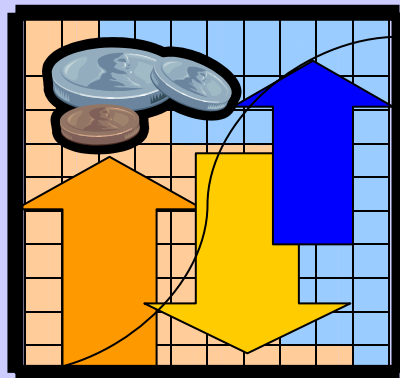




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**An empirical model of access to health
care, health care expenditure and
impoverishment in Kenya:
learning from past reforms and lessons
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**An empirical model of access to health
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impoverishment in Kenya:
learning from past reforms and lessons
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by

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and
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1) Introduction

In the early 70s, Kenya basically had a predominantly tax-funded health system, but then gradually introduced a series of health financing policy changes. In particular user charges for health services were introduced in 1989. Today, these user fees still exist and their impact on health care access has been the subject of several empirical studies. A National Hospital Insurance Fund (NHIF) was also introduced but this was only compulsory for the formal sector workers and has been associated with an inadequate insurance benefit package. However, in November 2004, a new health financing reform was adopted in Parliament, involving the establishment of National Social Health Insurance Fund (NSHIF) with the intent to cover all of the Kenyan population. An overview of health financing reform in Kenya is given in section 2.

The implementation of a well run and effective NSHIF will be a formidable challenge. The main objective is to grant all population groups, including the poor, access to a comprehensive benefit package of inpatient and outpatient health services. In addition, any remaining out-of-pocket payments for insured health services, i.e. co-payments, should not be such that households remain confronted with catastrophic health care expenditures or fall into poverty.

The empirical research undertaken in this paper focuses on the impact of the Kenyan health financing system in the year 2003 on access to care and health spending. It will also shed light on the extent to which the prevailing system impoverished the population, as a result of the lack of a functional which there were waiver and exemption mechanisms built into the user fee system, at least on paper, which did not work in practise for various reasons. Research methods and data are discussed in section 3. We present the empirical results in section 4. These results will help to formulate a number of key lessons for Kenyan policy-makers in section 5. We conclude in section 6.

2) Health financing reform in Kenya: an overview

Kenyan policy makers have recognized that health care in Kenya is relatively costly, as a result of the widespread user fees at government health facilities together with other out-of-pocket payments at NGO and other private health facilities. It is also acknowledged that this high cost is inhibiting access to health care and is one of the leading causes of poverty(1). Indeed, the share of out-of-pocket expenditure in total health expenditure was 51.1 % in 2002(2) The latter share includes the user fees at government facilities also referred to as 'cost-sharing' in Kenya.

Cost-sharing was not part of the policy discussion between 1965 and 1989, when the health financing system in Kenya was supported primarily via general tax revenue. However, in the late eighties, cost-sharing started to attract considerable policy attention. In 1989, severe government budgetary constraints led to the introduction of user fees for outpatient and inpatient care at government health facilities. Yet, for children under five and for specific ailments, an exemption from fees was introduced. In addition, health care at dispensaries would still be delivered free of charge. In 1990, as a result of widespread protest the user fee policy was reformed with outpatient registration fees being removed, while keeping the other fees.

Several studies have pointed at the negative impact of user fees on utilization of health care services in Kenya. A study(3) on the use of health services in Kibwezi, a poor rural region, revealed that outpatient care increased again after the lifting of the registration fees. Similarly, a study on health care seeking behaviour in Kisumu and Embu districts showed that outpatient attendance at government health facilities had dropped by about 50% during the initial cost-sharing period of 1989(4); attendance rose again by about 41% subsequent to the suspension of the outpatient registration fees. Results from research(5) on the impact of user fees on attendance at a referral centre for sexually transmitted diseases (STD) confirm the empirical findings above; at Nairobi's Special Treatment Clinic for STD, attendance by men dropped by 40% during the user-fee period and rose again when fees were suspended, although only to 64% of the attendance level in the period before the introduction of user charges.

The fiscal situation in Kenya remained problematic, however, and the Government decided to reintroduce 'treatment' fees in 1992. Knowing about the negative effects on utilisation, the Government introduced these fees in phases, first in national and provincial hospitals and then district hospitals and health centres. Treatment fees would only have to be paid when treatment was effectively available. Utilization of outpatient care in hospitals did drop although more modestly, namely by 6% compared to the period where fees were suspended. This modest reduction was not only attributed to the linkage of fees to effective treatment, but also to better exemption rules(6).

The user fee system has continued to the present day. In June 2004, there was a policy statement by the Minister of Health, however, stipulating that health care at dispensary and health centre level would be free for all citizens, except for a minimal user fee in government hospitals (7). However, the most important event in the history of health financing in Kenya since the introduction of the user fee policies in 1989 has been the interest of the Government of Kenya in early 2004 to introduce a social health insurance system. The purpose of such a system is to ensure access to outpatient and inpatient health care for all Kenyans and to significantly reduce the out-of-pocket health care expenditure of households, especially of the poorest. In May 2002, an inter-sectoral Task Force was established to prepare a national strategy and legislation which would be a first step in the preparation of Kenya's National Social Health Insurance Fund (NSHIF)(8). After a series of policy debates and subsequent deliberations in parliament, the latter passed the NSHIF Bill on December 9th 2004. However, the president who was expected to ratify the NSHIF Bill following parliament's acceptance, decided it still needed amendments and returned it to parliament for debate.

It is important to note that Kenya already had a hospital care insurance being provided via the 40-year old National Hospital Insurance Fund (NHIF), with all employees being compulsorily insured and making monthly statutory contributions. The NSHIF Law, however, entails a formidable challenge for the Kenyan health financing system, as it has universal coverage as its main principle. One major challenge for health financing reform therefore will be to systematically enrol all of the Kenyan population, to start with workers and civil servants, to be followed by the self-employed and informal sector workers, into the new NSHIF Fund. It is the old NHIF that will be transformed into this new Fund. Another important challenge is to drastically improve the financial protection provided through social health insurance. Indeed, although it reached about 7 million beneficiaries, the NHIF only covered the 'hotel' part of

inpatient health care costs; i.e. the insured NHIF members still needed to pay out-of-pocket fees for treatment, diagnosis and pharmaceuticals(9).It can therefore be understood that financial protection by the NHIF was quite weak.

The empirical analysis on the impact of the health financing system that prevailed in 2003 will be introduced in the next section. The empirical results will be used, among others, to alert the policy maker to the pitfalls that ought to be avoided during both take-off and implementation of the new NSHIF.

3) Research methods and data

This section addresses the methodology and the data used in this study. It begins with a number of theoretical hypotheses on the determinants of health insurance membership, utilization of health services, out-of-pocket payments and catastrophic health expenditure. It then introduces the econometric models used in each part of the analysis. The section also includes indicators used to address the poverty impact in relation to health service utilization and out-of-pocket health expenditures.

II.1. 3.1 Theoretical considerations

Hypotheses for each part of the study are formed based on theoretical considerations and experiences from previous studies.

