

EXPLORING THE RELATIONSHIP BETWEEN PRIVATISATION OF HEALTH CARE AND INFANT MORTALITY IN AFRICA

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Abstract

The introduction of user fee system in the government health facilities of most Sub-Saharan African countries (SSA), shifted part of the burden of financing health care onto the community, raising concerns about its relation to the health outcome of the infants and children. To explore whether user fees have no relation to the reduction in under five mortality rate in SSA. We took user fees as a proxy measure for Privatization in the health sector and under five mortality rate (U5MR) as a proxy measure for the infant and child mortality rate. The exploratory study involved thirty-seven SSA countries who had implemented some form of user fees systems by 1995. We analyzed by regression cross-sectional data of the study variables, in addition to studying literature on the subject. Out-of-pocket payment has a relation to the reduction of U5MR in SSA. The null hypothesis rejected at conventional level of 0.05, ($p= 0.233$) and CI (-1.136 to 0.288). A review of the literature further emphasizes this reduction, elaborating on how; user fees do influence the health seeking behaviors of the families of these children. We can to an extent attribute the reduction in the health outcome of the infants and children of Sub-Saharan Africa to out-of-pocket payment, bearing in mind that user fees as a health policy can be seen in this instance as a "input", to a means to an end. As a health policy, user fee should be implemented with specific regulations, and supplemented with other forms of health care financing, to boost government revenue and development of the health care delivery systems.

Introduction

Most African countries have had a long tradition of providing free public health services. Health policy experts and decision makers in these countries have in the past decade been challenged by increasingly stringent budgets, growing populations and expanding demands for health services. Consequently government resources have been taxed just to maintain existing public health systems and services. In 1987, the World Bank recommended privatization in the health sector as part of an agenda for financing public health services in developing countries (World Bank 1987)¹. Since then countries in Sub-Saharan Africa (SSA) have been encouraged to adopt this policy.¹⁻⁵ In order to generate additional revenue, which usually expands geographical or financial

access to services or improves the quality of care, or both. The issues inherent to privatization are many, varied and complex. Rhetoric surrounding these issues refers to personal payments. That allows the substitution of private for public sources of funding such as co-payments, user fees and private insurance.

Privatization in the health sector context refers to the transfer of responsibility for funding health services from public to private sector. Due to the problems inherent to the definition of privatization per se, this analysis has restricted privatization in the health sector to private, out-of-pocket payment, where we take user fees as a proxy measure for privatization. In most SSA countries, private insurance is almost

negligible as most people cannot afford the premium. Meanwhile, only little has been done about the implementation of co-payments as a form of private contribution towards healthcare financing in these areas.^{4,6} User fees (Out-of-Pocket payment) prescribes the timing of the contribution relative to the time of needing and receiving health care".⁶ To distinguish it from other forms of private contributions, user fees by definition, severely limit the opportunities to incorporate insurance and /or solidarity mechanisms that reduce the impact of uncertainty on the consumption of health care.⁶ In this respect user fees differ from co-payments since the latter invariably is not paid at the point of use of health care delivery. Consequently, the issue of user fees for health care has sparked debate and many wonder whether the policy has had any effect on health outcomes of the infants and children in Sub-Saharan Africa.⁷

For over two decades, Sub-Saharan Africa has had a high infant and child mortality rate of 178/1000 compared to other developing countries such as South East Asia with a mortality of 57/1000 and Latin America and Caribbean (72/1000).⁸ The implementation of user fees as a source of finance in health facilities operated by government in SSA as shown by a World Bank Survey (Shaw and Griffin, 1995), covering thirty-seven African countries, found that national system of user fees are operating in seventeen countries, whereas they play a relatively small role, or are not enforced effectively in another eleven countries. In the remaining nine countries, user fees are not part of a national system but are collected on a facility or community basis in six countries, and are not in place in three countries (table 1).^{3, 4, 5} In countries where this policy has been adopted, many wonder whether the policy has had any effect on the health outcome of the infants and children of SSA. For example, Sierra Leone's user fees plays a relatively small role or is not enforced effectively in the national systems,^{3, 4, 5} besides it has the highest under five mortality rate at 267 as compared to Sao Tome and Principe that has no user fees and its under five mortality is 62.

