td>
<td>31.1</td>
<td>32.2</td>
<td>30.9</td>
<td>31.7</td>
</tr>
<tr>
<td>15 years +</td>
<td>44.8</td>
<td>42.5</td>
<td>44.3</td>
<td>44.1</td>
<td>46.5</td>
<td>44.8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

#### Average household size

<table>
<thead>
<tr>
<th>Average household size</th>
<th>Fizi</th>
<th>Hauts Plateaux</th>
<th>Kimbi Lulenge</th>
<th>Lemera</th>
<th>Nundu</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any age</td>
<td>6.8</td>
<td>5.8</td>
<td>6.1</td>
<td>6.3</td>
<td>6.4</td>
<td>6.4</td>
</tr>
<tr>
<td>Under five years old</td>
<td>1.6</td>
<td>1.4</td>
<td>1.5</td>
<td>1.5</td>
<td>1.4</td>
<td>1.5</td>
</tr>
</tbody>
</table>

#### Education of respondent (%)

<table>
<thead>
<tr>
<th>Education of respondent (%)</th>
<th>Fizi</th>
<th>Hauts Plateaux</th>
<th>Kimbi Lulenge</th>
<th>Lemera</th>
<th>Nundu</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never attended</td>
<td>31.5</td>
<td>38.7</td>
<td>19.2</td>
<td>37.6</td>
<td>36.4</td>
<td>32.1</td>
</tr>
<tr>
<td>Basic</td>
<td>37.7</td>
<td>35.4</td>
<td>44.2</td>
<td>39.1</td>
<td>34.1</td>
<td>38.1</td>
</tr>
<tr>
<td>Secondary</td>
<td>29.4</td>
<td>24.7</td>
<td>35.1</td>
<td>22.7</td>
<td>28.1</td>
<td>28.6</td>
</tr>
<tr>
<td>High</td>
<td>0.9</td>
<td>0.5</td>
<td>0.9</td>
<td>0.3</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Don’t Know (DK)</td>
<td>0.5</td>
<td>0.7</td>
<td>0.5</td>
<td>0.3</td>
<td>1.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>-------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td><strong>Religion (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animist</td>
<td>6.7</td>
<td>0.1</td>
<td>1.7</td>
<td>0.3</td>
<td>4.1</td>
<td>3.4</td>
</tr>
<tr>
<td>No religion</td>
<td>4.0</td>
<td>0.4</td>
<td>3.1</td>
<td>2.4</td>
<td>4.9</td>
<td>3.5</td>
</tr>
<tr>
<td>Catholic</td>
<td>28.0</td>
<td>12.9</td>
<td>26.9</td>
<td>23.8</td>
<td>26.4</td>
<td>25.4</td>
</tr>
<tr>
<td>Muslim</td>
<td>10.8</td>
<td>0.5</td>
<td>3.5</td>
<td>2.3</td>
<td>4.2</td>
<td>5.5</td>
</tr>
<tr>
<td>Protestant</td>
<td>45.3</td>
<td>85.8</td>
<td>63.2</td>
<td>71.2</td>
<td>59.4</td>
<td>60.0</td>
</tr>
<tr>
<td>Others</td>
<td>5.3</td>
<td>0.3</td>
<td>1.5</td>
<td>0.4</td>
<td>1.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Household status (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resident</td>
<td>65.1</td>
<td>90.9</td>
<td>70.1</td>
<td>76.9</td>
<td>62.5</td>
<td>69.6</td>
</tr>
<tr>
<td>Displaced</td>
<td>16.3</td>
<td>8.2</td>
<td>3.4</td>
<td>5.2</td>
<td>17.4</td>
<td>11.7</td>
</tr>
<tr>
<td>Repatriates</td>
<td>12.9</td>
<td>0.7</td>
<td>0.8</td>
<td>0.5</td>
<td>11.1</td>
<td>7.1</td>
</tr>
<tr>
<td>Returned</td>
<td>5.7</td>
<td>0.2</td>
<td>25.7</td>
<td>17.4</td>
<td>9.1</td>
<td>11.7</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Wealth status (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely poor (&lt;$1/day)</td>
<td>92.9</td>
<td>97.6</td>
<td>91.8</td>
<td>99.2</td>
<td>76.0</td>
<td>89.9</td>
</tr>
<tr>
<td>Poor ($1-$2/day)</td>
<td>4.3</td>
<td>1.7</td>
<td>6.9</td>
<td>0.4</td>
<td>17.0</td>
<td>7.1</td>
</tr>
<tr>
<td>Not poor (&gt;=$2/day)</td>
<td>2.8</td>
<td>0.7</td>
<td>1.3</td>
<td>0.4</td>
<td>7.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: authors

Table 4: Health facilities visited by households among those applied any treatment, in the first choice, for their latest illness episode (%)