3.1.1 Determinants of health insurance coverage

Prepayment schemes, such as employment-based insurance, private individual health insurance and community-based insurance, are small scale and other than community-based insurance target wealthier and low-risk population.. Membership of NHIF will be tested separately from other prepayment schemes because of its different nature. Clearly one would expect those in employment to be much more likely to have NHIF membership. Conversely, those aged greater than sixty five or less than five are expected to be less likely to have those insurance.

Further factors expected to have an effect on the probability of both NHIF and other insurance membership include household income, the education level of the household head, the sex of the individual, severity of disease, and the presence or availability of health insurance schemes at provincial level. For all of these factors other than health insurance availability, their positive effects will be qualified to some extent by the compulsory nature of the NHIF. For severity of disease, this is further qualified by likely risk selection by private health insurers. Note finally that a potentially important factor effecting membership that couldn't be tested is an individual's attitude to risk, given the available survey questions.

3.1.2 Determinants of utilization of health care

The purpose of this analysis is to explore the determinants of health care utilization, given the need for outpatient care and for inpatient treatment as prescribed by a health care provider. Utilization of inpatient and outpatient care were analysed separately. The primary variables of interest here are health insurance and income. We test whether the probability of using health care rises as a result of membership of a health insurance scheme and of an ill person's higher income.

Other individual, household and geographical characteristics are controlled for. These are the same control variables as those used in the analysis of the determinants of health insurance coverage, although not always with the same expected coefficient. This is the case for those aged less than five, whom we expect to have greater access to health care, given need. But, in the context of Kenya, we submit this is primarily due to specific government policies that financially support outpatient and inpatient care to all under fives.

Conversely, we expect those aged greater than sixty five to have lower access. This is because there is no special government programme for this population group, and also because households typically seem to give higher priority to the health care of those working than to those not working. For women, the expected effect is less clear cut. On the one hand, we expect greater access given need, because of specific Ministry of Health programmes for reproductive health. On the other hand, this may be offset by factors reflecting gender inequality that constrain access to health care by women. Other variables - education, employment, chronic health conditions and variables on administrative regions which reflect the varying availability of health service - have the same expected effects as in the analysis on health insurance membership.

3.1.3 Determinants of out-of-pocket health expenditures

We are primarily interested in the effects of health insurance membership on OOP. Out-of-pocket health payments refer to payments for health care made by households at the point of receiving health services. It is a priori expectation that health insurance membership should significantly reduce the level of OOP, given use. As with the analysis of health care utilization, outpatient and inpatient care are analysed separately.

Individual, household and geographical factors are controlled for, with similar rationales for inclusion as in the models discussed so far. We expect those with higher income, chronic health conditions, aged greater than sixty-five, living in urban areas, including Nairobi to have higher OOP. For those living in urban areas and/or Nairobi, this could also reflect the availability of services of higher quality as well as supplier induced demand. Those aged less than five are expected to have lower OOP, because of special government policies for this age group. Two additional variables are included, related to facility ownership. It is expected that private health facilities charge higher user fees than both mission and public health facilities. We are also interested in comparing public and mission facilities to see if there is a significant difference in the user fees charged.

3.1.4 Determinants of catastrophic expenditure

In this section, we explore the factors associated with catastrophic health expenditure, which is defined as the out-of-pocket payments for health care equalling or exceeding 40% of non-subsistence household spending on health care. Catastrophic expenditure occurs when households with low capacity to pay and no additional social health protection such as health insurance, are confronted with relatively high out-of-pocket expenditure. We therefore expect that health insurance membership and a higher household income would help reduce the possibility of catastrophic expenditure. Next we discuss the other determinants:

First, the fees required vary by type of health provider and health care service: we expect that the inpatient services and services provided by private facilities are more likely to cause catastrophic expenditure compared to outpatient services and public facility services.

Secondly, self-reported illness will also be tested in the model. Household members with perceived illness would be more likely to use health services and therefore have a higher probability of facing catastrophic expenditure.

Thirdly, households located in an urban area are less likely to face catastrophic expenditure as they have more means to mobilize resources in order to cope with medical bills compared to those living in a rural area at the same income level.

Fourthly, in a decentralized health system, administrative regions reflect differences in organizing health services and the geographical distribution of health facilities. Dummy variables on provinces will also be tested in the study.

Fifthly, for the same reason as mentioned before, we expect that a household with members under 5 years old is less likely to face catastrophic expenditure. However, we are not certain concerning the results for a household with members above 65 years old. On the one hand they need more services which could cause more catastrophic expenditure; on the other hand they also use fewer services given the reported illness.

Finally, variables such as the education level and the working status of the household head are expected to be negatively related to catastrophic expenditure.

3.1.5 Summary

In Table 1 we provide a summary of the determinants of health insurance membership, utilization of health care and out-of-pocket health care spending, together with their expected effects. The determinants of catastrophic expenditure together with their expected effects are presented in Table 2.

Table 1: Determinants of health insurance membership, utilization of health care and out-of-pocket expenditure, and their expected effects

Variables	Proxy from survey	Expected coefficient:			
		Model 1a	Model 1b	Model 2	Model 3
Income	Quintiles (dummy = quintile 1)	+	+	+	+
Gender	Male	+	+	+/-	+/-
Severity of disease	Chronic health condition	+	+	+	+
Health insurance	Private health insurance	NA	NA	+	-
	Public health insurance (NHIF)	NA	NA	+	-
Age	Age < 5	-	-	+	-
	Age > 65	NA	-	-	+
Employment	Working (head)	+	+	+	NA
Education	Education (head)	+	+	+	-
Physical access	Urban	+	+	+	+
	Provinces (dummy = Nairobi)	-	-	-	-
Facility ownership	Public health facility	NA	NA	NA	+/-
	Private health facility	NA	NA	NA	+

Notes:

NA means 'not applicable'

Model 1: Probability (health insurance membership) = $\alpha + \beta X$

...where model 1a refers to NHIF membership and model 1b to all other health insurance membership

Model 2: Probability (visit > 0 | illness) = $\alpha + \beta X$

Model 3: Log (out-of-pocket expenditure | utilisation) = $\alpha + \beta X$

Table 2 Determinants of catastrophic expenditure (household level) and their expected effects

Variables	hypothesis	variables	hypothesis
Utilization		Illness	
outpatient service (public)	+	with members reported illness	+
outpatient service (private)	+	Province	?
inpatient service (public)	+	Other variables	
inpatient service (private)	++	urban	-
Income		currently working	-
2nd quintile	-	secondary school & above	-
3rd quintile	-	with members under 5 yrs	-
4th quintile	-	With member above 65yrs	?
5th quintile	-	covered by insurance	--

Note: '+', increases catastrophic expenditure; '-', decreases catastrophic expenditure; '?', not certain.