In addition to this, empirical studies on financing better health care in SSA currently show that User fees are already the major form of health financing in SSA countries. The private, out-of-pocket expenditures on health represent about 43 percent of all expenditures on health in SSA, compared with 37 percent from government, and about 20 percent from donors (World Bank 1994a).^{3, 4} Private insurance (voluntary or employment related) is almost negligible, and consequently many rely on the out-of-pocket payments (without insurance) and face the risk

of catastrophic costs⁹, or none use/under use. In thirty-five of these countries with user fees in place, more than 10 percent of children (under five) die each year in each of these SSA countries. This has been thought to be related to the effect of closing off access to those who cannot pay. As a recent paper concluded, user fees "increase the barriers disproportionately faced by the poor when seeking health care."¹⁰

Henceforth privatization in the health sector is a controversial issue that invokes passion among people with differing ideologies. In this paper, we explore whether user fees as an out-of pocket payment at the time of use of health care, has no relation to the reduction of under-five mortality (U5MR) in SSA countries. And also we look at the influence of user-fees on health seeking behavior of the families of children, in some of these countries that have adopted this policy.

Method

This paper is based on an explorative study with the aim to generate and test an etiologic hypothesis using country-level data, included thirty-seven (37) countries (table 1), located south of the Sahara Desert as of 1997 (excluding the French dependencies of Reunion and Mayotte). These countries had implemented user fees for publicly financed services in the health sector by 1995. This design was chosen because of its ability to combine existing data files on large populations. Furthermore it is less expensive and takes less time than studies involving the individual as the unit of analysis.

The data we derived mainly from the World Development indicators database. Including, World Health Organization (WHO), United Nations Educational, Scientific, and Cultural Organization (UNESCO), United Nations Children's Fund (UNCF) and Global water supply and sanitation assessment 2000 report. Data statistics for mortality rate under five (per 1,000 live births) were obtained from the World Development indicators database while as the out-of-pocket expenditure on health as % of total expenditure on health is from the WHO report, 2000. We do not discuss the primary data sources or estimation methods here; since they have been describe elsewhere.¹¹

The literature search was from PubMed, published on-line World Bank discussion and staff working papers and scientific journals including; social science and medicine, international journal of Health Planning and Management, Health Policy and Planning.

Definitions

We defined user fees as out-of-pocket payment (without insurance) by the users, at the time of use of health care. In this sense, we go beyond concretizing the idea that it is desirable for consumers, regardless of their income, to make contributions to financing of public health care in addition to those they make through taxes.

The infant mortality rate was defined as the probability of dying between birth and exactly one year of age while as child mortality was defined as the probability of dying between one and five years. And as a proxy measure for the infant and child mortality rate, we use the under five mortality rate (U5MR) because it gives a broader picture of the health of children under five (both infants and children) and is less affected by cultural factors such as the time of weaning which may differ among countries and consequently affect the infant mortality picture.¹²

Selection of variables

The selected factors relevant to the young population's health status included; education of the mother, safe drinking water, health services and the economic situation of a country. As a proxy measure for education of the mother we took the adult female illiteracy rate because of its importance as shown by Strauss (1987), that parent's education, is an important determinant of children's health,¹³ And although evidence from aggregated data is more scarce, Cochrane, O'Hara, and Leslie (1980) also report strong correlations between adult (female) literacy and measures of children's health.¹⁴ We expect safe drinking water to be important especially where children are concerned (to avoid diarrhoeal diseases) and so we assessed this by examining the % population with access to an improved water source.