<table>
<thead>
<tr>
<th>Education</th>
<th>Primary care</th>
<th>Secondary care</th>
<th>Traditional or religious healer</th>
<th>Self-treatment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never attended</td>
<td>73.1</td>
<td>11.7</td>
<td>3.1</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>Basic</td>
<td>74.1</td>
<td>11.1</td>
<td>3</td>
<td>11.7</td>
<td>100</td>
</tr>
<tr>
<td>Secondary</td>
<td>72</td>
<td>12.5</td>
<td>2.7</td>
<td>12.7</td>
<td>100</td>
</tr>
<tr>
<td>High</td>
<td>85.5</td>
<td>7</td>
<td>0</td>
<td>7.5</td>
<td>100</td>
</tr>
<tr>
<td>Don’t Know (DK)</td>
<td>77.5</td>
<td>0</td>
<td>11.1</td>
<td>11.4</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place of religion in household’s life</th>
<th>Very important</th>
<th>Important</th>
<th>Not so important</th>
<th>Not important at all</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>极为重要</td>
<td>76.2</td>
<td>10.6</td>
<td>1.9</td>
<td>11.3</td>
<td>100</td>
</tr>
<tr>
<td>重要</td>
<td>68</td>
<td>13.4</td>
<td>4.6</td>
<td>14.1</td>
<td>100</td>
</tr>
<tr>
<td>不重要</td>
<td>57</td>
<td>12.1</td>
<td>13.9</td>
<td>17</td>
<td>100</td>
</tr>
<tr>
<td>极不重要</td>
<td>35.4</td>
<td>49.7</td>
<td>1.8</td>
<td>13.1</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poverty according to the World Bank’s thresholds</th>
<th>Extremely poor</th>
<th>Poor</th>
<th>Not poor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>极度贫穷</td>
<td>72.7</td>
<td>11.9</td>
<td>3.1</td>
<td>12.3</td>
</tr>
<tr>
<td>贫穷</td>
<td>85.2</td>
<td>2.2</td>
<td>2.4</td>
<td>10.2</td>
</tr>
<tr>
<td>非贫穷</td>
<td>70.4</td>
<td>18.6</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

| Residential status | }
Resident 76.3 10.3 3 10.4 100
Displaced 73.1 11.7 2.9 12.3 100
Repatriates 58 26.1 4.7 11.2 100
Returned 69.4 7.5 2.1 21 100

Patient’s age
< 5 78.4 8.6 1.4 11.6 100
5 - 14 years 71.4 8.8 3.7 16.1 100
15 and + 68.3 17 4.4 10.3 100
DK 63.1 0 25 11.9 100

Time spent to get to the PHC
More than 2 hrs 54.8 12.7 6.4 26.1 100
Less than/equal to 2 hrs 76.3 11.3 2.5 9.9 100

Illness
Diarrhea 83.3 9.4 3.9 3.3 100
Fever 83.6 9 4.1 3.2 100
Convulsion 65.3 10.1 22.3 2.1 100
Overall 73.6 11.4 3 12 100

Source: authors

Table 5: Cost of care and place of consultation (in US$ = 900 Congolese Francs)

<table>
<thead>
<tr>
<th>Other cost of care</th>
<th>Cost of transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health center</td>
<td>4.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Health post</td>
<td>8.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Hospital</td>
<td>14.6</td>
<td>1.0</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>3.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Traditional healer</td>
<td>2.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Prayer room</td>
<td>1.0</td>
<td>0.1</td>
</tr>
<tr>
<td>Private clinic</td>
<td>10.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Overall</td>
<td>5.9</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Source: authors

Table 6: Model of curative health care demand in 5 HZ in SK, DR Congo [Basis: Primary care]

<table>
<thead>
<tr>
<th></th>
<th>Emergency assistance (1)</th>
<th>Development assistance or no foreign assistance (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef</td>
<td>se</td>
</tr>
<tr>
<td>Supply side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary health care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to nearest health center</td>
<td>0.002***</td>
<td>0.001</td>
</tr>
<tr>
<td>Cost of secondary care</td>
<td>0.000*</td>
<td>0.000</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Self-Treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to nearest health center</td>
<td>0.004***</td>
<td>0.001</td>
</tr>
<tr>
<td>Cost of self-treatment</td>
<td>-0.000***</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Traditional care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to nearest health center</td>
<td>0.005***</td>
<td>0.001</td>
</tr>
<tr>
<td>Cost of traditional care</td>
<td>-0.001***</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Demand side**

**Secondary health care**
- Educational attainment: 0.159, 0.137, 0.090, 0.117
- Number U5 in household: -0.181*, 0.094, 0.018, 0.091
- Household size: 0.197***, 0.045, 0.028, 0.041
- Illness duration: 0.259, 0.214, 0.463**, 0.189
- Household revenue: 0.041*, 0.021, -0.127***, 0.043

**Self-Treatment**
- Educational attainment: 0.088, 0.163, 0.493***, 0.182
- Number U5 in household: -0.153, 0.116, 0.180, 0.134
- Household size: 0.115**, 0.054, -0.090, 0.064
- Illness duration: -0.319, 0.281, -0.196, 0.320
- Household revenue: 0.012, 0.037, -0.033, 0.033

**Traditional care**
- Educational attainment: -0.482**, 0.229, -0.153, 0.253
- Number U5 in household: 0.144, 0.169, 0.052, 0.196
- Household size: -0.053, 0.082, -0.118, 0.088
- Illness duration: 0.956***, 0.349, 0.678*, 0.396
- Household revenue: 0.037, 0.055, 0.010, 0.027

Log-Likelihood: -716.110, -736.300
Pseudo R2: 0.546, 0.689
Number of observations (weighted): 4552, 6840

Source: authors
Figures

Figure 1: Map of the areas surveyed in Sud-Kivu, Democratic Republic of the Congo

Note: the areas marked with “S” are those that were surveyed
Figure 2: Structure of health care demand

Household-reported illness

Self-treatment  Traditional or religious healer  Primary care  Secondary care

Source: authors