III.1. 3.2 Econometric models

In order to test the hypotheses on health insurance membership, health service utilization and catastrophic expenditure, logistic regression models were applied. The probability of the event y occurring is $\Pr(y = 1 | X)$, with the odds ratio (OR) being:

$$OR = \frac{\Pr(y = 1 | X)}{\Pr(y = 0 | X)} = \frac{\Pr(y = 1 | X)}{1 - \Pr(y = 1 | X)} \quad (1)$$

where X is a vector of independent variables.

The odds ratio indicates how often the event happens, relative to how often it does not under a certain circumstance. It ranges from 0 when $\Pr(y = 1 | X) = 0$ to ∞ when $\Pr(y = 1 | X) = 1$.

After logit transformation, the linear model can be written as:

$$\ln\left(\frac{\Pr(y = 1 | X)}{1 - \Pr(y = 1 | X)}\right) = X\beta \quad (2)$$

where β is a vector of parameters.

The econometric results will also feature 'odds ratios' that are associated with each explanatory variable. This odds ratio associated with an explanatory variable refers to the amount by which the odds favoring $y=1$ are multiplied, when there is a unit increase in that variable, given that the values for the other explanatory variables stay constant.

The marginal effect is also reported in this study. It is computed as a discrete change in probability when there is a change from 0 to 1 for an independent variable, taking all the other independent variables as constant. In this case, the mean of the other independent variables are used.

$$\frac{\Delta \Pr(y = 1 | \bar{X})}{\Delta x_i} = \Pr(y = 1 | \bar{X}, x_i = 1) - \Pr(y = 1 | \bar{X}, x_i = 0) \quad (3)$$

In the analysis of health insurance membership, regressions were run for both private health insurance and public health insurance (the NHIF). The dependent variable is 1 for membership and 0 otherwise. The unit of analysis was the individual.

The regressions on health service utilization were applied to individuals with perceived need. Separate regressions were run for outpatient and inpatient care. For outpatient care, the regression was applied to individuals who reported illness in the previous four weeks. For inpatient care, the application was to those who required inpatient service in the previous year. In each regression, the independent is variables 1 for those who used services and 0 otherwise. The unit of analysis was the individual.

For catastrophic expenditure analysis, the binary independent variable was defined as 1 when a household's health expenditure is equal to or above 40% of its capacity to pay and 0 otherwise. The unit of analysis for the regression was the household.

A log-linear model was used to explore the determinants of out-of-pocket health expenditures (*oop*), given utilization of health services. The unit of analysis was the individual. As with the utilization analysis, outpatient and inpatient care are run separately. The general regression model can be summarized as:

$$\log(oop | use = 1) = \alpha + \beta X + \varepsilon$$

where *use* refers to the use of inpatient or outpatient services in corresponding regressions, *X* is a vector of individual, household and geographical characteristics; and ε is the residual.

A number of those surveyed mention use but did not report out-of-pocket health expenditures (OOP). Since these same respondents also failed to answer further questions related to utilization (such as which health facility they visited), they were treated as missing observations in the regression of out-of-pocket payments. A Heckman regression was initially applied, with the null hypothesis being that the distribution of these unobserved values is the same as that of the observed values.

In a previous study by Waters (1999) in the context of Ecuador(10), it was demonstrated how important the selection bias could be. Indeed, the impact of health insurance membership on utilization could be overstated as soon as unobservable factors influence both health insurance membership and health care use. For this reason, we also undertook a Hausman test in the equations for health care utilization and OOP. The test was done when the impact of health insurance membership was found to be significant at the 20% level.

IV.1. 3.3 Poverty measures

The poverty line used in this study is set at the value of food expenditure of the household with median food share in total household expenditure then adjusted for household size(11) . Still, in order to minimize possible measurement errors in the survey, the subsistence need in this study is finally estimated using the average food expenditure of households whose food share of total expenditure was in the 45 to 55 percentile range. A household whose total consumption expenditure is smaller than the poverty line is regarded as poor. Two indexes are used in measuring the poverty impact: differences in the headcount and the poverty gap between post and pre-health payments.

The difference in headcount (*DH*) is used to measure the extent of impoverishment. It can be written as $DH = H_a - H_b$, where H_b is the headcount before health payments and H_a after health payments.

The intensity of health payments on poverty is measured by the difference in poverty gap (*DG*) before and after health payments, or $DG = G_a - G_b$, where G_a is the poverty gap after health payments and G_b is the poverty gap before health payments, and

$G = \frac{1}{n} \sum (z - y_i)$ if $y_i < z$, z is the poverty line and y_i is the income of the i th household and n is the number of households.

V.1. 3.4 Data and variables

Data used in this study came from the Kenyan Health Expenditure and Utilization Survey, conducted between February and March 2003. It is a nationally representative survey, including 8,407 households with a total of 38,009 individuals. The survey collected information at both household and individual levels, including socio-economic status, health insurance coverage, self-reported illness, health service

utilization and payments for each individual and household expenditure for each family.

For health insurance coverage, each individual was asked if he/she was covered by health insurance. For those who gave a positive answer, a question on the specific type of insurance followed: whether the person was a member of the NHIF, private individual insurance, employer-based insurance, community insurance, or others. In our analysis, the latter three types are combined into a single "private insurance" variable.

For utilization of health care, different timeframes were used for outpatient and inpatient care. For outpatient care, individuals were asked if they had been ill in the last 4 weeks. For those reporting illness, questions on the use of health services and the out-of-pocket payments were asked. For inpatient care, individuals were asked if they were required to have inpatient treatment in the last 12 months and whether they had received this required treatment, and if so where and how much they paid(12).

Questions related to out-of-pocket health expenditure (OOP) and other household expenditures were asked in different sections with different timeframes. As mentioned above, OOP on outpatient services was asked in the section of utilization of outpatient services. The recall period is 4 weeks. OOP on inpatient service was asked in the section of utilization of inpatient services. The recall period for inpatient OOP is one year. Routine OOP, including for routine medication, vitamins, family planning commodities and services, was asked independently for 4 weeks. Household expenditures on food and other basic items were asked for one month and the durable goods for one year.

Catastrophic health expenditure is defined in relation to a household's capacity to pay. A household is considered to face catastrophic expenditure when its total out-of-pocket health payments equal or exceed 40% of its capacity to pay(13). OOP typically include doctors' consultation fees, purchases of medication and hospital bills. Although spending on alternative and/or traditional medicine is included in out-of-pocket payments, expenditure on health-related transportation and special nutrition are excluded.

Both income and expenditures were collected in the survey. Reported consumption expenditure is used to measure a household's capacity to pay. This choice is based on two reasons. First, the variance of current expenditure over time is smaller than the variance of current income. Income data reflect random shocks, yet expenditure data conform better to the notion of capacity to pay. Second, in most of the household surveys expenditure data are more reliable than income data. This is particularly true in developing countries, where the informal sector is typically relatively large and survey respondents may not wish to reveal their true income for various reasons (14). The same argument applies to the choice of expenditure quintiles used in the regressions rather than income quintiles.

4) Empirical results

This section presents both descriptive and econometric results.

