

**Can we predict out-of-pocket expenditures on HIV/AIDS on the  
basis of macro indicators?**

**Evidence from the Latin American  
and Caribbean Region**

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## **Abstract**

Out-of-pocket expenditure on HIV/AIDS services and goods is the component in National HIV/AIDS Accounts that is most difficult to measure. Despite the pressing need for national data on out-of-pocket spending on HIV/AIDS, at present, for only a few countries in the world data on out-of-pocket expenditure on HIV/AIDS are available; the majority of them for the Latin American and Caribbean (LAC) region. Using 1999-2002 aggregated data for 20 LAC countries from SIDALAC, the paper examines levels out-of-pocket expenditure on HIV/AIDS in LAC countries and explores macro-indicators that could predict out-of-pocket expenditure on HIV/AIDS in countries that lack out-of-pocket expenditure statistics on HIV/AIDS. The selection of predicting variables was guided by i) the out-of-pocket expenditure model, an adapted version of the behavioral model for medical service utilization by Andersen, and ii) by the availability of data for these macro indicators in international databases. Results for the LAC region show average out-of-pocket spending per persons living with HIV/AIDS (PLWHA) of 196 US\$ (PPP, const.1995), ranging from 6 to 1099 US\$(PPP, const.1995) in Haiti and Uruguay respectively. For six countries out-of-pocket expenditure per PLWHA could be labeled 'catastrophic'. Bi-variate analysis was followed by multiple-variable regression analysis. Three types of the dependent variable - national total, per capita and per case out-of-pocket expenditure on HIV/AIDS - were calculated for testing the macro variables. Not surprisingly, the model's need or epidemiologic indicator – the number of HIV/AIDS cases - is strongly and positively associated with total national out-of-pocket expenditure on HIV/AIDS in the 20 LAC countries for the period 1999-2002. Another convincing predictor is the number of physicians per 10,000 population. Each of these predictors may be used in combination with the per capita total health expenditure or the percentage urban population.

**Keywords:** Out-of-pocket expenditure, HIV/AIDS, Latin America and the Caribbean.

## 1 Introduction

There are three main concerns that justify the analysis of out-of-pocket expenditure on HIV/AIDS. The first concern is the sometimes high level of out-of-pocket expenditure on HIV/AIDS and the substantial share of out-of-pocket expenditure on health in overall spending on health care. WHO (2003) reports that in middle-income and low-income economies out-of-pocket spending is often second only to government expenditures in terms of size and share of total health spending. In the absence of social health insurance, out-of-pocket spending varies from one-third and two-thirds of total health expenditures. Inequalities in the financial burdens of the health care system are most likely to appear in out-of-pocket expenditures (WHO 2003).

These out-of-pocket expenditures can be highly erratic as demand for health care is unpredictable and any significant share of out-of-pocket expenditure in households' total consumption expenditure can have a disruptive impact on household consumption and ultimately an impoverishing effect on households. Higher public expenditures and better risk pooling mechanisms have been identified as important financing mechanisms to bring down the share of out of pocket expenditures and also the catastrophic impact of these payments (Xu., et al. 2003; Musgrove, 1999; Kawabata, et al. 2002).

A second reason for concern is the lack of data on out-of-pocket expenditure on health and HIV/AIDS. With the exception of data on user fee revenues recorded by providers, most of the out-of-pocket expenditures are not reported in routinely available provider statistics or other administrative data sources. Similarly, general income and expenditure surveys provide inadequate tools to measure these health expenses, especially when detailed information is needed, for example on HIV/AIDS<sup>2</sup>. Also in National Health Accounts or components thereof (e.g. HIV/AIDS, Reproductive Health or Malaria Sub-Accounts) the most problematic component is measuring out-of-pocket expenditures. They require specialised surveys, distracting detailed information either from providers or from households or from both. The difficulties encountered often undermine the credibility of national health accounts estimates and form the most important obstacle to reliable

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1 Resource Tracking and Additionally: Links to National Health Accounts Framework using HIV/AIDS as an example. Geneva, 22-23 March, 2004

international comparison (Rannan-Eliya, 2005). Apart from the usefulness of out-of-pocket expenditure data in health accounts, they may have a value in their own right.

As compared to out-of-pocket expenditures on general health, data and estimates of out-of-pocket expenditure on HIV/AIDS are even less available. To date, except for a few other countries the only available rich data source is the database prepared by SIDALAC for 20 Latin America and the Caribbean countries 1997-2003.

A third reason for concern is the understanding of the factors and mechanisms that affect out-of-pocket expenditures on HIV/AIDS. In general, the level of utilization of HIV/AIDS services and the costing thereof are key factors: the more priced services are used that need to be directly paid by the client, the higher the total level of out-of-pocket payments will be. Underlying factors and mechanisms are likely to play a role. In the recent past, several authors described determinants of OOPE on health care. (Belli, Gotsadze, & Shahriari, 2004; Gaal & McKee, 2005; Kahn, 2005; Standing, 2002) For example, factors that increase expenditures are the duration of hospitalization, rural residence and (un)necessary medical procedures (Kahn, 2005). In their article on the Hungarian perspectives on informal payment for health care, Gaal and McKee (2005: 1447) list causes (and information source) of informal payment in the Hungarian health care system: social-cultural (gratitude, cultural norms), legal-ethical (lack of control and accountability) and economic. Economic reasons are divided in demand and supply side factors. In Georgia demand side factors include patient's expectations and fears, perceptions of quality of services, wanting to skip waiting lists, desire to support doctors, lack of awareness of free service package and lack of the level of trust in the public health system. Supply side factors include government's under funding of health services and inadequate official income of service providers, overcapacity in the service delivery system, poor definition of services offered for free, lack of transparency in the administration and management of provider units (Belli, Gotsadze, & Shahriari, 2004). Other factors related to the facility are the type and quality of services, and the relation between provider and client.

Besides costing levels of health services, access<sup>3</sup> or utilization is regarded a key variable in the determination of out-of-pocket expenditure. In the past it has been tempting to adopt an all-inclusive approach to measure universal access (Shengelia 2003). However, serious difficulties of this approach led to a more simplified approach that focuses on only

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<sup>3</sup> Common terms for universal access often used across international health programs are utilization (demand side), availability (supply side), access and coverage (both sides). The difference between access and coverage is conceptually difficult. The former provides a measure of how much a

three aspects of access: availability, affordability and acceptability (WHO 2005). The three aspects address issues that are of most practical importance for utilization levels: resources for health are scarce which makes health services rare commodities (availability), moreover people will not use health services when they cannot pay for them (affordability) or when their expectations are not met (acceptability). More specific, availability concerns the presence or absence of needed health services (e.g. quality service delivery points within reasonable distance/time). It measures the health care system capacity. Affordability concerns the extent to which intended clients of a service can pay for it, and depends on the one hand on the economic capacity of the client or the household. On the other hand affordability depends on the method of provider payment, the share of other financing in health and risk pooling mechanisms in place. Provider payments methods have different financial risks for the client. While for example a capitation payment method<sup>4</sup> decreases the financial risk of the payer, a fee-for-service payment method increases the financial risk of the payer. A case or episode-based payment scheme tend to moderate the financial risk (PHR 1999). Other financing in health includes the extent of governmental expenditure in public health, health services financed by international and national donors. The premise is that when these sources increase their funding out-of-pocket payments will decrease. Risk pooling mechanisms, including health insurance at both national and local level (social and private insurances and informal community-based insurance schemes) are expected to be naturally related to out-of-pocket expenditure for HIV/AIDS services and goods: the higher insurance coverage, the lower out-of-pocket payments. Overall health insurance coverage levels may however conceal not by the insurance company accepted HIV infected persons or clauses on non-reimbursable costs for HIV related services and goods.

Lief and Blumer (2003) estimated out-of-pocket expenditure on HIV/AIDS in 25 lower-middle and upper-middle income countries for the year 2000 on the basis of HIV/AIDS and related spending data from 14 SIDALAC countries. They made use of three predictors: out-of-pocket expenditure on HIV/AIDS as a percentage of private health spending, the number of private physicians per 1,000 population, and HIV/AIDS prevalence. While repeating the exercise in 2004 for 44 lower-middle and upper-middle income countries the predictor out-of-pocket expenditure on HIV/AIDS as a percentage of private spending was replaced by per capita GDP (Blumer and Lief 2005, see also UNAIDS

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population can reach health services while the latter establishes the share of how a population is eligible for a set or package of health services (WHO 2006).

<sup>4</sup> A capitation method: a payment made directly to health care providers for each individual enrolled with that provider. The payment covers the costs of a defined package of services for a specified period of time. Fee-for-service payment method: separate fees for different services. Case or episode payment method: a fixed payment covering all services for a specified case or illness.

