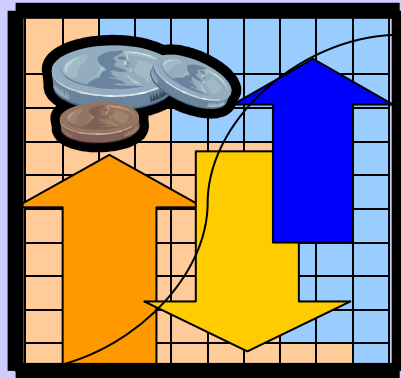




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**The Impact of Universal Insurance
Program on Catastrophic Health
Expenditure:
Simulation Analysis for Kenya**

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**The Impact of Universal Insurance Program on
Catastrophic Health Expenditure:
Simulation Analysis for Kenya**

By

Priyanka Saksena, Ke Xu and Guy Carrin



**World Health
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Summary

The current definition of the incidence of catastrophic health expenditure is extremely constrained in its capacity to understand the true burden of out-of-pocket health expenditures. This paper develops a broader framework of catastrophic health expenditure to provide a more complete picture of its potential incidence. The practical implications of using this broader framework are then illustrated through modeling the effect of implementing a simple and affordable universal health insurance program in Kenya. The analysis shows that universal health insurance has a significant impact on changing the utilization of health services as well as on household health expenditures. It also demonstrates the benefits of using the broader framework of catastrophic health expenditure in assessing health financing systems. Further consideration and development of this broader framework is warranted.

Introduction

Out-of-pocket health payments (OOP) are a substantial burden of as well as barrier to accessing healthcare. OOP can lead to households facing catastrophic health expenditure and impoverishment. Pre-payment mechanisms are a valid tool to protect households against the burden from OOP. Additionally, the incidence of catastrophic health expenditure in a population is a valid indicator of the magnitude of the problem of out-of-pocket health expenditures. As a result, an analysis of catastrophic health expenditure is an interesting platform for analyzing health financing options. In this paper, the role of a particular pre-payment mechanism, universal health insurance, will be studied through expanding the definition of catastrophic health expenditure as well as the development of behavioural models. Data from Kenya will then be used to illustrate the results of the model.

A previous multi-country analysis found that the percentage of households with catastrophic health expenditure, when it is defined as out-of-pocket health expenditure (including routine health expenditures) representing 40% or more of total non-subsistence expenditure, varied from less than 0.01% to 10.5% across the countries in the study. The study also found that countries with "advanced social institutions such as social insurance or tax-funded health systems protect households from catastrophic spending" (Xu *et al.*, 2003).

Analysis of the Household Health Expenditure and Utilisation Survey, 2003 of the Ministry of Health of Kenya (Ministry of Health, 2003) shows that there is marked difference in utilization of health services across different income groups. Lower income groups are also more likely to face catastrophic health expenditure. The number of households facing catastrophic health expenditure at the 2003 utilization levels is estimated to be around 4%. Additionally, lower income households are more likely to fall under the poverty line due to health expenditures than higher income households. Overall, 1.5% of Kenyan households are estimated to be impoverished due to health expenditures (Xu *et al.*, 2006b).

From data such as this, it becomes clear that health expenditures and health expenditures relative to household income play an essential role in the utilization of health care services. However the number of households exposed to the risk of catastrophic health expenditure is bound to be under-reported in these and other studies. The majority of previous research on catastrophic expenditure has only taken into account expenditures of households who have used health services (Ranson, 2002, Su *et al.*, 2006, Xu *et al.*, 2006, Waters *et al.*, 2004). This represents only households with observed catastrophic health expenditure. A study based on Indonesian data took into account the potential incidence of catastrophic health expenditure and effects of social risk management (Pradhan & Prescott, 2002). This study shows that there is a gap between the observed and the potential catastrophic expenditure. Undoubtedly, there are many households who are too poor to afford the out-of-pocket payments for

health care and hence, are not able to use health services. By not including these households into the calculation of catastrophic of health expenditure, its true burden across the population is being underestimated, and especially its burden for poorer households. In addition, whereas measuring the actual incidence of catastrophic expenditure is useful for some things, an approach that takes into account its total potential incidence is more useful when the effects of implementing a specific pre-payment program are considered.