VI.1. 4.1 General description of key indicators

Results from the descriptive analysis by poor and non-poor are summarized in Table 3. According to the poverty line defined in this study, about 29% of households are living in poverty. The survey suggests that 16.5% of the population experienced illness or injuries during the previous four weeks. Among them, 69.3% obtained all and 5.8% obtained part of the services required. The remaining 24.9% of those reporting illness did not receive any service. The proportion of self-reported illness is slightly smaller among the poor than the non-poor even though the poor suffers more illness than the non-poor. It is a common feature of self-reported illness in a survey that the non-poor perceive themselves to be suffering as much and even more illness than the poor(15). The proportion of the population who could not access outpatient services or could not obtain all the visits required is much higher among the poor than the non-poor.

2.6% of the population had been required by doctors for inpatient services during the previous year, among which 24.7% could not receive them. The percentage of required inpatient services was lower among the poor than the non-poor as the poor has fewer opportunities to see doctors. For those who required inpatient treatment, 34.5% of the poor and 21.7% of the non-poor could not access these services.

For those who could not access the service required, 40.5% reported financial difficulties as the main reason, with 51.9% among the poor and 32.8% among non-poor reporting that they could not afford the service. Furthermore, because of the paying for health services, 4.1% of households were facing catastrophic expenditures (2.7% for the non-poor and 7.7% for the poor) and 1.5% of households were pushed under the poverty line. For those who were already under the poverty line, the poverty gap was enlarged by 336 shillings per year due to paying for health services.

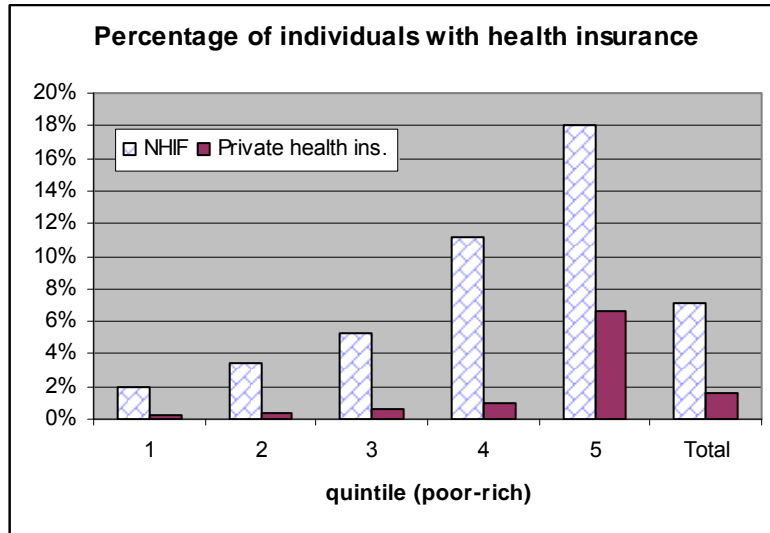
Table 3 Key Indicators

	% of non-poor households	% of poor households	% of total households
Outpatient service reporting illness	16.6%	16.1%	16.5%
not use	21.4%	33.0%	24.9%
use part	5.3%	6.7%	5.8%
use all	73.3%	60.2%	69.3%
Inpatient service Required	2.8%	1.9%	2.6%
not use	21.7%	34.5%	24.7%
Could not afford	32.8%	51.9%	40.5%
Households with catastrophic expenditure	2.7%	7.7%	4.1%
Households impoverished			1.5%
Poverty gap difference (shillings) per year			336
Overall health insurance coverage (various)	12.1%	2.6%	9.1%

VII.1. 4.2 Health insurance coverage

It is estimated that 9.1% of the population have some form of health insurance coverage. 7.1% are members of the NHIF and 1.6% of the population are covered by some other forms of prepayment schemes. Health insurance coverage varies across income quintiles, as Figure 1 illustrates.

Figure 1



The regression results are presented in Table 4. Results suggest that health insurance membership in Kenya is determined by the institutional environment as well as by an individual's evaluation of the relative benefits of membership. Note, though, that only 618 individuals of the sample (1.63%) reported any form of private health insurance membership. Richer individuals and those in employment are more likely to have health insurance, with working individuals particularly likely to have NHIF membership.

Education has a significant positive effect on the likelihood of membership, especially for private health insurance. Men and those with chronic health conditions are more likely to have private health insurance, but this is not the case for NHIF membership, where differences are insignificant. This may well reflect the fact that private health insurance is always voluntary, whilst NHIF is generally compulsory. Urban dwellers are more likely to be members of the NHIF, reflecting a greater availability of NHIF in urban areas as compared with rural areas. Private health insurance membership is much more likely for those living in Nairobi than elsewhere, which is not surprising given that private insurers are almost exclusively found in the capital. More surprisingly, though, is the result that those living in Nairobi are less likely to have NHIF membership than in all other provinces except the North Eastern province.

Table 4: Probability of health insurance membership

Variables	NHIF					Other health insurance				
	Coeff.	OR	S.E.	P> z	dy/dx	Coeff.	OR	S.E.	P> z	dy/dx
Quintile 2	0.485	1.624	0.163	0.000	2.19%				----	
Quintile 3	0.818	2.266	0.220	0.000	4.14%	0.432	1.541	0.317	0.036	0.21%
Quintile 4	1.590	4.902	0.457	0.000	10.59%	0.421	1.524	0.299	0.032	0.20%
Quintile 5	1.848	6.348	0.600	0.000	13.47%	1.594	4.923	0.846	0.000	1.23%
Male			----			0.129	1.137	0.097	0.133	0.05%
Chronic health condition			----			0.318	1.374	0.235	0.063	0.15%
Age < 5	-0.127	0.881	0.057	0.052	-0.48%				----	
Age > 65			NA						----	
Working (head)	1.416	4.119	0.192	0.000	8.02%	0.706	2.026	0.245	0.000	0.27%
Education (head)	0.569	1.767	0.097	0.000	2.12%	1.294	3.647	0.417	0.000	0.79%
Urban	0.140	1.150	0.062	0.009	0.57%				----	
Central	0.381	1.463	0.136	0.000	1.73%	-1.870	0.154	0.028	0.000	-0.45%
Coast	0.443	1.557	0.138	0.000	2.07%	-1.305	0.271	0.040	0.000	-0.36%
Eastern	0.949	2.582	0.246	0.000	5.24%	-1.514	0.220	0.044	0.000	-0.41%
North Eastern	-0.698	0.498	0.090	0.000	-2.15%	-4.349	0.013	0.013	0.000	-0.60%
Nyanza	1.350	3.857	0.325	0.000	8.72%	-1.571	0.208	0.036	0.000	-0.41%
Rift Valley	1.110	3.034	0.248	0.000	6.31%	-2.012	0.134	0.022	0.000	-0.52%
Western	0.726	2.067	0.183	0.000	3.70%	-1.901	0.149	0.030	0.000	-0.47%
Number of observations					38009					38009
Chi value					3598					1679
Prob > Chi value					0.000					0.000
Correctly classified					92.5%					98.4%

NA: not applicable

----: not statistically significant at 0.2 level.