As proxy measures for health services rendered to children, we use-immunization against TB for one year olds, birth attended by skilled health staff and the population per physician. Health services and its selected proxy measures are plausible; we have tried to make a valid but narrow selection of measures we could use based on the availability of data and the significance of the measure. Immunization against TB in one-year olds was chosen instead of the immunization programme against diphtheria, pertussi and tetanus, due to availability of data, and the notoriety of TB in SSA. To include health care rendered to infants (less than one-year of age), we use birth attended by skilled health staff and to cover quality considerations, we use population per physician, as in early demand studies (Heller 1982; and Akin and others 1985) who

used availability of a physician at the health facility as a measure of quality.¹⁵⁻¹⁶

GNI (Gross National Income) per capita (US\$) was used to approximate the economic situation within the country. The inclusion of income is a necessary control for the universally acknowledged impact of income on health which works through a variety of indirect channels such as, better nutrition, better housing, and better sanitation. Generally, our selection agrees with that of Rosenzweig and Schultz (1982) and (1983), Rosenzweig and Wolpin 1986, who use microeconomic data to attempt to show the causal relations between income, education, and the use of health services on one hand and improved health on the other. ^{17 -19}

Therefore the variables under study (table 1) included the dependent variable; the under five mortality rate, the independent variable; out-of-pocket payment as % of total expenditure on health, 2000. Along with three socioeconomic factors and three health process indicators known to influence the U5MR.

Table 1: Selected key indicators for thirty-seven Sub-Saharan African Countries, 2000

Health Outcome indicators	Under five mortality rate (per 1,000 Live birth),2000
Selected National Health Account Indicator	Out-of-pocket expenditure on health as % of total expenditure on health 2000
Socioeconomic indicators	(a) Improved water source (% of population with access),2000 (b) Adult female illiteracy rate (% of females ages 15 and above),2000 (c) GNI per capita (current US \$)
Process indicators	(a) One-year old fully immunized against TB (b) Birth attended by skilled health staff(%), 1995-2000 ^{a, b} (c) Physician per 100,000 people,1990-99 ^a

^a Data refers to the most recent year available during the period specified.

^b Definitions of skilled birth health staff may vary across countries .Data refer to the most recent available during the period specified or to a running average for a series of years surrounding that period.

Data analysis

Data were analyzed by SPSS, and data were considered insufficient to justify computation if the considered variable had a missing percent greater than 15%. For missing values, in variables, a missing value analysis (MVA) was carried out using SPSS under the assumption that values were missing at random. In this case, the EM means were calculated and used as replacements for missing values in the respective variables. We then obtained complete datasets of all variables under study.

To determine the relationship between the two variables under study in the thirty-seven countries, first we obtained a simple scatterplot of the under-five mortality and out-of-pocket expenditure classified by user fees status of the thirty-seven countries. We case labeled the countries and set markers by user fees to indicate which category the country belonged to (figure 1).

We then determined the strength of this relationship and highlight the effect between the dependent

variable (under-five mortality rate) and the independent variable (out-of-pocket payment, 2000), using regression, table 2. We use a p-value of 0.05 to disprove the null hypothesis

Transformation of the GNI variable

The transformation of the GNI (income) variable to logs achieves two things.

First, every study that has examined the issue has shown a non-linear relationship between mortality and income and over the range of mortality outcome we examine; the non-linearity is adequately captured by a log transformation.

Second, this convenient transformation allows comparisons with earlier results as the regression results provide elasticities. (An elasticity reports the percentage change in one variable for a 1% change in the other variable, and is a useful way to compare empirical results as it is scale neutral).

Results

Table 2: Thirty-seven Sub-Saharan African countries categorized by user fees status, as of 1995.