In the context of Kenya, this study will estimate the total potential burden from catastrophic health expenditure by taking into account households who would have faced catastrophic health expenditure had they chosen to seek health care when they needed it (using self-reported need for health care as a proxy for need). It will then analyze the potential role of a simple insurance program on health services utilization, the price of health services and total catastrophic health expenditure. The use of Kenyan data is particularly interesting because of the discussion around expanding the current National Hospital Insurance Fund (NHIF) (IPAR, 2005, (Kimani et al., 2004). Overall, this research aims to develop methodological tools that can be used to understand the total burden from catastrophic health expenditure and the effects of implementing pre-payment systems. The use of Kenyan data also provides an interesting basis for comparison with other countries that may be considering similar reforms.

This paper is divided into four sections including the "Introduction". The "Methodology" section will then go to discuss the development of the models used in this paper in detail. The results will be presented in the "Results" section and discussed along with the further particularities of the methodology in the final section, "Discussion".

Methodology

The data used for this study is from Household Health Expenditure and Utilisation Survey, 2003 of the Ministry of Health of Kenya (Ministry of Health, 2003). The data was collected by asking one member of each of the surveyed households to answer questions about their household's socio-economic conditions, health and health-related expenditures.

A key idea in this paper is the treatment of the incidence of catastrophic health expenditure. As discussed earlier, the analysis of catastrophic health expenditure has so far mainly concentrated on its observed incidence. This is not indicative of the real scale of the problem of catastrophic health expenditure. The decision to use health services is bound to be influenced by the expected financial burden that would be imposed by it. By considering only the observed incidence of catastrophic health expenditure, we are effectively ignoring all the people who have refrained from using health services because the expected financial burden of use was too large. In addition, when assessing the effects of a pre-payment program such as universal insurance, as is done in this paper, it is useful to look at total potential catastrophic health expenditure. In this paper, expected out-of-pocket expenditures for those who were unable to use services despite their need were calculated. These expected out-of-pocket expenditures were then combined with observed out-of-pocket health expenditures for people who actually used services to arrive at the total potential incidence of catastrophic health expenditure.

In terms of the actual data used, reported out-of-pocket expenditures included expenses related to health service use but excluded transportation costs and routine health expenditures (e.g. on vitamins, etc.). In this manner, informal payments at health facilities are likely to have been included in the reported in the out-of-pocket expenditures. Out-of-pocket expenditures were predicted by using a Heckman-adjusted model with combined elements of general health status, economic and demographic criteria (separately for outpatient and inpatient services). In this fashion, predicted out-of-pocket

expenditures of non-users who reported the need to use services were derived. A log-linear regression model was used because of the skewed nature of the original data. A smear or normal retransformation was used to derive the predicted out-of-pocket depending on the original distribution. OOP was predicted through the following model (where the function f was linear):

$$\log(oop) = f(x) + error \quad (1)$$

Where x is a vector of age5, age65, urban, male, hh_educ, chro, ins, employed, q2, q3, q4, q5. The variables are defined in Table 1.

For the observed catastrophic health expenditure, only the reported out-of-pocket expenditures incurred by those who utilized services need to be used. However, for calculating the total potential (unobserved and observed) incidence of catastrophic health expenditure, the reported out-of-pocket expenditures for those who utilized health services were combined with the predicted out-of-pocket expenditures (from Equation 1) for those who did not use health services but reported the need to. This paper's definition of catastrophic health expenditure methodology is based on the "fair financing" framework (Xu, 2005, Murray & Evans, 2003). The methodology defines the incidence of catastrophic health expenditure when OOP payment exceeds 40% of household non-subsistence (non-food) expenditure.