Resource Tracking Consortium 2006). Also McGreevey and Winfrey from the Futures Group attempted to predict out of pocket spending with use of various combinations of independent variables for which SIDALAC data was applicable. None of the regressions reproduced the country-specific SIDALAC data with an adequate degree of accuracy. They concluded that the model specification was insufficiently attuned to the determining factors that affect out of pocket spending for HIV/AIDS goods and services (UNAIDS Resource Tracking Consortium 2006).

The present study will take into account the myriad of factors that influence out-of-pocket expenditure on health and HIV/AIDS. These factors are linked to the behavioral model on the utilization of medical care developed and adapted by Ronald M. Andersen (1986, 1995). The present study adapts and uses this conceptual framework for identifying predictors of aggregate out-of-pocket spending. The main objective of the paper is to examine out-of-pocket expenditure in LAC countries and explore macro-indicators that could predict aggregated out-of-pocket expenditures on HIV/AIDS. To determine the predictors of out-of-pocket expenditure, data from SIDALAC countries and from international databases are used.

The paper consists of 5 sections. The first section is an introduction to the topic and context of the Latin American and Caribbean Region. In Section 2, we define out-of-pocket expenditures on health and elaborate on the methods for measurement of out-of-pocket expenditures. We furthermore introduce the conceptual framework for the paper: the out-of-pocket expenditure model. The data source and estimation methods used for the study are presented in Section 3. Also in this section the macro-indicators or potential predictors from the model are selected. In Section 4, results are discussed with regard to the levels and variations in out-of-pocket expenditure in Latin American and Caribbean countries. In Section 5, the potential predictors are examined for their association with aggregated out-of-pocket expenditure on HIV/AIDS. The last section (6) summarizes and concludes the paper. Before we start with Section 2 we describe the context of the HIV/AIDS epidemic in the Latin American and Caribbean Region.

### ***1.1 HIV/AIDS in Latin American and Caribbean***

The number of people living with HIV/AIDS in Latin America and the Caribbean has risen to an estimated 1.8 million in 2005. Among young people 15–24 years of age, an estimated 0.4% of women and 0.6% of men were living with HIV in 2005 (UNAIDS 2006).

The majority of Latin America and the Caribbean countries are characterized by a 'concentrated' HIV epidemic<sup>5</sup>. At the end of 2001 six out of 20 Latin America and the Caribbean countries qualify for a 'generalized' form of the epidemic, that is, a wider geographical distribution of HIV infection among women and heterosexual couples and prevalence rates above 1 percent. These are the relative smaller countries in the region: Belize, Guatemala, Guyana, Haiti, Honduras and Trinidad and Tobago (Table 1).

HERE TABLE 1

Primarily due to their large populations, Argentina, Brazil, Mexico and Colombia are home to the biggest epidemics in the region. Brazil alone accounts for more than one third of the estimated 1.8 million people living with HIV/AIDS in the region.

The region's epidemics are caused by varying combinations of unsafe sex (both between men, and men and women) and injecting drug use. In nearly all the Latin American and Caribbean countries, the highest levels of HIV infection are among men who have sex with men, followed by female sex workers. HIV prevalence among men who have sex with men ranged between 2% and 28% in different areas, while prevalence among female sex workers ranged between 0% and 6.3%.

Access to antiretroviral therapy in the region has expanded considerably. In Brazil antiretroviral drugs are provided to all in need through the country's national health system. Treatment coverage is high also in Argentina, Chile, Cuba, Mexico, Uruguay and Venezuela, though the terms under which it is provided are not as favourable as those in Brazil. In Costa Rica and Panama, where antiretroviral treatment access has improved notably, AIDS mortality appears to be reducing. But elsewhere, especially in the poorer countries of Central America and the Andean region of South America, progress has been slower. Fewer than 1,000 Ecuadoreans were receiving antiretroviral treatment in 2004, for example, while treatment roll-out efforts in El Salvador, Guatemala, Honduras, Nicaragua

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<sup>5</sup> In countries with "nascent" epidemics, HIV prevalence is very low (less than 5 percent of individuals in groups with high-risk behavior are infected), even among people whose behavior would put them at high risk of contracting it. In countries with "concentrated" epidemics, HIV has risen to high levels among those practicing the riskiest behaviors (over 5% in any sub-population at higher risk of infection - drug injectors, sex workers, and men having sex with men) and is set to spread more widely in the rest of the population. In countries with "generalized" epidemics, HIV prevalence is high even among those whose behavior is unlikely to spread HIV to others (HIV prevalence over one percent in general population). (WHO 2005)

and Paraguay continue to lag (UNAIDS 2006). Garcia-Abreu et al. note that ‘a substantial number of people infected with HIV do not have access to adequate and comprehensive health care’. Reasons given are below quality standards and reduced access due to relative high costs (e.g. anti retroviral treatment) and a poor health infrastructure. The latter is especially true for the network of HIV diagnostic laboratories and the infrastructure needed for diagnosis and follow-up of opportunistic infections. In addition, ‘lack of information, stigmatization, homophobia and social prejudices regarding sexual orientation or behavior prevent access to prevention and clinical care’ (Garcia-Abreu et al. 2003).

## **2 OOPE: concepts, measures and model**

Here we will define the concept of out-of-pocket expenditure and elaborate on the methods that can generate it. The second part describes the model that is used for depicting macro predictors for out-of-pocket expenditure on HIV/AIDS.

### ***2.1 Concepts and measures***

Financial contributions to the health system can be divided into two main categories: public funds and private funds. While public funds are spent by the government, private funds are spent by private agencies, either with a profit or non-profit purpose.

Private financial contributions to the health system comprise private health insurance, employer financed schemes, charity and voluntary contributions (financial or in-kind support), community financing and self help (in cash, kind and labour) and private household expenditure (Mills & Gilson, 1988; Desmet, 2000). Murray (2000) defines household expenditure for health as all direct and indirect financial contributions to the health system attributable to the household through taxes, social security contributions, private insurance and out-of-pocket payments.

Out-of-pocket spending concerns direct expenditure by the household on health services and goods. It includes all categories of health-related expenses paid directly by the household at the time the household receives the health service (Xu et al., 2003). Indirect payments such as payments of health insurance premium or tax are paid in advance whether health care is received or not. The Consumer Expenditure Interview Surveys in the United States use the following definition for out-of-pocket payments: ‘Expenditures paid for

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medical services, product and supplies net of any payment or reimbursement from health insurance plans, government or any other third-party payers' (US Department of Labor, 2003). Hence, an out-of-pocket payment is a direct payment by the individual or household for a health service at the time the service is received. The payment may be in cash or in-kind. For instance, in their qualitative study of Georgia, Belli et al. distinguish self medication, informal payments and all other expenses paid directly (in cash or in-kind) by the households for the health services and goods. (Belli, Gotsadze, & Shahriari, 2004).

In addition, WHO includes in their definition<sup>6</sup> a distinction between non-reimbursable cost sharing, co-payments and deductibles under health insurance schemes, and fee-for-service payments (WHO, 2003; WHO, 2005).

Actual costs may be higher when for example informal out-of-pocket payments are also measured. While there is no generally accepted definition of informal payments, its most common form involves payments to individuals and institutional providers in kind or in cash that are outside official payment channels or for purchases meant to be covered by the health system. These are expenditures outside audits of a country's health system and are often illegal and unreported (Lewis, 2002). Informal payments by households can be made in different forms, ranging from a small gift to a doctor as token of appreciation to all costs related to in-patient care of a hospitalized AIDS patient, including food, accommodation, bed sheets, etc. The extend to which informal out-of-pocket payments for HIV/AIDS care in Latin America and the Caribbean plays a role in total out-of-pocket spending is as of yet unknown.