Category 1	Category 2	Category 3	Category 4
Cost recovery is in place and dominated by National System of user charges	Some National System of Fees but minimal or not enforced effectively	No National System of user fees but some facilities/communities collect fees	No apparent forms of user fees or cost recovery in place
Benin Burundi Cameroon Coted'Ivoire Guinea The Gambia Ghana Kenya Lesotho Malawi Mali Namibia Mozambique Senegal Swaziland Tanzania Zimbabwe	Burkina Faso Equatorial Guinea Ethiopia Guinea-Bissau Mauritania Nigeria Rwanda Sierra Leone Togo Sudan Zambia	Central African Republic Uganda Congo Madagascar Niger Zaire	Angola Botswana Sao Taome
17 countries	11 countries	6 countries	3 countries

Source of categorizations: Shaw and Griffin, 1995.

Table 3: Shows regression coefficients.

	B	t	Sig.
(Constant)	302.721	4.333	0.000
Out-of-pocket expenditure on health as % of total expenditure on health, 2000	-0.424	-1.219	0.233
Improved water source (% of population with access),2000	-0.436	-1.104	0.279
One-year-olds fully immunized against TB	-0.202	-0.592	0.558
Birth attended by skilled health staff (%),1995-2000	-0.622	-1.315	0.199
Illiteracy rate, adult female (% of female ages 15 and above), 2000	0.353	1.191	0.243
Physician per 100,000 people 1990-99	-2.028	-3.110	0.004
LNGNI	-8.326	-0.767	0.449

The coefficients for the independent variables are listed in the column labeled B. The estimated regression equation is: $Y = 302.721 - 0.424 * OOP2000 - 0.436 * Acswater - 0.202 * ImzTB - 0.622 * Basba + 0.353 * Illit - 2.028 * DOCS - 8.326 * LNGNI$

Where Y is the predicted under-five mortality rate and OOP2000 = Out-of pocket expenditure on health as % of total expenditure on health, 2000

Acswater = Improved water source (% of population with access), 2000

ImzTB = One-year olds fully immunized against TB

Basba = Birth attended by skilled health staff (%), 1995-2000

Illit = Illiteracy rate, adult female (% of female ages 15 and above), 2000

DOCS = Physician per 100,000people, 1990-99

LNGNI = Natural log GNI per capita, (current US \$), 2000

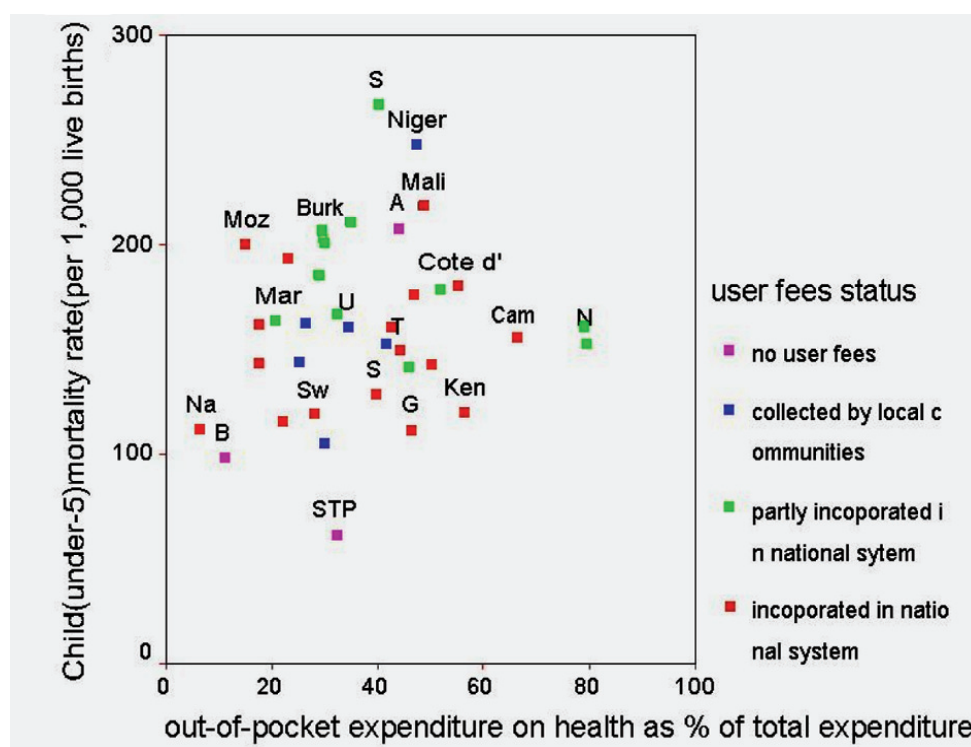
Figure 1: Under five mortality rate (U5MR) with Out-of pocket expenditure payment, 2000 by user fee status.