The effect of a simple universal insurance program was then considered. A prepaid mechanism led to percentage decreases in the out-of-pocket payments associated with outpatient and inpatient utilization. We assumed that the mechanism covers a percent γ of out-of-pocket payments for both inpatient and outpatient utilization for everyone. In this particular case, we defined γ as 50%. This was irrespective of the choice of health care provider and there were no caps on sums covered. All households except those in the first two expenditure quintiles contributed to the proposed health insurance program. Households employed in the formal sector paid 3.5% of their income and households in the informal sector paid KSh 40 per person per month. The decreases in income corresponded directly into decreases in the non-subsistence expenditure (i.e. a 3.5% decrease in income corresponded to a 3.5% decrease in non-subsistence expenditure). It should be noted that this did not have any significant effect on the changing the distribution of household incomes.

The second model developed tries to understand the role of the predicted out-of-pocket expenditures, in addition to some individual demographic and general health status variables, on the use of services. It is also pivotal in understanding how much overall use of health services will increase as a result of the percent γ decrease in OOP. The predicted out-of-pocket expenditures from the first part were used as an explanatory variable for use of health services by dividing them by the per capita non-subsistence expenditure. This was done since seeking health care is thought to be influenced by the expected financial burden imposed by it, which can be approximated by the ratio of predicted out-of-pocket service costs over the per capita non-subsistence expenditure. Indeed, if the expected financial burden was high, then health services may not be used despite their perceived need.

The precise specification of the utilization model was through a logistic regression model and included the ratio of predicted prices over per capita non-subsistence expenditure combined with certain demographic and general health status variables (vector y). Vector y included the following components: age5, age65, male, hh_educ, chro, ins, employed, q2, q3, q4, q5, financial_burden. Where financial_burden is defined as OOP/per-capita non-subsistence expenditure (predicted OOP for non-users and actual OOP for users).

$$use = logistic(y) + error \quad (2)$$

It should be noted that Durbin-Wu-Hausman test was used to verify if ins (which represents subscription to insurance other than the proposed universal plan) was endogenous in the utilization equation but this was not the case.

Using this model, the sensitivity of utilization to changes in the financial burden was estimated. It was then possible to estimate the overall population level change in utilization given a change in financial_burden. This overall population level change in utilization after the implementation of health insurance (i.e. a 50% decrease in out-of-pocket expenditures and a decrease in non-subsistence expenditure according to each household's contribution criteria) was calculated as use_change_pop.

At this point, it is also important to reconsider the limitations of the models used until this stage. By its very nature, the health services utilization model derived in the preceding section only provides information regarding the average population-wide change in use if parameters such as financial_burden change. Indeed, the predictive power of the model for individuals' use is not be valid and a more complicated model needs to be developed in order to predict individual level changes in utilization.

In the model developed to address this, it was assumed that everyone valued the additional opportunity cost of the financial burden imposed by using health services in the same way. In other words, the model equalized the financial burden based-*marginal disutility* of the use of health services for all people who reported the need to use services. This assumption could very realistically represent the changes in use of health services if out-of-pocket payments are uniformly decreased for all individuals (since marginal disutility can be expected to be affected by the new financial_burden). In order to make this model even more valid, the sum of the non-subsistence expenditure (the denominator in the equation below) was calculated using the household weights provided in the survey. The mathematical representation of this model is:

$$\alpha = \frac{\sum_{i=1}^n (OOP_i - \lambda * (OOP_i) * use_change_pop / n)}{\sum_{i=1}^n nse_i} \text{ where } (i \in n) \quad (3)$$

In the equation above, "n" is total number of people who report the need to use health services and each individual who needs services is represented by "i". OOP_i is the original predicted out-of-pocket payment for an individual. nse_i is an individual's non-subsistence expenditure. Finally, use_change_pop represents the overall population wide change in use with the new out-of-pocket expenditures. In this fashion, α is the equalization constant of the marginal disutility derived from utilization across all individuals because of implementation of the prepayment program.

The equalization constant can then used to predict changes in an individual's health expenditures. The new individual expected total out-of-pocket expenditure then becomes:

$$new_oop_i = price_i - \lambda(price_i) + \alpha * nse_i \quad (4)$$

In Equation 4, " $\alpha * nse_i$ " is the marginal change in health expenditure due to changes in an individual's use of health services. The first part, $OOP_i - \gamma(OOP_i)$, simply models the decrease in an individual's health expenditures if his utilization did not change (in this particular case γ is defined as 50%). The second is the marginal increase in expenditure as a result of the decreased OOP (through an increase in the use of health services). Therefore, the addition of these two parts represents an individual's new

total health expenditure.