Most common services and goods that are paid out-of-pocket by HIV/AIDS clients include the purchase of condoms, especially by key risk groups, and payments for patient-specific services such as palliative care, treatment and prophylaxis for opportunistic infections, and anti-retroviral therapy and its related diagnostics (McGreevey et al. 2006). In the absence of insurance coverage, households with acute need for HIV/AIDS services (for example ART) can be forced to expend a relative large share of their household expenditures to this type of care. The amount for treatment can be so high in relation to income that it

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<sup>6</sup> WHO defines out-of-pocket expenditure as the direct outlays of households, including gratuities and payments in-kind, made to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or to the enhancement of the health status of individuals or population groups. This includes household payments to public services, non-profit institutions or nongovernmental organizations and non-reimbursable cost sharing, deductibles, co-payments and fee-for-service.. It excludes payments made by enterprises which deliver medical and paramedical benefits, mandated by law or not, to their employees and payments for overseas treatment. (WHO 2003b, 2005).

results in “financial catastrophe” for the individual or the household. Catastrophic payments have been defined by several authors. They operationalize catastrophic payments by defining them as occurring once out-of-pocket payments pass a threshold of household expenditure (Berki 1986; Wyszewianski 1986; Pradhan and Prescott 2002; Wagstaff and Van Doorslaer 2003; Xu, Evans et al. 2003). We acknowledged that the threshold is somewhat arbitrary. A common choice is 10% of total expenditure (Pradhan and Prescott 2002; Ranson 2002; Wagstaff and Van Doorslaer 2003). The threshold represents an approximate level at which the household is forced to sacrifice of other basic needs, sell productive assets, incur debt, or become impoverished (Russell 2004). Moreover, people may decide not to use services, simply because they cannot afford either the direct costs, such as for consultations, medicines and laboratory tests, or the indirect costs, such as for transport and special food. Poor households are likely to sink even further into poverty because of the adverse effects of illness on their earnings and general welfare

## *2.2 The out-of-pocket expenditure model*

In general, out-of-pocket expenditures are determined by utilization and costing levels of services. One of the most frequently used frameworks for analysing utilisation of services is Andersen’s behavioral model (1968, 1995). We will use this model and adapt it to the needs of the present study to depict variables to predict out-of-pocket expenditure on HIV/AIDS.

The Andersen model represents a multi-disciplinary approach and brings together economic, health care-related, socio-cultural, and psychological factors . The major goal of the initial model was to provide measures of access to medical care, where service utilisation is a function of three components: (1) predisposing factors; (2) enabling factors; and (3) need factors. The predisposing component relates to demographic, socio-structural, and attitudinal-belief variables, irrespective of the underlying condition. The enabling component includes personal and community resources that encourage and allow one to obtain services, such as accessibility of services, income, insurance coverage and knowledge (Yeatts, Crow & Folts 1992) as are family and social support (Crets 1996). Need factors pertain to the assessment of one’s condition – the objective, professional evaluation of need, such as self-reports of diagnosed diseases (used as proxies for physicians’ assessment), and the subjective assessment such as self-rated health status (Wolinsky & Johnson 1991).

Most studies report the dominance of need variables in explaining service utilization (Andersen 1995), particularly for non-discretionary services, over which the individual has little control, such as hospitalisation. On the other hand, discretionary services are more

likely to depend on the decision of the individual. This is the case for most social services, which are likely to be related to a combination of predisposing and enabling factors in addition to need (Kosloski & Montgomery 1994).

The initial behavioural model has been criticised as suffering from methodological and conceptual limitations, promoting the development of additional frameworks (Andersen 1995). Relating to the behavioural model as a 'basic model', Yeatts et al. (1992) proposed a 'practice-oriented' framework that focuses on identifying barriers that impede use of services. These barriers are particularly important in high-risk populations. Barriers may stem from the individual, the provider, or the environment (Minear & Crose 1996, Phillips et al. 1998). Andersen (1995) proposes to adapt the model and include environmental and outcome variables. As part of the environment he distinguishes the health care system and the external environment. The health care system is characterized by health policies, resources and organization. The external environment includes not further specified physical, political and economic components. Outcome variables include perceived health status, evaluated health status and consumer satisfaction.

We have adapted the framework by Andersen (1995). We replaced the output macro indicators on health status and client satisfaction with the variable out-of-pocket expenditure. Figure 1 shows the adapted model.

HERE FIGURE 1

The model will be used for macro indicators that are expected to be associated with out-of-pocket expenditure. The health care system represents health financing and priority setting in health. As such, other financial resources than household expenditures like government and external funding are included. In addition, it includes the capacity and organisation of the health care delivery system and the system of payment for services: provider payment methods have different financial risks for the client and thus influence direct payments for services (PHR 1999).

The external environment concerns policies indirectly related to the health system, for example the government's concern about AIDS, mortality or population growth. Predisposing characteristics include demographic, educational and other macro development indicators. Enabling resources include factors related to income and expenditure, insurance coverage, knowledge and family and social support. The need factor is represented by

epidemiological information. Use of health service is defined as the total number of health service users.

The model shows that out-of-pocket expenditure is basically affected by utilization of health service and the health care system including the service payment system. Furthermore a feedback loop can be observed: similar to insurance coverage or income, direct payments are assumed to influence the need for medical care and health seeking behavior.

### **3 Data sources and method**

Before we operationalise the adapted Anderson model with macro variables from international data sets in the last part of this section, we will first observe the method that was used for collecting out-of-pocket expenditure data on HIV/AIDS in the Latin America Region and examine the SIDALAC database.

#### ***3.1 Estimation of out-of-pocket expenditure on HIV/AIDS in Latin America and the Caribbean***

HIV/AIDS Accounts were conducted by SIDALAC in 20 Latin American and Caribbean countries in the period 1997-2003<sup>7</sup>. SIDALAC derives information on out-of-pocket expenditure using the indirect method<sup>8</sup>. Costing data on (standard) care and treatment were obtained from providers (chart review and interviews with physicians, social workers) or national statistics; and the share of direct payments by households was identified (either from providers or from patient surveys in health facilities, self help groups and NGO's). Furthermore, data on service utilization was collected (from providers and from patient surveys). Total out-of-pocket expenditure were estimated for small samples on the basis of the costing and utilization information derived from providers and clients. Where needed, results were compared (triangulated) and adjusted. Total out-of-pocket expenditures from the small samples were extrapolated to comparable clusters of HIV/AIDS service clients at the national level (Izazola, 2006).

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<sup>7</sup> In addition, SIDALAC started in 2002 with collecting expenditure data on HIV/AIDS in two West African countries (Ghana and Burkina Faso).

<sup>8</sup> In general, approaches to measure household out-of-pocket spending for health are direct measurement from data reported in surveys of household expenditure and the indirect derivation of estimates. The indirect method either uses data reported in surveys of household expenditure and refers these to national income accounts estimates of household consumption, or derives the estimates by triangulating and integrating a mix of data sources. For a detailed description we refer to Rannan-Eliya (2005).

Out-of-pocket expenditure on preventive services mainly focused on the estimation of total condom expenditures, as these were paid by public funds, the private market or subsidized. The estimates triggered a debate whether they could be completely be attributed to HIV/AIDS clients (Izazola, 2006).

The household expenditure data in the SIDALAC database are direct payments net of insurance premiums. There has not been any estimation of how much these expenditures have been claimed as tax-deductibles (Izazola, 2006).

### **3.2 SIDALAC data set**

SIDALAC has been collecting a unique, rich and unprecedented set of data on HIV/AIDS expenditures in 20 Latin American and Caribbean countries in the period 1997-2003. Whereas during the period 1999-2002 in most SIDALAC countries HIV/AIDS Accounts were conducted every year, in 1997, 1998 and 2003 less countries had a HIV/AIDS account<sup>9</sup>. Therefore, it was decided to focus the analysis on 4 years: 1999-2002. In Table 2 the 20 Latin American and Caribbean countries are listed: fourteen countries have a HIV/AIDS account for each of the four years, for the other 6 countries information is available from one to three years. In 3 countries (Argentina, Brazil and Guatemala) out-of-pocket expenditure data was not available in one of the annual HIV/AIDS accounts.

HERE TABLE 2

In general, the reporting of out-of-pocket spending information is not easy and . Therefore, in the expectation that the SIDALAC database is not an exception, out-of-pocket expenditure data per country were more closely observed. One of the conclusions is that not in all countries and not in all years out-of-pocket expenditure data have been collected in the same way. One of the reasons is a change of classification rules in the period under study (Izazola, 2006). The matrices ‘Flow from sources of finance to type of service’ and ‘Flow from financial sources to providers of HIV/AIDS services and goods’ in the SIDALAC database are used to illustrate some of the irregularities.

For some countries only selected health services are paid for out-of-pocket. For example, in Argentine for all reported years provider data are limited to information collected from drugstores. In Venezuela, for all reported years auxiliary services like diagnostic tests and patient monitoring, and blood banks were only paid for by households.

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<sup>9</sup> HIV/AIDS accounts in 1997: 3 countries, 1998: 6 countries and 2003: 8 countries

It may well be that in these countries other financial sources covered the costs of for example in-patient care, anti-retrovirals and condoms. However, the absence of direct payments data in the database for specific service functions could well be due omissions in data collection and reporting. The latter may also apply to the reporting of patient transportation costs. Fifteen countries do not report out-of-pocket payments for transportation for medical reasons. These costs of patient transportation can neither be found among other financing sources, for example, social or private insurances or public social security.