VIII.1.4.3 Health service utilization

Utilization of outpatient health services varies across income quintiles. Compared to the other income groups, the poorest quintile used fewer services when needed, and more frequently they could not complete the whole course of the treatment, with 39.7% not able to access all necessary treatment. Further, 2.6% of the sample required inpatient treatment, with higher income groups reporting a greater need for these services. Among those who needed inpatient treatment, the admission rate was fairly low for the poorest quintile: 37% could not access the treatment.

Figure 2

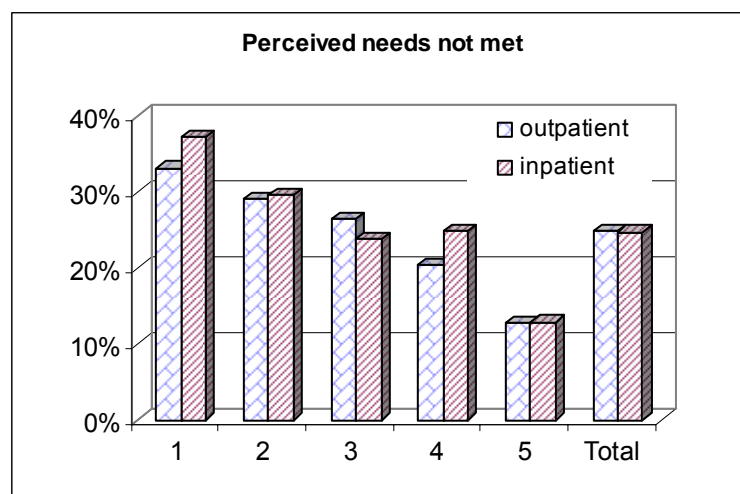


Table 5 presents the regression results. For both outpatient and inpatient care, the regressions are highly significant. The results suggest that richer individuals are much more likely to use health care when they need it than the poor. For instance, the richest quintile is 2.9 and 2.5 times more likely than the lowest income quintile to access outpatient and inpatient care respectively, given need. The slightly weaker income effect for inpatient care is probably due to inpatient care being for more life-threatening conditions and thus less sensitive to income differences. The effect of health insurance, though, is not as strong.

Whilst for inpatient care both private and public health insurance have odds ratios that are greater than one which indicates that individuals with health insurance have greater access to health care. However, the variable of other insurance is not statistically significant and the variable of NHIF is only significant at 20% level. Result from Hausman test accepts the null that insurance membership is an exogenous variable.

Other individual and household characteristics also affect access to health care, with the age, gender and health condition of the individual seeking care having an impact, as well as the education level of the household head. For outpatient care, children under five and females have greater access to health care, everything else being equal, evidence that the Kenya government's policies on child and reproductive health are effective in providing access for these groups. This effect, though, doesn't extend to inpatient care. Those over sixty five years old and with chronic health conditions have worse access to health care, as expected. Both imply that these population groups have to resort more often to various coping strategies than others. One reason might be that their needs are not always met by the health services currently offered, with important equity implications. Finally, access also seems to be related to geographical location, with those living in Nairobi the most likely to use health care given need, everything else being equal. Those living in the North Eastern province, a poor and remote region, have particularly low access.

Table 5: Probability of using health care, given need

Variables	Outpatient care					Inpatient care				
	Coeff.	OR	S.E.	P> z	dy/dx	Coeff.	OR	S.E.	P> z	dy/dx
Quintile 2	0.2551	1.291	0.114	0.004	3.91%	0.357	1.430	0.350	0.144	5.23%
Quintile 3	0.3682	1.445	0.134	0.000	5.52%	0.475	1.609	0.387	0.048	6.88%
Quintile 4	0.6233	1.865	0.192	0.000	8.86%	0.397	1.487	0.375	0.116	5.79%
Quintile 5	1.0574	2.879	0.345	0.000	13.71%	0.916	2.500	0.741	0.002	12.27%
Male	-0.1498	0.861	0.054	0.017	-2.41%					
Chronic health condition						-0.543	0.581	0.106	0.003	-9.31%
Private health insurance	-0.2253	0.798	0.219	0.411	-3.85%	1.165	3.207	3.443	0.278	12.68%
Public health insurance (NHIF)			NA			0.441	1.554	0.507	0.177	6.18%
Age < 5	0.5718	1.771	0.146	0.000	8.32%					
Age > 65	-0.4048	0.667	0.081	0.001	-7.18%	-0.489	0.613	0.170	0.078	-8.66%
Working (head)										
Education (head)	0.2262	1.254	0.104	0.006	3.51%	0.492	1.635	0.328	0.014	7.27%
Urban										
Central	-0.4686	0.626	0.085	0.001	-8.31%	-0.942	0.390	0.124	0.003	-17.77%
Coast	-0.8933	0.409	0.053	0.000	-17.14%					
Eastern						-0.540	0.583	0.204	0.122	-9.55%
North Eastern	-2.7111	0.066	0.009	0.000	-58.66%	-1.680	0.186	0.086	0.000	-36.58%
Nyanza	-1.1517	0.316	0.034	0.000	-22.03%	-1.191	0.304	0.086	0.000	-21.82%
Rift Valley	-0.5707	0.565	0.070	0.000	-10.21%	-0.472	0.624	0.200	0.142	-8.13%
Western	-1.3289	0.265	0.031	0.000	-26.80%	-0.912	0.402	0.133	0.006	-17.29%
Number of observations					6615					1049
Chi value					775.17					93.37
Prob > Chi value					0.000					0.000
Correctly classified					79.2%					78.5%

NA: not applicable

-----: not statistically significant at 0.2 level.

IX.1. 4.4 Out-of-pocket payments for outpatient and inpatient services

The average individual out-of-pocket payment for outpatient services is 47 shillings per month. For inpatient services, the average is 130 shillings per year. Out-of-pocket expenditures vary largely across income groups, as evidenced by the following regressions and the section on catastrophic expenditures.

The Heckman regression showed no significant difference between the observed and unobserved values, thus supporting the assumption that those respondents who failed to answer further questions related to utilization can be treated as randomly missing. Thus a conventional ordinary least squares regression was then run. The regressions for both outpatient and inpatient care are highly significant (see Table 6 below).

The impact of health insurance variables is not statistically significant for inpatient OOP. For outpatient OOP, the private health insurance membership increased OOP at 20% statistical significant level. Again the Hausman test accept the exogeneity of health insurance membership. These results provide further evidence that health insurance membership in Kenya does not currently offer significant financial protection, and that reform is needed. It stands to reason that richer individuals are spending more OOP than the poor for both outpatient and inpatient care, reflecting a greater capacity to pay.

In contrast to health insurance, government policies for young children and on reproductive health seem to be more effective in improving financial protection, with both under fives and females paying less OOP, everything else being equal, although the latter is less in evidence for inpatient care. Those older than sixty five seem to pay more OOP, as do those with chronic health conditions using outpatient facilities. Having a higher level of education has a negative coefficient for outpatient care only. Regarding geographical characteristics, whilst the urban-rural difference was insignificant, those living in provinces outside Nairobi generally had lower or equivalent OOP, although the opposite held true in the North Eastern province for outpatient care.