It should be noted that for individuals who had actually used health services, OOP was substituted with their actual out-of-pocket payment. The new_oop_i of both outpatient and inpatient services of the all individuals in a household who had reported the need to use health services was then added. The total household out-of-pocket expenditure was then divided by the household's non-subsistence expenditure to calculate the total (both observed and unobserved) number of households in the survey population facing catastrophic expenditure.

$$hfc_j = \frac{\sum_{i=1}^{hsize_j} new_oop_i}{nsehh_j} \quad (5)$$

(For all individuals "i" with need who are part of a household "j" ($i \in j$) and where $nsehh_j$ is a household's non-subsistence expenditure.

The incidence of catastrophic health expenditure takes into account the household weights provided in the survey and is defined as (for out-of-pocket expenditure new_oop and non-subsistence expenditure $nsehh$):

$$\begin{aligned} catas_j &= 1 \text{ if } hfc_j \geq 0.4 \text{ or} \\ catas_j &= 0 \text{ if } hfc_j < 0.4 \end{aligned} \quad (6)$$

In this fashion, the effect of the proposed health insurance program on the total potential incidence of catastrophic health expenditure was demonstrated.

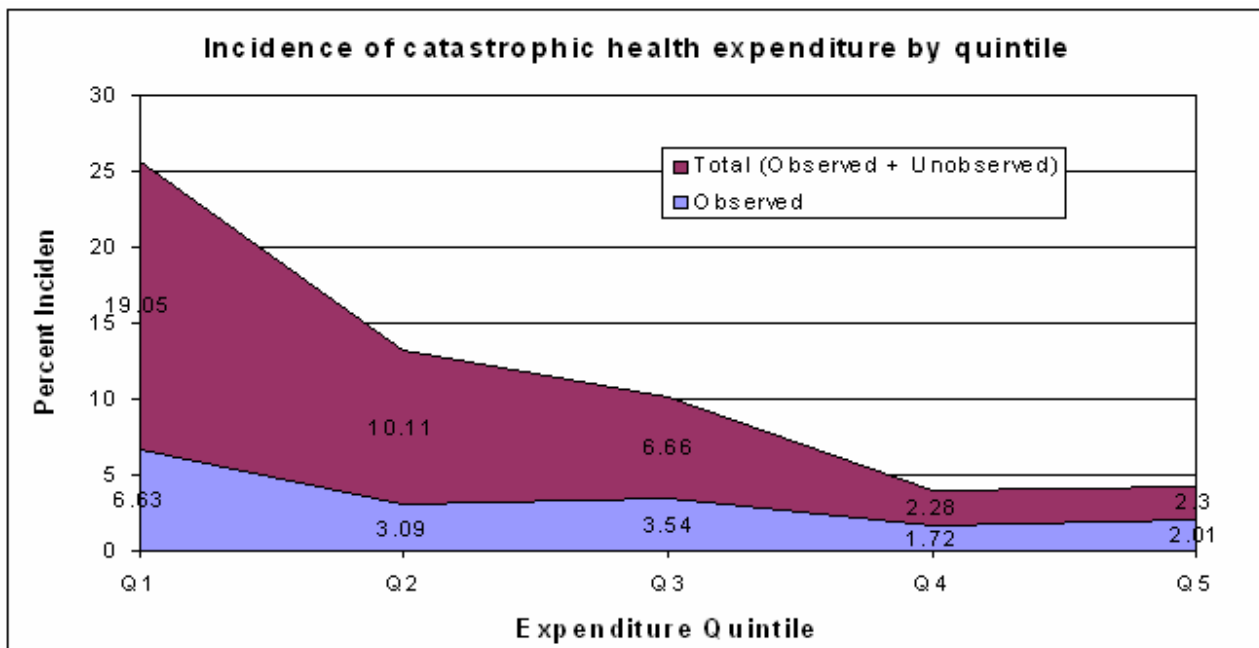
All data used in this study was in the public domain and hence ethical clearance was not sought.