In some countries the reporting of out-of-pocket expenditures substantially changed over the years. For example, in El Salvador we observe a doubling of out-of-pocket expenditure in 4 years time, due to a substantial increase in reporting of hospital and ambulatory care expenses from 2001 onwards. Also in Panama we observe a doubling of total out-of-pocket expenditures from 2001 to 2002. The increase is mainly due to the out-of-pocket payments for condoms in 2002. This doubling of expenses for households can either be ascribed to a real increase because of national campaigning against HIV/AIDS or can be a consequence of improved reporting. The opposite is shown for Uruguay, where a reduction of the out-of-pocket expenditure by more than 50 percent in the period 1999-2002 can likely be ascribed to the absence of reporting costs on non-durable goods, including anti-retrovirals and other medication, from 2001 onwards. In Guatemala out-of-pocket expenditure data for 2002<sup>10</sup> are extremely low compared to 2000 and 2001.

Given the irregularities in the data and the aim of creating a more robust dataset on out-of-pocket expenditures, it was decided to aggregate the data for a period of four subsequent years for each country. Averages for the 4-year period were calculated on the basis of the number of years for which data were available for each country. By applying this method we assume that irregularities have somewhat been smoothed. However the method does not compensate for underreporting of out-of-pocket costs.

Brazil, Haiti and Trinidad and Tobago are countries with only one reporting year in the period 1999-2002. For Haiti and Trinidad and Tobago the 2002 data are consistent with 2003. For Brazil data is available for one year only (2000). Brazil decided to stop collecting data at central level after 2000.<sup>11</sup>

All expenditure figures were downloaded from the SIDALAC database in current US\$. In order to enable comparison on out-of-pocket expenditure figures between countries

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<sup>10</sup> 2001 data for Guatemala were omitted in the analysis.

and to correct for inflation, the purchasing power parity<sup>12</sup> deflator was calculated (GDP PPP in current international US\$/ GDP PPP in constant 1995 International US\$) with data from the World Bank (2004).<sup>13</sup> Accordingly, all US\$ expenditure figures were expressed in PPP constant 1995 US\$ and where needed were calculated per capita or per person living with HIV/AIDS (PLWHA).

### *3.3 Selected variables for prediction*

The out-of-pocket expenditure model in Figure 1 guided the selection of macro indicators that were tested for predicting out-of-pocket expenditure on HIV/AIDS. In Table 3 these variables and their data sources are presented. Data sources include the World Health Report 2005<sup>14</sup> (WHO), World Population Policies 2003 (UN), World Development Indicators 2004 (World Bank), Pan American Health Organization Database (PAHO), and the Report on the Global Aids Epidemic 2004<sup>15</sup> (UNAIDS). Data on the utilization of HIV/AIDS prevention, treatment and care services are not in the SIDALAC database or in any other international database. Neither are data on the costing of HIV/AIDS services and goods.

HERE TABLE 3

Data on the selected macro indicators were aggregated for the period 1999-2002 where possible. The method of data transformation to PPP 1995 constant US\$, as described for the SIDALAC data above, was also applied to applicable macro indicators.

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<sup>11</sup> Brazil shifted to conducting HIV/AIDS accounts at federal level after 2000.

<sup>12</sup> Purchasing power parity (PPP) is an estimate of the exchange rate required to equalise the purchasing power of different currencies, given the prices of goods and services in the countries concerned. PPP exchange rates are used for a number of purposes, most notably to compare the standard of living of two or more countries. It is necessary because comparing the gross domestic products (GDP) using market exchange rates does not accurately measure differences in income and consumption (Wikipedia Encyclopdia, [http://en.wikipedia.org/wiki/Purchasing\\_power\\_parity](http://en.wikipedia.org/wiki/Purchasing_power_parity))

<sup>13</sup> Due to absence on GDP PPP constant 1995 US\$ for Nicaragua in the World Development Indicator Database (World Bank, 2004) , a GDP deflator (current GDP in US\$/constant 1995 GDP in US\$) was calculated and used instead of the PPP deflator.

<sup>14</sup> WHO collected most of the information on private health expenditures from NHA reports, statistical yearbooks and other periodicals, statistical data on official web sites, reports of nongovernmental organizations, household expenditure surveys, academic studies, and relevant reports and data provided by central statistical offices, ministries of health, professional and trade associations and planning councils (WHO, 2005)

<sup>15</sup> The Report on the Global Aids Epidemic 2004 (UNAIDS, 2004a) reports estimated number of people living with HIV. These estimates include all people with HIV infection, whether or not they have developed symptoms of AIDS, alive at the end of 2001.

## 4 Out-of-pocket spending levels on HIV/AIDS in LAC countries

To provide background for the use of macro indicators that predict aggregated HIV/AIDS out-of-pocket expenditure levels in the next section, in this section we will examine the level of out-of-pocket expenditure on HIV/AIDS in LAC countries. From a health systems perspective we will compare these out-of-pocket spending levels with other financial sources of funding, and examine the potential catastrophic nature of out-of-pocket spending at the national level.

### 4.1 *Out-of-pocket expenditure on HIV/AIDS and other financial sources*

In terms of national spending Brazil is the country with the highest total national out-of-pocket expenditure level, followed by Argentina, Peru and Mexico. At the other extreme, Guyana, Belize and Bolivia have lowest national levels. National total expenditure figures are shown in the first column of Table 4.

HERE TABLE 4

National total expenditure figures mask a myriad of factors that influence these national levels as we illustrated before with the adapted Anderson model. One of them is the size of the population, another is HIV/AIDS prevalence (see also Table 1). When taking population size into account the ranking of countries becomes different. This is presented in the second column of Table 4 and in Figure 2 (left panel), where per capita out-of-pocket expenditure on HIV/AIDS for the 20 Latin America and the Caribbean countries are shown. Uruguay, Honduras, Belize and Peru are the countries with high levels of per capita out-of-pocket spending while Venezuela, Bolivia and Guatemala are low per capita spending countries. On average, for all 20 LAC countries 0.56 US\$ (constant 1995) was spent out-of-pocket per person on HIV/AIDS services and goods.

HERE FIGURE 2

When taking HIV/AIDS prevalence into account the picture again is different: countries with highest per capita out-of-pocket expenditure are not necessarily the countries that have highest levels per HIV/AIDS case. Per case levels of out-of-pocket expenditure are shown in the third column of Table 4 and the right panel of Figure 2. Although Uruguay and Peru still show high levels of out-of-pocket expenditure, Honduras and Belize are countries that have an out-of-pocket expenditure per person living with HIV/AIDS around the average, which is 196 US\$ (PPP, constant 1995).

Both panels illustrate that levels of out-of-pocket expenditure on HIV/AIDS vary widely in the LAC region.

Out-of-pocket payments for HIV/AIDS in LAC countries are not the only source of financing of the health system. Other private, public and foreign financial resources contribute as well. Table 5 shows average expense levels per capita for different financial resources: private, public and foreign. In the period 1999-2002, the majority of HIV/AIDS expenditures are financed by public sources: fifty eight percent is contributed directly by the government or via social security systems<sup>16</sup>. Private sources account for nearly one third of all HIV/AIDS expenses, most of them being out-of-pocket expenditures; meaning that households carry on average about one quarter of the total financial burden of HIV/AIDS expenses in Latin America and the Caribbean. Other private sources marginally contribute: on average five percent is added by social and private insurance, non-governmental organizations, and corporations<sup>17</sup>.

HERE TABLE 5

The relative low role of external resources<sup>18</sup> in financing HIV/AIDS expenditures conceals the major role that these foreign funds have in some countries. Figure 3 clearly

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<sup>16</sup> Public financing sources categories in SIDALAC accounts are: Central Government, Sub-National Government and Social Security. In some countries from 2001 onwards SIDALAC used other categories: Ministry of health, Other Central Government, Specific Execution Units, Social Security, Sub-national Government, Other Decentralized and Autonomous.

<sup>17</sup> In some countries SIDALAC used another set of categories from 2001 onwards: private pre-payment or insurance funds, corporations, non-governmental organizations, self-help organizations, and other non-profit organizations.

<sup>18</sup> Foreign financing sources categories in SIDALAC accounts are: Multi-lateral Agencies, Bilateral Agencies, Private External Agencies. In some countries from 2001 onwards SIDALAC used other categories: Multi-lateral Agencies, Bilateral Agencies, International Financial Institutions, Non-profit International Organisations, International Cooperations,, rest of the world households.

shows that countries like Haiti, Bolivia and Guyana heavily depend on foreign money in their combat to fight the relative high levels of HIV/AIDS prevalence. Contributions by the government in these countries are marginal.

Countries where households take a share of more than one third of overall HIV/AIDS expenditures are Peru, Honduras, Paraguay, Uruguay, and Belize. Peru is by far the largest out-of-pocket contributor with a share of nearly 80 percent. At the other end, low shares of out-of-pocket spending – less than 15 percent - can be found in Colombia, Guatemala, Mexico, Guyana, Panama and Venezuela (see Figure 3).