This illustrates non-uniform user charges, with those living in the North Eastern province having both the worst access and financial protection against health care. Finally, those visiting private health facilities have higher OOP than all other facilities, with those visiting public health facilities having lower OOP than all other facilities for inpatient care.

Table 6: Out-of-pocket health expenditures, given utilization

Variables	Outpatient care			Inpatient care		
	Coeff.	S.E.	P> t	Coeff.	S.E.	P> t
Quintile 2	0.272	0.068	0.000	0.696	0.252	0.006
Quintile 3	0.532	0.070	0.000	0.896	0.248	0.000
Quintile 4	0.708	0.072	0.000	1.075	0.255	0.000
Quintile 5	1.302	0.077	0.000	1.852	0.256	0.000
Male	0.076	0.043	0.077	0.199	0.153	0.194
Chronic health condition	0.246	0.062	0.000	-----		
Private health insurance	0.220	0.165	0.182	-0.313	1.022	0.760
Public health insurance (NHIF)		NA		-0.321	0.276	0.245
Age < 5	-0.300	0.052	0.000	-0.416	0.186	0.026
Age > 65	0.250	0.099	0.012	0.591	0.335	0.079
Education (head)	-0.089	0.051	0.080	-----		
Urban		-----		-----		
Central	-0.654	0.100	0.000	-----		
Coast	-0.474	0.102	0.000	-0.544	0.235	0.021
Eastern	-0.453	0.101	0.000	-----		
North Eastern	0.428	0.152	0.005	-----		
Nyanza	-0.462	0.096	0.000	-0.312	0.184	0.090
Rift Valley	-0.366	0.097	0.000	-----		
Western	-0.636	0.101	0.000	-0.834	0.230	0.000
Public health facility		-----		-0.438	0.220	0.047
Private health facility	0.357	0.044	0.000	0.356	0.273	0.193
Constant	4.813	0.106	0.000	7.361	0.300	0.000
Number of observations			3041			410
F value			40.61			8.78
Prob > F value			0.000			0.000
R-squared			0.212			0.237

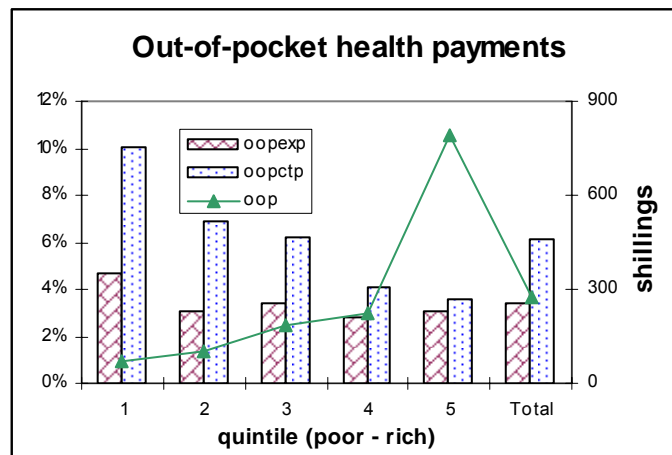
NA: not applicable

-----: not statistically significant at 0.2 level.

X.1. 4.5 Catastrophic household expenditure on health

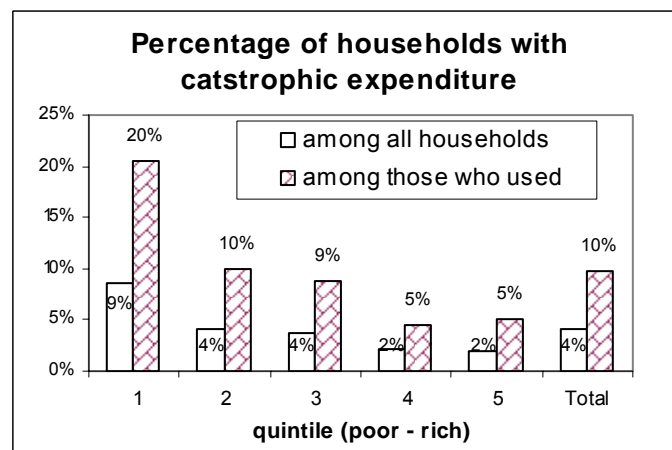
The average household out-of-pocket payment on health is 274 shillings per month (about 3.6 USD). This amounts to 3.4 % of average household monthly expenditure and 6.2% of household capacity to pay (non-subsistence spending). In absolute terms, out-of-pocket health payments varied dramatically across income groups. The average household out-of-pocket payment is only 73 shillings for the poorest quintile, but 790 shillings for the richest quintile (Figure 3). The proportion of total household expenditure (OOPEXP) is higher in the poorest quintile which is 4.7%. It does not vary much among other income groups. Considering out-of-pocket payments as a proportion of household's capacity to pay (OOPCTP), the richest two quintiles paid much less than the lower income groups. The percentage for the poorest quintile is 10% and for the richest quintile is only 3.6%.

Figure 3



The proportion of households with catastrophic expenditure is 4% among all households and 10% among those whose member had used health services. Figure 4 presents the percentages of households with catastrophic expenditure across quintiles. Catastrophic expenditure occurs in all income groups with the lower income groups have a higher proportion of households with catastrophic expenditure than the higher income groups. The poorest quintile has the highest proportion of households with catastrophic expenditure which is 9% among all households and 20% of those whose member had used health services.

Figure 4



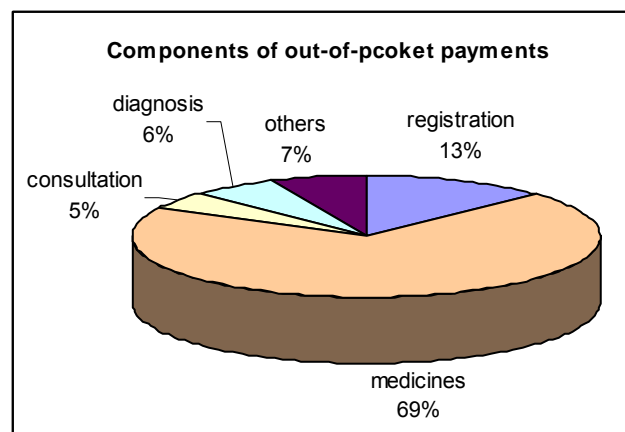
The survey also suggests that catastrophic expenditure due to paying for outpatient services alone is 2.72% of all households while it is 0.54% for inpatient services alone (Table 6). This result reflects a higher probability in the use of outpatient services than inpatient services. However, even only considering the households whose members had used the services catastrophic expenditure due to out patient services is not rare. It occurs in all income group but mostly in the lower income groups.

Table 6 Incidence of catastrophic expenditure in households due to outpatient and inpatient services

Quintile	among all households		among those who used	
	outpatient	inpatient	outpatient	Inpatient
1	5.58	0.54	12.65	10.06
2	2.71	0.46	5.54	5.59
3	2.95	0.41	5.73	3.41
4	1.33	0.39	2.84	4.5
5	1.03	0.91	2.36	9.1
Total	2.72	0.54	5.79	6.14

Information collected in the survey allows to estimate the components of out-of-pocket payments for outpatient services. Results in Figure 5 show that the spending on medicines is the largest share which represents 69% of total out-of-pocket payments for outpatient services. It is followed by the payments for registration and consultation. The structure of the out-of-pocket payment does not have substantial difference across income groups.