Fig.1. Country Symbols: S(green), Sierra Leone; Na, Namibia; B, Botswana; STP, Sao Taome and Principe; Sw, Swaziland; G, Ghana; Ug, Uganda; Burk, Burkinafasso; Mar, Mauritania; N, Nigeria; Cam, Cameroon; Cote d',Cote d'Ivoire;Ken, Kenya; Mali; Moz, Mozambique; S(red), Senegal; T, Tanzania; A, Angola; Niger

Discussion

The aim of the study was to test the hypothesis that Privatization (through user fees) has no relation to the reduction in the infant and child mortality rates in Sub-Saharan Africa. But, at a conventional level of 0.05, we reject this null hypothesis. Out-of-pocket payment has a relation in the reduction of U5MR. Reviewed literature shows that at a closer individual and household analysis, user fees have indeed played a role in influencing the health seeking behaviors of the families of these children and hence those willing and able to pay have achieved good health and consequently a reduction in the U5MR.

Plausible as our results might be, we caution our readers to interpret them with care due to the following limitations of the study:

- First and foremost, the selected exploratory design (ecological study design) by virtue of its nature stands a potential bias in an attempt to make causal inference about individual phenomena (for example, individual behavior or attitudes).
- Secondly, the data were analyzed at a country-level, and as such the question about homogeneity (by utilizing the smallest geographical unit) was not applicable. The "country" was our unit of analysis. Furthermore, most health outcomes are not reliably measured in many SSA countries and so much of the data reported into official sources are actually extrapolated from previous years and other assumptions.
- Thirdly, we used cross-sectional data to analysis a phenomena that is 'on-going' and as a result, we will but have information about this phenomena at "a point in time", from which to draw conclusions.
- Fourthly, during the statistical analysis, in an attempt to ensure that all thirty-seven countries were included, no 'outliers' were removed.
- Last but not least, data on private health expenditure is given as a % of total expenditures on health, and is not decomposed into quantities so there is no way of identifying the quantities of privately purchased health services.

However, to minimize the problems of this study and test the etiological hypothesis with country-level data:

- We use regression - not correlation - to estimate the magnitude of the desired association. In this way we ensure internal validity by controlling for

the effects of other variables, making the ecological estimate less biased.

- In an attempt to ensure construct validity and avoid cross-level bias, the aggregate variables (that often measure a different construct than its name-sake at the individual level) were selected on the basis of previous empirical research that had found them significant with in that context of the study.

And therefore, we have made appropriate interpretation of our findings, with the above considerations. Figure 1, represents all thirty-seven SSA countries classified by user fees status as shown in table 1, which illustrates the relationship between under-five mortality and out-of pocket payment 2000. Sierra Leone (category 2) has the highest U5MR at 267. Sao Taome & Principe, by contrast, the U5MR is currently 63 per 1000 live births. In all countries with user fees, more than 100 out of every 1000 children born will die before their fifth birthday. However, despite the fact that figure 1 shows a tendency that the population under-five mortality rate is higher in countries with some form of user fees it also makes clear, exceptions to this rule. Angola for example has no user fees as Botswana and Sao Taome & Principe (category 4) and yet has a high under-five mortality rate at 208. Although, one may argue that Sierra Leone's high U5MR could be strongly attributed to civil wars, the added effect of HIV/AIDS, drought as well as famine in some parts of the country, poor health seeking behaviors and the poor the quality of health care delivery. One can also note that, while as it maybe expected that countries with a high GNI should pause a good enough national economic status where its people are able to pay for health services such as seen in Niger, Mali and Cote d'Ivoire.