HERE FIGURE 3

#### ***4.2 Out-of-pocket expenditure on HIV/AIDS as a proportion of total household expenditures***

Although out-of-pocket spending on HIV/AIDS is relatively high in some countries, this does not necessarily mean that in these countries out-of-pocket payments are of catastrophic nature for the household. Here we will determine the catastrophic characteristics of HIV/AIDS out-of-pocket expenditures in the LAC countries by comparing them with total household expenditure.

HERE FIGURE 4

Figure 4 shows out-of-pocket expenditure on HIV/AIDS per country as a percentage of final consumption expenditure. Final consumption expenditure data were derived from the World Bank (2004). Percentages considerably differ per country. In most of the countries the out-of-pocket expenditure level on HIV is below the 10 per cent threshold. However, in six countries out-of-pocket expenditure on HIV/AIDS exceeds the threshold<sup>19</sup>. Especially in Honduras, Peru, and Nicaragua the percentage of household consumption that is paid for HIV/AIDS services and goods is high and exceeds even 30 per cent.

## 5 Variables associated with aggregated OOPE levels on HIV/AIDS

In the previous section we observed different rankings for the 20 LAC countries, as they pertain to different methods of expressing out-of-pocket expenditures on HIV/AIDS: national total, per capita, per case and per household consumption expenditure. In the present section, while trying to find suitable predictors for out-of-pocket expenditure on HIV/AIDS, we will use the per capita, per case and national level out-of-pocket expenditure data as the dependent variable.

By applying the adapted Anderson model, the myriad of underlying influencing factors on out-of-pocket expenditures will be operationalized (see sections 2.2. and 3.2). Data from international databases are used, because any predictor derived from these databases has the advantage that it is available and regularly updated for most countries in the world. This approach increases the prospects for estimating aggregated out-of-pocket expenditures in countries that lack information from direct sources, for example, specialized population-based surveys or provider-based estimates. Databases used are produced by the World Bank, WHO, UNAIDS, other UN agencies and for Latin America and the Caribbean specialized agencies like the Pan American Health Organisation (PAHO).

To determine the association between out-of-pocket expenditure levels and the selected variables from the adapted Anderson model, bi-variate correlation coefficients were calculated. Table 6 shows the coefficients for the independent variables of the model and for five dependent variables: two per capita out-of-pocket expenditure variables - one on general health and one on HIV/AIDS -, one per case out-of-pocket expenditure variable on HIV/AIDS and two variables on the national total for out-of-pocket expenditures on HIV/AIDS.

The first column represents correlation coefficients for per capita out-of-pocket expenditure on general health. As expected, health care system indicators, predisposing indicators and enabling indicators are associated with per capita out-of-pocket expenditure on health. Especially per capita GDP and expenditures pertaining to household consumption and total health are correlated. But also health capacity indicators and general development

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<sup>19</sup> This assumes equal household consumption expenditure in each country.

indicators as life expectancy at birth, the percentage urban population and literacy rate are significantly correlated with per capita out-of-pocket expenditure on health.

HERE TABLE 6

With regard to other financial sources at the national level, we observe a significant negative correlation with payments by foreign donors. In other words, more health funds from abroad reduce household health spending. This relationship is much weaker and not significant for government expenditures.

Risk sharing mechanisms are expected to have a negative bearing on the level of out-of-pocket expenditure. For the LAC countries the two selected indicators do not support the existence of this relationship with out-of-pocket expenditure on health. A possible explanation is the lack of data for some of the countries in the data used from the World Health Report 2005.

While out-of-pocket expenditure on general health is positively associated with most macro indicators, per capita out-of-pocket expenditure on HIV/AIDS are not related to any of the macro-indicators. This is shown in the second column of Table 6. The relationships are weak and not significant. Most probable reason for this is that national per capita out-of-pocket expenditure on HIV/AIDS mask sub-national variations in the prevalence of HIV/AIDS and household expenditure on HIV/AIDS services and goods. For example, the south-eastern part of Brazil is characterized by a 'general' epidemic, whereas in the rest of the country scattered area's with higher HIV/AIDS prevalence prevail consisting of men having sex with men, injecting drug users and commercial sex workers. National per capita expenditure data on HIV/AIDS services therefore conceal the higher HIV/AIDS prevalence and per capita expenditure levels in the south-eastern part of Brazil. An example of a country for which this is probably not apparent is Haiti. The HIV epidemic is spread all over the country and the national per capita out-of-pocket expenditure level is likely a representative figure for Haiti.

Measuring expenses per person living with HIV/AIDS may better reflect national out-of-pocket expenditure levels, because the denominator represents the actual population that uses the HIV/AIDS services and goods. The variable is shown in the third column of Table 6. Bi-variate correlations with out-of-pocket expenditure on HIV/AIDS per person living

with HIV/AIDS were found for three indicators: per capita total health expenditure, percentage urban population and physicians per 10,000 population.

Other variables do not show this association. For example, we hypothesized that a higher concern about AIDS by the Government will lead to lower levels of out of pocket spending on HIV/AIDS, due to more financial support through the health care system. The results do not support this. The correlation of out-of-pocket expenditure per capita and per PLWHA with the need indicator – number of HIV/AIDS cases – was not calculated, because the denominator of the dependent variable is part of the independent variable.

Besides per capita and per case levels of out-of-pocket expenditure we also examined the total national level of out-of-pocket expenditure. The variable is shown in the fourth column of Table 6. Expectedly, the number of HIV/AIDS cases is strongly and positively associated with national level data on out-of-pocket expenditure. Other variables show insignificant relationships with the dependent variable. Figure 5 also shows this strong relationship between the number of HIV/AIDS cases per country and total out-of-pocket expenditure on HIV/AIDS .

HERE FIGURE 5

Two remarks about the use of the number of HIV/AIDS cases in the estimation of aggregated out-of-pocket expenditure levels should be made. First, surveillance systems or other methods that screen for persons living with HIV/AIDS likely underreport the number of HIV/AIDS cases, due to stigmatization and non disclosure of people's HIV/AIDS status. Underreporting of HIV/AIDS cases reduces the overall national level of out-of-pocket expenditure, when the number of HIV/AIDS cases is used together with costing of HIV/AIDS services and goods to estimate total out-of-pocket spending. Underreporting of HIV/AIDS cases increases out-of-pocket expenditure per person living with HIV/AIDS when the number of HIV/AIDS cases is used as denominator for out-of-pocket costs and derived from, for example, pharmaceutical records. Second, information on the geographic distribution and socio-economic composition of the group of persons living with HIV/AIDS is important for out-of-pocket expenditure estimates, but not reflected in national figures on HIV/AIDS cases. For example, in countries with 'concentrated' epidemics, with high risk groups in poor and remote area's (e.g. at country borders) the use of costing methods that

apply average national pricing levels for HIV/AIDS services and goods may well overestimate out-of-pocket expenditure for these distinct areas.

Given the large variation between national out-of-pocket spending levels per country (see Table 1) we also transformed the variable onto a logarithmic scale. Results are shown in the last column of Table 6. Again the association with the number of HIV/AIDS cases is positive and significant, but less strong. Moreover, two other variables show significant associations: the percentage urban population and per capita total health expenditure. Both variables already appeared to be related to out-of-pocket expenditure while we discussed per case associations.

#### Multiple-variable regression analysis

Multiple-variable regression analysis was applied to potential predictors of out-of-pocket expenditure. The independent variables that showed a significant correlation with out-of-pocket expenditure were included in the analysis: the number of HIV/AIDS cases, per capita total health expenditures, the percentage urban population, and the number of physicians per 10,000 population. Three dependent variables were used: national level out-of-pocket expenditure on HIV/AIDS, logarithm of national level out-of-pocket expenditure on HIV/AIDS and out-of-pocket expenditure on HIV/AIDS per PLWHA. Results for these three dependent variables are shown in Table 7.

HERE TABLE 7

Of all models Model A explains most of the variation in the dependent variable. Nearly three quarter of the variation in national level out-of-pocket expenditure on HIV/AIDS in the 20 LAC countries for the period 1999-2002 is explained by the prevalence of HIV/AIDS. Taking this dependent variable on a logarithmic scale, we observe that the number of HIV/AIDS cases still is the dominant predictor. The two and three variable models that include HIV/AIDS prevalence (Models B1, B2, and B3) explain about 50-60 % of the variation. Observing HIV/AIDS prevalence and the percentage urban population in the bi-variate models (Models B5 and B7 respectively), they each explain about one third of the variation in the dependent variable.