Figure 5



Logistic regression was applied to all households in exploring determinants of catastrophic expenditure. The dependent variable is defined as 1 when a household occurred catastrophic expenditure and 0 otherwise. Results show that a wide range of indicators are associated with catastrophic expenditure. The regression results are presented in Table 7.

Among the 8 provinces in Kenya, there is no significant difference in catastrophic expenditure among Nairobi, Nyanza, Rift Valley and Western at the 20% significance level. These four provinces are therefore regarded as the base category. Central and Coast have a lower proportion of households with catastrophic expenditure while Eastern and North Eastern have a higher proportion of catastrophic expenditure compared to the rest four provinces. Income is tested by quintile dummies. Compared to the first quintile, all the other income groups have a negative coefficient which indicates that the higher income groups have a lower proportion of households with catastrophic expenditure, as expected.

Households whose members used health facilities are more likely to face catastrophic expenditure than those whose members chose mission facilities, self-treatment and did

not use any services. Surprisingly among the four variables on utilization, the use of inpatient services in public facilities has the largest positive coefficient. It is followed by the inpatient services in private facilities. As expected outpatient services have a relatively smaller impact on catastrophic expenditure compared to inpatient services and the difference between using public and private facilities is very small. Households with members reporting illness have a greater likelihood to face catastrophic expenditure. Located in an urban area, having household members aged under 5, a household head with high education and currently working decreased the odds of catastrophic expenditure.

Controlling for all the above mentioned variables, health insurance status does not appear to be significant at the level of 20%. A number of explanations exist. First, the insurance, NHIF and other forms of prepayment schemes, covers only a very small proportion of the households (population). Second, the insurance, particularly the NHIF basically only covers the hotel costs related to inpatient stays; therefore a substantial part of inpatient costs as well as outpatient services remains to be paid out-of-pocket. Third, the insured are mostly located in higher income groups. Combining all these factors, it is not surprising that the current insurance has no effect on protecting households from catastrophic expenditure although it plays certain role in reducing some households' financial burden.

Marginal effects are also provided in Table 7. The marginal effect measures the change in probability of catastrophic with one unit change in a given independent variable, holding all the other variables constant. Results suggest that apart from health service utilization other socio-economic indicators also play an important role. For example, compared to a household in the poorest quintile, the probability of a household facing catastrophic expenditure in the second quintile is 1% lower. Similarly, the probability of facing catastrophic expenditure for a household located in North Eastern province is 1.33% higher than those located in the other four regions.

Table 7 Logistic regression of catastrophic expenditure
(1, with catastrophic expenditure 0, without)

variables	Coef.	OR	Std. Err.	z	P>z	marginal effect
Province						
Central	-0.34	0.71	0.26	-1.33	0.18	-0.49%
Coast	-0.40	0.67	0.31	-1.28	0.20	-0.55%
Eastern	0.33	1.39	0.19	1.75	0.08	0.59%
North eastern	0.65	1.91	0.30	2.14	0.03	1.42%
Income						
2nd quintile	-0.76	0.47	0.19	-4.05	0.00	-1.00%
3rd quintile	-0.83	0.44	0.23	-3.62	0.00	-1.07%
4th quintile	-1.16	0.31	0.28	-4.07	0.00	-1.39%
5th quintile	-0.92	0.40	0.27	-3.42	0.00	-1.16%
Utilization						
outpatient service (public)	1.20	3.31	0.17	7.17	0.00	2.91%
outpatient service (private)	1.19	3.27	0.17	6.81	0.00	3.02%
inpatient service (public)	1.74	5.69	0.26	6.71	0.00	6.55%
inpatient service (private)	1.22	3.39	0.49	2.50	0.01	3.65%
Illness						
with members reported illness	1.27	3.56	0.23	5.46	0.00	2.08%
Other variables						
urban	-0.98	0.37	0.31	-3.16	0.00	-1.33%
currently working	-0.35	0.71	0.16	-2.20	0.03	-0.59%
secondary school & above	-0.71	0.49	0.26	-2.78	0.01	-1.02%
With members under 5 yrs covered by insurance	-0.26	0.77	0.15	-1.68	0.09	-0.41%
cons	0.04	1.04	0.32	0.14	0.89	0.07%
	-3.65		0.25	-14.88	0.00	

Number of obs = 8407

Wald chi2(18) = 385.10

Prob > chi2 = 0.000

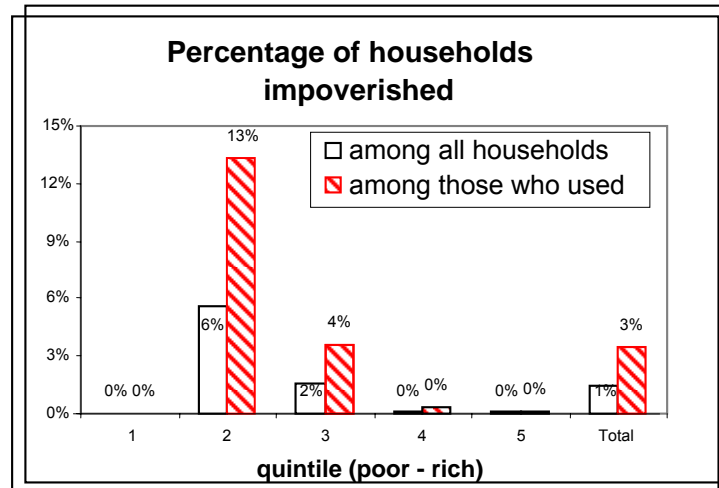
Log pseudo-likelihood = -

1147.3624

XI.1. 4.6 Poverty impact

Out-of-pocket payments lead to financial difficulties for some households, and push some others into poverty. 3.5% of the households who used health services were impoverished which translated into 1.5% among all households in the country. Impoverishment was experienced mostly in the second quintile and some in the third quintile. No households are impoverished in the poorest quintile because they were already under the poverty line before health payments (Figure 6).

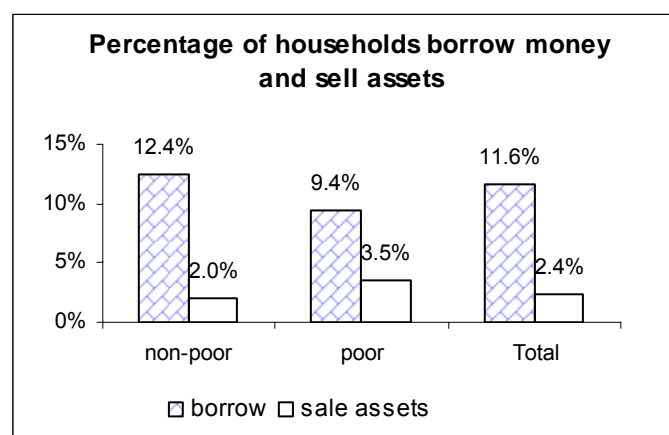
Figure 6



For those who are under the poverty line, out-of-pocket payments enlarge the poverty gap. Before out-of-pocket payments the poverty gap is 333 shillings per month while after health payments it becomes 361 shillings per month. The poverty gap is enlarged by 28 shillings per month because of paying for health services. This means that in order to lift all the households under the poverty line 28 shillings more per month (or 336 shillings per year) are needed from each household due to health payments.