There still are some discrepancies that one cannot explain e.g. why Cote d'Ivoire with a high HIV/AIDS prevalence has a better health outcome for U5MR in spite of an almost similar OOP2000 to that of Niger and Mali. This seems to suggest that after 40% (the mean out-of pocket expenditure for all countries is 37.53%), OOP2000 has no significant effect on the mortality i.e. mortality does not seem to infer from the OOP2000. One would expect countries with almost the same mortality rate; Namibia, Swaziland, Ghana and Kenya, to have U5MR decrease with increasing OOP2000, but this is not what is seen to be happening even with countries such as Nigeria, Cameroon and Tanzania .

This variability maybe explained by the results of the regression model which gives the adjusted R square

as 48%, such that, about 52% of the observed outcome cannot be explained by the current data, hence shading some light on the unexplained factor. This variation in U5MR can be explained by a country's socioeconomic factors and health process indicators. In this case being improved water source, adult female illiteracy rate, GNI per capita, one-year olds fully immunized against TB, birth attended by skilled health staff and physician per 100,000 people.

Reviewed literature further emphasizes individual and household reduction of U5MR as reported in some of the empirical analyses of user fees (as an out-of-pocket payment) in African countries overtime. These studies have led to specifications and conditions that need to be associated with user fees so as to present desirable effects, 20 in those willing and able to pay for health care,²¹⁻²² although the argument against user fees still holds; that it may present a barrier to those seeking medical care. There has been considerable research to assess the impact of this policy on the health care seeking behavior of the people.

Many of these studies have concluded that access to health care is generally reduced, especially during the initial stages of implementing the policy (for example, Waddington and Enyimayew 1989; Biritwum 1993; Asenso-Okyere 1995).²³⁻²⁵ Yonder (1989) found that "up to 17%" patient visits in Swaziland, designed to protect against childhood diseases, BCG and DPT immunizations, or against dehydration in children, show average attendance declines of -16,-19, and -24% respectively.²⁶

In some instances, however, this reduction has been limited or may not have occurred if people perceived the charges to be associated with improvements in the quality of the services provided, like availability of drugs or quality of care (Lavy and Germain 1995; Mwabu et al. 1995).²⁷⁻²⁸

However, other than these hospital attendance studies, further studies have shown that costs, self medication and other practices maybe another way in which user fees may affect health seeking behaviors. In Tanzania, among the inhabitants of Ifakara in Kilombero District, the referral hospital with 370-beds adopted a fee-for-service basis in 1993. Within the hospital, separate fixed charges for consultation, admission, examination, laboratory and operation services were required to be paid in cash, and before treatment was given. As a result, the inhabitants who locally recognize illnesses like malaria, schistosomiasis, diarrhoeal diseases or 'worms' as conditions best man-

aged by the hospital with its technical examination tools and medical reports that make correct diagnosis, preferred to seek health care services from 'knowledgeable' elderly women who were known to administer herbal remedies, and were specialists in treating childhood illnesses because their costs were modest or free of charge, while as the hospital offered tough alternatives; 'no cash means no treatment'.²⁹ Likewise, in Ghana cost seemed to be a major deterrent to many people who would have liked to attend a clinic. During a survey in one rural community, the research team witnessed a woman whose child had severe diarrhoea but she could not take the child to the health centre because she could not afford hospital bills. In a similar incident in another rural community, a sick child who had convulsions was being treated with herbs because of the parents' inability to pay the user charges or buy drugs from the hospital, which was only five kilometers away. In both these cases, when the research team offered to pay for the cost of the treatment, the child was sent to the hospital.³⁰