Taking out-of-pocket expenditure on HIV/AIDS per PLWHA as dependent variable, the number of physicians per 10,000 population appears to have most predictive power. In

any of the models that include this variable nearly 60% of the variation is explained (Models C1, C2, C3 and C5). Actually, the bi-variate model (Model C5) has the highest F-score of all and has preference over the other models. Observing the other bi-variate models, per capita total health expenditure explains about one third of the variation in the dependent variable. None of the two-variable models that include per capita total health expenditure and percentage urban population (Models B4 and C4) have high predictive power.

## **6 Summary and conclusions**

The paper analyses aggregated out-of-pocket expenditure on HIV/AIDS in LAC countries and explores macro indicators that could predict out-of-pocket expenditure on HIV/AIDS in countries that lack out-of-pocket expenditure statistics on HIV/AIDS.

In six countries out-of-pocket expenditure on HIV/AIDS exceeds the threshold of 10 percent of final household consumption. Especially in Honduras, Peru, and Nicaragua the percentage of household consumption that is spent on HIV/AIDS services and goods is high and exceeds even 30 per cent. Governments in these countries may want to direct their policies towards compensating the catastrophic loss in household expenditure due to HIV/AIDS.

In general, with an average share of a quarter in total HIV/AIDS expenditure, per capita out-of-pocket spending on HIV/AIDS varies widely between countries in the Latin America and the Caribbean region. Yet out-of-pocket expenditure variables on HIV/AIDS can be expressed in several aggregated ways: national total, per capita, per case or as a percentage of another expenditure variable, for example out-of-pocket expenditure as a percentage of household consumption. The study showed that each of the expressions of out-of-pocket expenditure on HIV/AIDS resulted in different rankings among the 20 LAC countries. For example, countries with highest per capita out-of-pocket expenditure are not necessarily the countries that have highest out-of-pocket expenditure levels per person living with HIV/AIDS: although Uruguay scores highest on both, Honduras and Belize have next highest levels of per capita, but rank medium to low when measured per HIV/AIDS case. The differential rankings demand a closer observation of the aggregated variable out-of-pocket expenditure while exploring predicting variables. Therefore, national total, per capita and per HIV/AIDS case out-of-pocket expenditure variables were calculated for testing the macro indicators.

These macro indicators were selected with use of an Out-of-Pocket Expenditure Model that was adapted from Andersen (1968, 1995). The model was used, because it

provides simple but clear determinants of out-of-pocket expenditure, namely HIV/AIDS service utilization and health care system indicators, including service and goods costing data. Nonetheless, the mainly linear character of the model may not reflect reality completely. It assumes unidirectional influence of one group of variables on the other. For example, predisposing variables like education directly affects enabling factors, like income, but do not directly affect behavioral factors, like health service utilization. In reality this is probable.

The selection of macro-indicators in the model was guided by the availability of data from international databases. This limited the number of variables that could be examined as predictors of out-of-pocket expenditure. For example, data on average costing of services and goods from providers or health utilization data were not available in the SIDALAC database and could not be included. However, other environmental, predisposing and enabling variables that were assumed to affect out-of-pocket expenditure could be incorporated.

As a control, the relationships of these macro variables with out-of-pocket expenditure on general health were examined. It appears that most of the indicators show a significant association with per capita out-of-pocket expenditure on health. Contrary to expectation, the social and health risk sharing or insurance variables do not show any relationship. Another finding that contrasts expectation is the weak relationship between public spending on health and out-of-pocket expenditure on health. The selected variables may not be valid or other reasons like the level of insurance coverage or public health spending mask the association. This was not further investigated.

As mentioned, several types of the dependent variable - national total, per capita and per HIV/AIDS case out-of-pocket expenditure variables - were calculated for testing the macro variables from the Out-of-Pocket Expenditure Model. Study results show that the predicting variables differ for each of the dependent out-of-pocket expenditure variables on HIV/AIDS.

Not surprisingly, the model's need or epidemiologic indicator – the number of HIV/AIDS cases - is strongly and positively associated with total national out-of-pocket expenditure on HIV/AIDS in the 20 LAC countries for the period 1999-2002. Nearly three quarter of the variance is explained by this predictor alone. Another convincing predictor is one of the capacity indicators of the health care system – the number of physicians per 10,000 population - , which alone explains nearly 60 percent of the variance in the per case out-of-pocket expenditure on HIV/AIDS for the LAC countries. Each of these predictors

may be used in combination with the per capita total health expenditure or the percentage urban population, although the explanatory power of these multiple variable models is the same or even less.

Although good predictors of out-of-pocket expenditure on general health, the data show that other health care system, predisposing and enabling variables from the Out-of-Pocket Expenditure Model, are poor in predicting out-of-pocket expenditure on HIV/AIDS. For example, per capita GDP and per capita household final consumption expenditure are weakly associated with out-of-pocket expenditure on HIV/AIDS. This could mean for the Latin American and Caribbean Region that the level of out-of-pocket expenditure on HIV/AIDS is independent of the wealth status of a country.

The study has aimed at a robust analysis by using aggregated data over a 4-years time period, while maximizing the number of countries. The study has a number of limitations. First, some irregularities in the SIDALAC database may have influenced the outcome of the study. Second, the two most direct predictors of out-of-pocket expenditure on HIV/AIDS, utilization of HIV/AIDS services and goods and the costing thereof, were not included as variables in the model. Third, the identified predictors are region specific, other regions may have other environmental, population and behavioral characteristics that require different predictors.

Finally, we generally conclude that out-of-pocket expenditure on HIV/AIDS is difficult to capture due to its complex causal mechanism and its multiple components. Here we have made an attempt to conceptualize and test determinants of out-of-pocket expenditure on HIV/AIDS, but this a first exercise that hopefully will be followed by more case studies and supported by in-depth qualitative analysis, thus contributing to insight into the complex area of out-of-pocket expenditure measurement on health in general and HIV/AIDS in particular.

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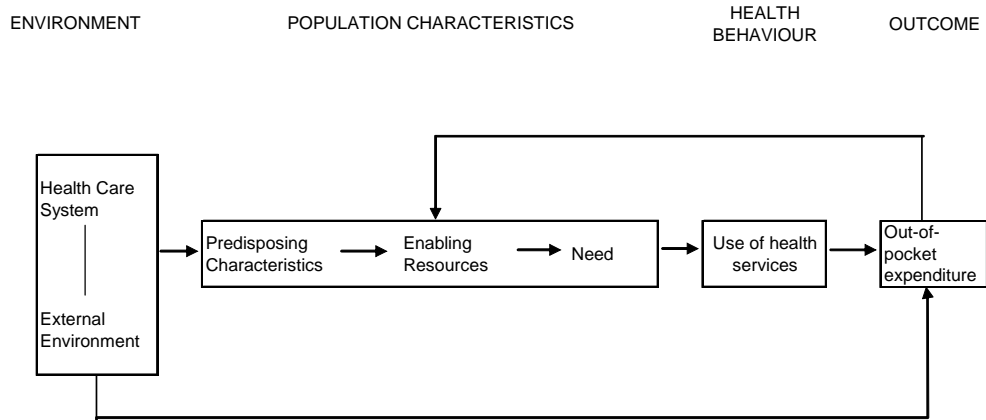
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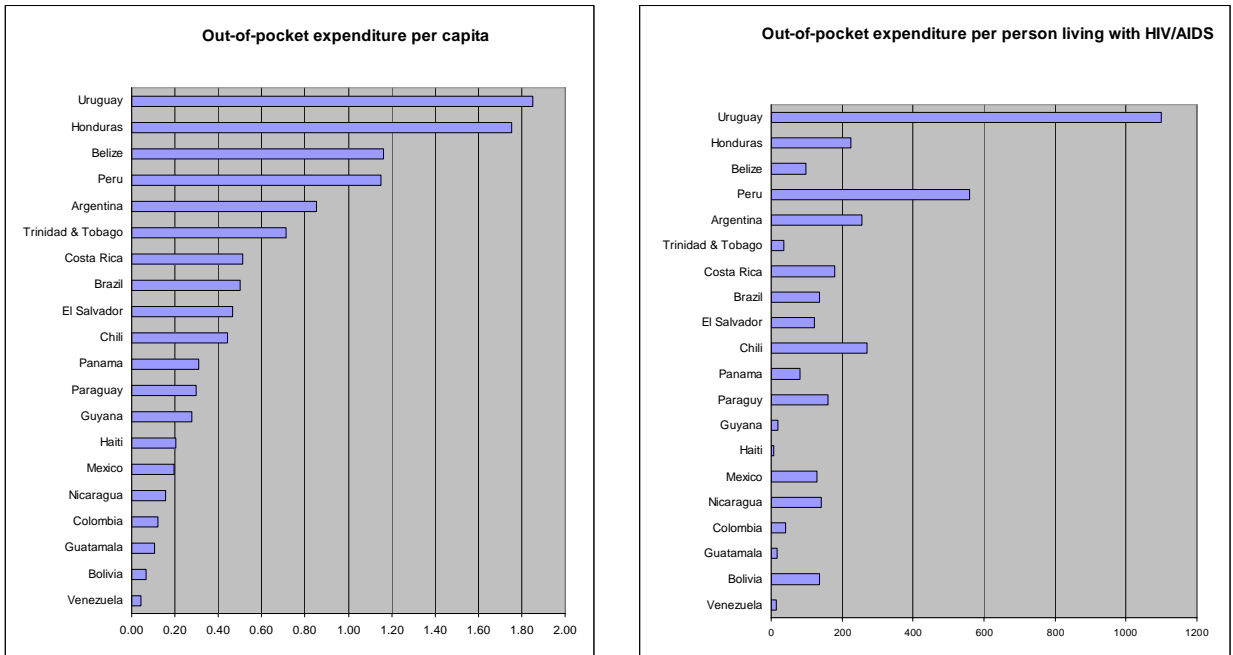
**FIGURES**