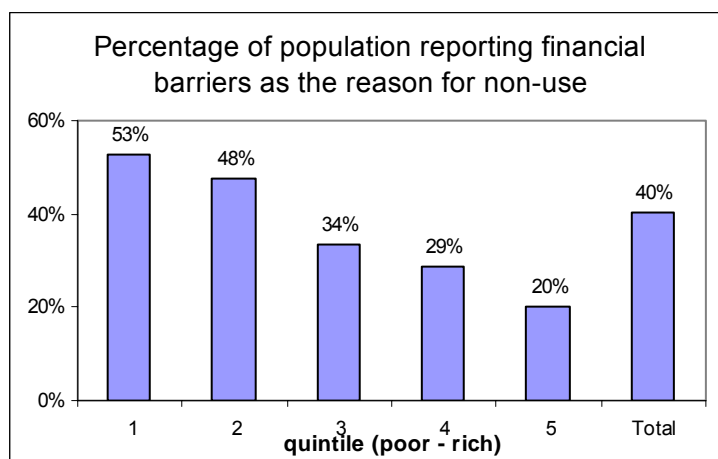
The survey also asked the financial sources for paying for health services. 11.6% of households had to borrow money and 2.4% of households had to sell their assets in order to cope with the medical bill for sick family members (Figure 7). The non-poor have more capacity to borrow money than the poor while the poor relies more on sale of assets. Borrowing money and sale of assets can result in a household reduce its other basic expenses for a long time.

Figure 7



For those who used outpatient services, about 50% went to public facilities and 39% to private facilities. For inpatient services 70% of the patients used public facilities and 17% used private facilities. There is no substantial difference between the poor and the non-poor in choosing different providers. For those who did not use any service, 40% are due to financial reasons. Among the poorest two quintiles financial barriers accounted for about 50%. Financial barriers become less important as income increases (Figure 8).

Figure 8.



5) Key lessons for current and future health financing reforms

The main challenge will be for the new NSHIF to effectively improve financial protection of households. The empirical results showed that of those households who could not access health care, 40.5% cited financial difficulties as the principal reason; among the poor and non-poor, this percentage was 51.9% and 32.8%, respectively. Furthermore, the high out-of-pocket health care expenditure led 4.1% of households to face catastrophic expenditure; this percentage for the poor and non-poor was 7.7% and 2.7%, respectively. Finally, it is estimated that health care payments push 1.5% of households into poverty which translates into more than a hundred thousand households and about 480 thousand individuals.

The results in this paper also remind health financing policy-makers about a number of specific challenges related to health insurance membership and access to health care. *First*, it was seen that there are differences in NHIF membership according to the residence of potential members (favouring membership in urban areas as opposed to rural areas, and differences according to province). Similarly, a geographical bias was noted when studying the determinants of utilization given need, with Nairobi citizens having greater access. These are important pitfalls to avoid in the new NSHI system. The insured should thus be able to register wherever their residence is, and should find a response to their health care needs.

Secondly, utilization of health care was found to be linked to income, with the rich having greater access than the poor. The new NSHIF can rectify this, by providing citizens with equal rights to a basic health care package, whatever their income or social status may be. It is crucial that this health care package is comprehensive, since the earlier regression results demonstrated that the current NHIF only has a limited impact on improving access to care. In this respect, it will be important that sufficient financial resources are allocated to paying for the membership of those who cannot afford the social health insurance contributions. It is expected that the Ministry of Finance would transfer the necessary amount to the NSHI Fund.

Thirdly, those aged over 60 and patients with chronic diseases were found to have less access to care than other patients. Clearly, the new NSHIF would need to respond to this problem and define a benefit package of health services that recognizes health

care needs of those categories of patients. The issues related to membership and access to care raised above help to understand why the NHIF did not have a significant effect on health care access. It is expected that the NSHIF will address these issues, so that that it can overturn the earlier finding and exert an overall positive effect on access.

Policy-makers should also be reminded about the size and the effect of out-of-pocket payments and their impact on impoverishment. *First*, as was the case with access to care, there are geographical differences in OOP, given health care use, with North Eastern province facing the highest out-of-pocket spending and citizens in provinces outside Nairobi having lower or equivalent OOP. Not only will the NSHIF need to establish an adequate benefit package of health services, the level of provider payment for these services also needs to be clearly defined. Furthermore, if co-payments prove to be essential for the purposes of financial feasibility of the new scheme, a nationwide co-payment schedule has to be established. Only then will patients, given the illnesses they have and their subsequent needs for health care, face the same OOP.

Secondly, it was found that the NHIF did not have a significant downward effect on catastrophic expenditure. One of the indicators of good performance of the new NSHIF will be the degree with which catastrophic expenditure can be avoided. This is an important signal for those who are involved in establishing provider payment and co-payment levels. A balance will need to be found between prepayment via social health insurance contributions and co-payment at the point of use of care. This balance ought to take account of the policy objective to avoid catastrophic out-of-pocket payments among households.

Thirdly, avoiding impoverishment is another policy objective of the new NSHIF. The latter emphasizes once more the need for a schedule of provider payments and co-payments that is apt to provide the necessary financial protection. In this respect, the exemption of vulnerable population groups from paying co-payments for insured health services may need to be considered.

6) Conclusion

The Kenyan health financing reform, namely the implementation of a national social health insurance scheme, represents a major challenge. This is a reform in a series of health financing policy changes since Kenya's independence, from a fully fledged tax-based system to the introduction of user fees, the temporary withdrawal of user fees, the reintroduction of user fees and then finally the social health insurance reform. Expectations regarding the current reform are high, given that there are many problems of access to care that need to be dealt with.

From the various empirical results presented in this paper, we can learn, first, how important it is for a health insurance scheme to adequately define membership and then ensure that the eligible population is effectively financially protected. In the present reform, it is intended for all of the population to become a member of the new social health insurance scheme. As the scheme needs to strive for nation-wide membership, steady progress in membership registration of the formal sector workers, the self-employed and informal sector workers as well as their families will need to be carefully managed. Secondly, considerable attention is to be paid to the design of the

benefit package of health services, and of the provider payment and co-payment schedule for these services. The benefit package will need to take account of important and unmet needs by specific population groups. Furthermore, the provider and co-payment schedule needs to be defined in such a way that citizens receive financial protection against the cost of illness of its members, thereby avoiding catastrophic spending and impoverishment.

Finally, a similar quantitative study could be undertaken after one or two years of operation of the new NHIS in order to measure performance and make comparisons with that of the previous health financing system.

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