In addition to not being able to afford hospital bills, many practice 'wait-and see' strategies, where people expect their illnesses to be self-limiting and thus resort to self-medication to avoid user charges and transportation costs to and from health care facilities. Asenso-Okyere and Dzator (1995) found that self-medication was the first choice of treatment for 65.8% of children when they contracted mild fever and in the case of babies, 57.0% of their caretakers, usually their mothers, give treatment to the infants before seeking alternative care.³¹ In Uganda, among the inhabitants of *Hamuganda* village in Kabale District, self-medication with herbal medicines or allopathic medicines for a variety of conditions, including dysentery and worms is common in spite of the fact that Kabale hospital is within 30 km traveling distance from the village. Hospital care is very much a last resort because of perceived high cost of treatment and the difficulty in transportation given the distance and the hilly terrain.³²

Furthermore, in Iganga District (Uganda) among the inhabitants of *Bulyabwita*, during a community survey, many respondents complained that the quality of care at public facilities depended on the amount of money offered for treatment. "The health worker asks if you came with your 'brother', which means with money". In view of these reports, it is evidently clear that out-of-pocket payments have indeed influenced the health seeking behaviors; hospital attendance, self medication and other practices of the these communities. We advance the debate that paying a fee

at these health facilities has helped the communities as reported above, because it is important to remember that these fees, are actually incorporated into a number of intangible services that are provided to the people i.e. in maintenance costs, determining level of prices charged/cost, sustainability and improvement of the health services thus leading to availability of quality health services. Without a user fee, even the minimum packet of health care recommended by government would be difficult to achieve, let alone being appreciated by the recipient.

In the regression analysis, the null hypothesis that out-of-pocket payment has no relation to the reduction of U5MR been rejected, at a ($p=0.233$) and CI (-1.136-0.288). Allowing us to accept the hypothesis that out-of-pocket payment has a relation to the reduction of U5MR. This has indeed been supported by the literature review and the information drawn from the graphical presentation of the 37 Sub-Saharan countries.

These findings are in keeping with UNICEF's suggestion, that, under five mortality rates as a principal indicator, measures an end result of the development process rather than an 'input' such as school enrollment level, per capita calorie availability, or number of doctors per thousand - all of which are means to an end. "It is also the result of a wide variety of inputs: the nutritional health and health knowledge of mothers; the level of immunization and the use of oral rehydration therapy (ORT); the availability of maternal and child health services (including prenatal care); income and food availability in the family; the availability of clean water and sanitation; and the overall safety of the child's environment." ³³

Policy Implications

Governments of Sub-Saharan African countries should look towards incorporating and developing other forms of substituting private for public sources of funding besides user fees, such as, private health insurances, community-based health insurance schemes and social health funds, because public health care for all at some point seems to be free and accessible. For one, the fees provide a way to mobilize more money for health care than existing public sources provide and also in a way improve efficiency by moderating demand and containing costs.

As an instrument of health policy, user fees should be implemented in selected and specific government health facilities depending on the country's health expenditure since they do have potential side effects in terms of equity and accessibility of health care. Being

that most Sub-Saharan populations are unable to access health care because of poverty, and yet user fees do shift the burden away from population based, risk sharing arrangements such as the tax-based funding, towards the payments by individuals and households.

Conclusions

In the light of these arguments, user fees as our proxy measure for privatization in the health sector has enabled us to explore this relation, being able to cover a holistic perspective of most SSA countries, and pointing out that the U5MR in these countries is still being influenced by many other factors including HIV/aids, wars, drought and famine, besides the health policies such as the user fees. However in spite of this, this paper has succeeded in its initial mission of documenting the role of privatization in the health sector and how it relates to infant and child mortality rates in Africa.

We recommend that research based around community based health funds and social health insurance funds in Sub-Saharan African countries be carried out to analyze the role these funds have to play in the rural communities and elite populations respectively, as a way forward into advancing the debate in privatizing health care in Sub-Saharan Africa.

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