Figure 1: Out-of-pocket expenditure model



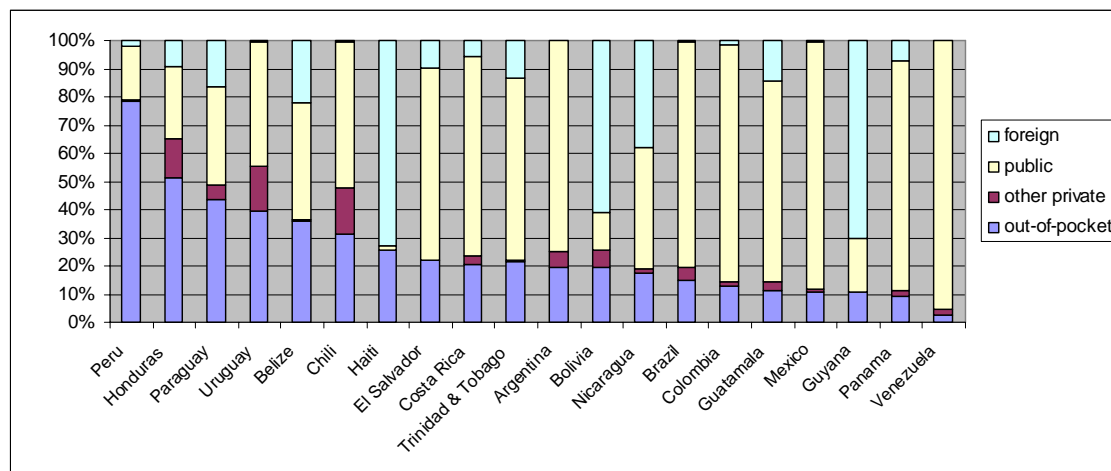
Adapted from: R.M. Andersen, 1995. "Revisiting the Behavioural Model and Access to Medical Care: Does it matter?" Journal of Health and social Behaviour 36 (March): 1-10.

Figure 2: Out-of-pocket expenditure on HIV/AIDS per capita and per person living with HIV/AIDS in 20 LAC Countries, 1999-2002 (constant 1995 PPP US\$)



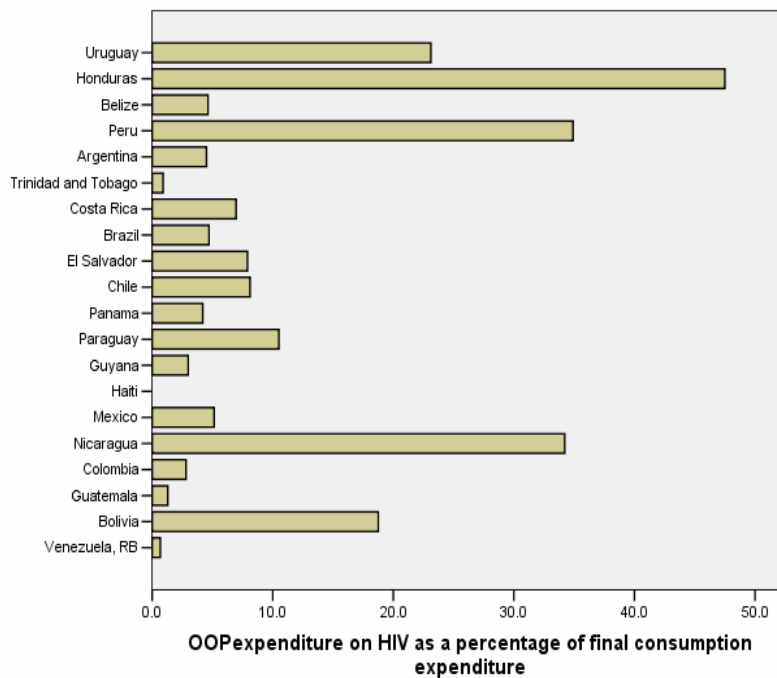
Source: Number of HIV/AIDS cases (UNAIDS, 2004a); OPE HIV/AIDS (SIDALAC 1997-2003 database)

Figure 3: Percentage distribution of per capita expenditures on HIV/AIDS in 20 LAC Countries, 1999-2002



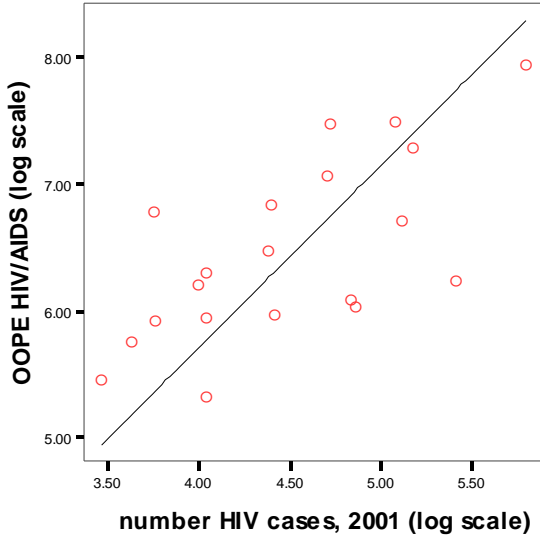
Source: SIDALAC 1997-2003 database

Figure 4: Out-of-pocket expenditure on HIV/AIDS as percentage of final consumption expenditure in 20 LAC countries, 1999-2002



Note: Haiti no data available on final consumption expenditure.  
Source: SIDALAC 1997-2003 database

Figure 5: Relation between Number of HIV/AIDS cases and total out-of-pocket expenditure on HIV/AIDS (PPP US\$ const 1995) in 20 LAC Countries, 1999-2002.



Source: Number of HIV/AIDS cases (UNAIDS, 2004a); OOPE HIV/AIDS (SIDALAC 1997-2003 database)

TABLES

Table 1: Number of PLWHA and HIV/AIDS prevalence for 20 LAC countries, end 2001.

	Total population	Number of HIV/AIDS cases, end 2001	HIV/AIDS prevalence, end 2001	HIV/AIDS prevalence adults (15-49 year), end 2001
Argentina	35,848,667	120,000	0.3	0.7
Belize	243,000	2,900	1.2	2.1
Bolivia	8,526,000	4,200	0.0	0.1
Brazil	170,100,000	630,000	0.4	0.6
Chile	15,305,000	25,000	0.2	0.3
Colombia	42,650,500	130,000	0.3	0.5
Costa Rica	3,838,750	11,000	0.3	0.6
El Salvador	6,262,750	24,000	0.4	0.6
Guatemala	11,992,000	69,000	0.6	1.1
Guyana	760,750	11,000	1.4	2.5
Haiti	8,286,000	260,000	3.1	5.5
Honduras	6,541,500	51,000	0.8	1.6
Mexico	98,686,500	150,000	0.2	0.3
Nicaragua	5,206,000	5,800	0.1	0.2
Panama	2,875,500	11,000	0.4	0.7
Paraguay	5,330,250	10,000	0.2	0.4
Peru	25,751,000	53,000	0.2	0.4
Trinidad and Tobago	1,304,000	26,000	2.0	3.0
Uruguay	3,332,000	5,600	0.2	0.3
Venezuela, RB	24,399,750	73,000	0.3	0.6

Source: (UNAIDS, 2004a)

Table 2: Latin American and Caribbean countries for which HIV/AIDS account data including out-of-pocket expenditure data were collected during 1999-2002

	1999	2000	2001	2002
Argentina	●	●	●	-
Belize	●	●	●	●
Bolivia	●	●	●	●
Brazil	-	●		
Chili	●	●	●	●
Colombia	●	●	●	●
Costa Rica	●	●	●	●
El Salvador	●	●	●	●
Guatemala	●	●	-	●
Guyana	●	●	●	●
Haiti				●
Honduras		●	●	
Mexico	●	●	●	●
Nicaragua		●	●	●
Panama	●	●	●	●
Paraguay	●	●	●	●
Peru	●	●		
Trinidad & Tobago				●
Uruguay	●	●	●	●
Venezuela	●	●	●	

Notes: ● HIV/AIDS account with out-of-pocket expenditure data

- HIV/AIDS account without out-of-pocket expenditure data

Source: SIDALAC Database for National HIV/AIDS Accounts for Latin America and the Caribbean and West Africa., 1997-2003

Table 3: Selected potential predicting variables for aggregated out-of-pocket expenditure on HIV/AIDS

Variable	Data source
<b>ENVIRONMENT</b>	
<b>Health Care System</b>	
<i>Other financial resources:</i>	
General government expenditure on health as percentage of total health expenditure	World Health Report 2005. WHO
External resources for health as percentage of total health expenditure	World Health Report 2005. WHO
<i>Health care system capacity:</i>	
Physicians per 10,000 population	Pan American Health Association (website)
Hospital beds per 1,000 population	Pan American Health Association (website)
<b>External environment</b>	
Government concern about AIDS (dummy)	World Population Policies 2003, UN
<b>POPULATION CHARACTERISTICS</b>	
<b>Predisposing characteristics</b>	
Adult literacy rate	World Development Indicators 2004, WB
Life expectancy at birth	World Development Indicators 2004, WB
Percentage urban population	World Development Indicators 2004, WB
<b>Enabling resources</b>	
<i>Income:</i>	
Gross Domestic Product, per capita	World Development Indicators 2004, WB
<i>Expenditure:</i>	
Household final consumption expenditure, per capita	World Development Indicators 2004, WB
Total health expenditure, per capita	
Out-of-pocket expenditure on health, per capita	World Health Report 2005. WHO
<i>Risk sharing:</i>	
Social security expenditure on health as percentage of total health expenditure	World Health Report 2005. WHO
Private pre-paid plans as percentage of total health expenditure	World Health Report 2005. WHO
<b>Need</b>	
HIV/AIDS prevalence	Report on the Global Aids Epidemic 2004, UNAIDS
<b>HEALTH BEHAVIOUR</b>	
<b>Utilization of HIV/AIDS service</b>	No data available

Table 4: Average annual out-of-pocket expenditures on HIV/AIDS for 20 LAC countries, 1999-2002

Country	Out-of-pocket expenditure HIV/AIDS (constant US\$ 1995)	Out-of-pocket expenditure HIV/AIDS per capita (constant US\$ 1995)	Out-of-pocket expenditure HIV/AIDS per PLWHA (constant US\$ 1995)
Brazil	85,174,573	0.50	135
Argentina	30,586,823	0.85	255
Peru	29,609,903	1.15	559
Mexico	19,357,464	0.20	129
Honduras	11,454,204	1.75	225
Chili	6,749,630	0.44	270
Uruguay	6,156,921	1.85	1099
Colombia	5,166,424	0.12	40
El Salvador	2,925,581	0.47	122
Costa Rica	1,967,883	0.51	179
Haiti	1,688,697	0.20	6
Paraguay	1,592,727	0.30	159
Guatamala	1,200,363	0.00	17
Venezuela	1,085,229	0.04	15
Trinidad & Tobago	927,078	0.71	36
Panama	890,309	0.31	81
Nicaragua	823,632	0.16	142
Bolivia	572,192	0.07	136
Belize	282,323	1.16	97
Guyana	210,470	0.28	19

Source: SIDALAC Database 1997-2003

Table 5: Average per capita expenses on HIV/AIDS in 20 LAC Countries, 1999-2002

	US\$ (PPP, 1995 constant)	%
Private		
Out-of-pocket	0.56	25.5
Other private	0.11	5.0
Public	1.26	57.3
Foreign	0.27	12.2
Total	2.19	100.0

Source: SIDALAC Database 1997-2003

Table 6: Pearson's Correlation Coefficient for out-of-pocket expenditures on health and HIV/AIDS with selected indicators, 1999-2002 LAC region<sup>1</sup>

	Out-of-pocket expenditure on health (per capita)	Out-of-pocket expenditure on HIV/AIDS (per capita)	Out-of-pocket expenditure on HIV/AIDS (per PLWHA)	Out-of-pocket expenditure on HIV/AIDS (national total)	Logarithm of out-of-pocket expenditure on HIV/AIDS (national total)
<b>ENVIRONMENT</b>					
<i>Health care system indicators</i>					
<i>Capacity</i>					
Physicians per 10,000 population	0.60**	0.45	0.75**	0.21	0.39
Hospital beds per 1,000 population	0.65**	0.43	0.12	0.37	0.36
<i>Other financial resources</i>					
General government expenditure on health as percentage of THE	-0.36	-0.33	-0.35	-0.19	-0.27
External resources for health as percentage of THE	-0.49*	-0.02	-0.24	-0.23	-0.26
<i>External environment indicators</i>					
Government concern about AIDS(dummy)	0.29	0.31	0.07	0.20	0.36
<b>POPULATION CHARACTERISTICS</b>					
<i>Predisposing indicators</i>					
Life expectancy at birth	0.60**	0.24	0.29	0.01	0.17
Percentage urban population	0.71**	0.24	0.48*	0.40	0.60**
Adult literacy rate	0.63**	0.23	0.29	0.09	0.10
<i>Enabling indicators</i>					
<i>Income</i>					
GDP, per capita	0.93**	0.33	0.40	0.35	0.44
<i>Expenditure</i>					
Household final consumption expenditure, per capita	0.93**	0.34	0.44	0.28	0.42
Total health expenditure, per capita	0.87**	0.41	0.60**	0.34	0.48*
Out-of-pocket expenditure on health, per capita	-	0.25	0.28	0.44	0.50
<i>Risk-sharing</i>					
Social security expenditure on health as percentage of THE <sup>a</sup>	0.04	-0.24	-0.25	-0.20	-0.06
Private pre-paid plans as percentage of THE <sup>b</sup>	0.08	-0.07	-0.30	-0.38	0.41
<i>Need indicator</i>					
Number of HIV/AIDS cases (2001)	-	-	-	0.86**	0.58**

\*\* significant at 0.01 level (2-tailed) \* significant at 0.05 level (2-tailed)

<sup>1</sup> GDP, Household final consumption expenditure, total health expenditure, and out-of-pocket expenditure are in PPP constant 1995 US\$;

<sup>a</sup> 15 countries ; <sup>b</sup> 19 countries

Data sources: World health Report (WHO, 2005), World Development Indicators (World Bank), Pan American Health Organisation (website)/ see also Table 2.

Table 7: Multiple-variable regression of predictors on dependent variable

**Dependent variable: National level Out-of-pocket expenditure**

	Model A	
	Beta	t-value
Number of HIV/AIDS cases (2001)	0.852	6.919
$R^2$	0.727	
F	47.868	
Sign.	0.000	

**Dependent variable: Logarithm of National level Out-of-pocket expenditure**

	Model B1		Model B2		Model B3		Model B4		Model B5		Model B6		Model B7	
	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value
Number of HIV/AIDS cases (2001)	0.491	3.033	0.530	3.082	0.491	3.105			0.581	3.027				
Total health expenditure, per capita	0.101	0.436	0.413	2.404			0.096	0.340			0.479	2.312		
Percentage urban population	0.436	1.861			0.509	3.222	0.526	1.862					0.596	3.149
$R^2$	0.593		0.505		0.589		0.360		0.337		0.229		0.355	
F	7.785		8.686		12.162		4.773		9.163		5.348		9.919	
Sign.	0.002		0.003		0.001		0.023		0.007		0.033		0.006	

**Dependent variable: Out-of-pocket expenditure on HIV/AIDS per PLWHA**

	Model C1		Model C2		Model C3		Model C4		Model C5		Model C6		Model C7	
	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value
Number of physicians per 10,000 population	0.662	1.620	0.576	1.545	0.850	3.465			0.754	4.597				
Total health expenditure, per capita	0.225	0.585	0.199	0.535			0.106	0.375			0.595	3.141		
Percentage urban population	-0.148	-0.586			-0.132	-0.536	0.518	1.832					0.483	2.338
$R^2$	0.587		0.577		0.577		0.284		0.569		0.354		0.233	
F	6.640		10.237		10.238		4.769		21.131		9.868		5.467	
Sign.	0.005		0.002		0.002		0.023		0.000		0.006		0.031	