Results

The results of the intermediate models as well as the specific pre-payment scenario on catastrophic expenditure will be presented in this section. A summary of the variables used in these models is presented in Table 2.

The calculation of total potential catastrophic health expenditure compared to observed catastrophic health expenditure (before the implementation of the health insurance program) across expenditure quintiles is shown in Figure 1. This provides basis of comparison for the effects of implementing the discussed pre-payment program as well as illustrate the differences in the two definitions of catastrophic health expenditure.

Figure 1 – Incidence of catastrophic health expenditure



With current out-of-pocket expenditure, more than 6.6% of households in the first quintile had observed catastrophic health expenditures. In comparison, only around 2% of households in two highest quintiles had observed catastrophic health expenditures.

However, there is a significant difference between the total number of households potentially facing catastrophic expenditure and the households who actually faced catastrophic expenditure. This is, of course, partially due to the fact that poorer households who initially did not use services because they could not afford to are now assumed to be using services (since everyone who reported the need to use health services is assumed to have used them in the calculation of total potential catastrophic health expenditure). This is further demonstrated in the following: only an additional 0.29% of households in quintile 5 who did not initially use services now risk catastrophic expenditure whereas an additional 12.42% of households in quintile 1 who did not initially use services now risk catastrophic expenditure. The usefulness of the expanded definition of the incidence of catastrophic health expenditure will be further demonstrated in the proceeding sections, which show the results of using this expanded framework in the context of assessing the a particular health insurance program.

The first component of the health insurance models predicts OOP expenditure for people reported the need to use health services but did not use them. There are many interesting features of the results from these Heckman-adjusted regression models, which are shown in Table 3 and 4. In the outpatient regression, it is interesting to note that only a three factors seem to distinguish people who used services from those who did not when they were in need. The variable *hh_educ*, which indicates whether or not the household head is educated, is a significant predictor of the use of outpatient services. This is very much in line with various education and health care paradigms. As would be expected, this variable has a positive association with use. The other two significant predictors of use are expenditure quintiles q4 and q5. Once again, as would be expected, people in higher expenditure quintiles are more likely to use services. In terms of the predictors of out-of-pocket payment for outpatient services, *age5* is a strongly significant with a negative relationship. This is likely to be a result of the subsidisation of services of children under 5 (technically, services for children under 5 are

free in Kenya). Similarly, the variable male has a strong negative relationship with OOP. This is likely to be a result of the subsidization of pregnancy related services for women. Another significant parameter is urban, the variable identifying people living in urban areas. The existence of subsidized outpatient facilities in urban areas could explain this phenomenon. Additionally, there is a clear and consistent positive relationship between out-of-pocket payments and household expenditure variables q2, q3, q4 and q5. This strongly suggests that richer households pay higher out-of-pocket payments.

There are fewer significant predictors of inpatient services OOP and use in the dataset. Perhaps the most interesting difference between the people who use inpatient services and those who don't is their employment status, which is denoted by the variable employed. There is a negative relationship between employment and the utilization of inpatient services use. Conventionally, it is difficult to distinguish whether this relationship arises because the unemployed are too sick to work or whether the employed choose not to access care because they don't want to lose any income while they are in the hospital. In this dataset, there is no relationship between chronic illness, reported need to use health services and employment status. This seems to indicate that this relationship arises because the employed do not want to forgo the income they would earn if they are hospitalized. Indeed, this has many important ramifications. The second significant distinguishing variable between users and non-users of inpatient services is subscription to insurance services, which is denoted by ins. As would be expected, people with insurance are more likely to use health services. This is a classic indicator of the problem of moral hazard. It should also be noted that the lack of widely available outpatient insurance schemes may explain the absence of insurance as a predictor in the use of outpatient services. Once again, urban has a negative relationship with out-of-pocket payments which could be explained through the existence of subsidized inpatient facilities in urban centres. Although this may be valid, it should also be noted that there seems to have been an over-reporting of the need for inpatient services in urban areas.

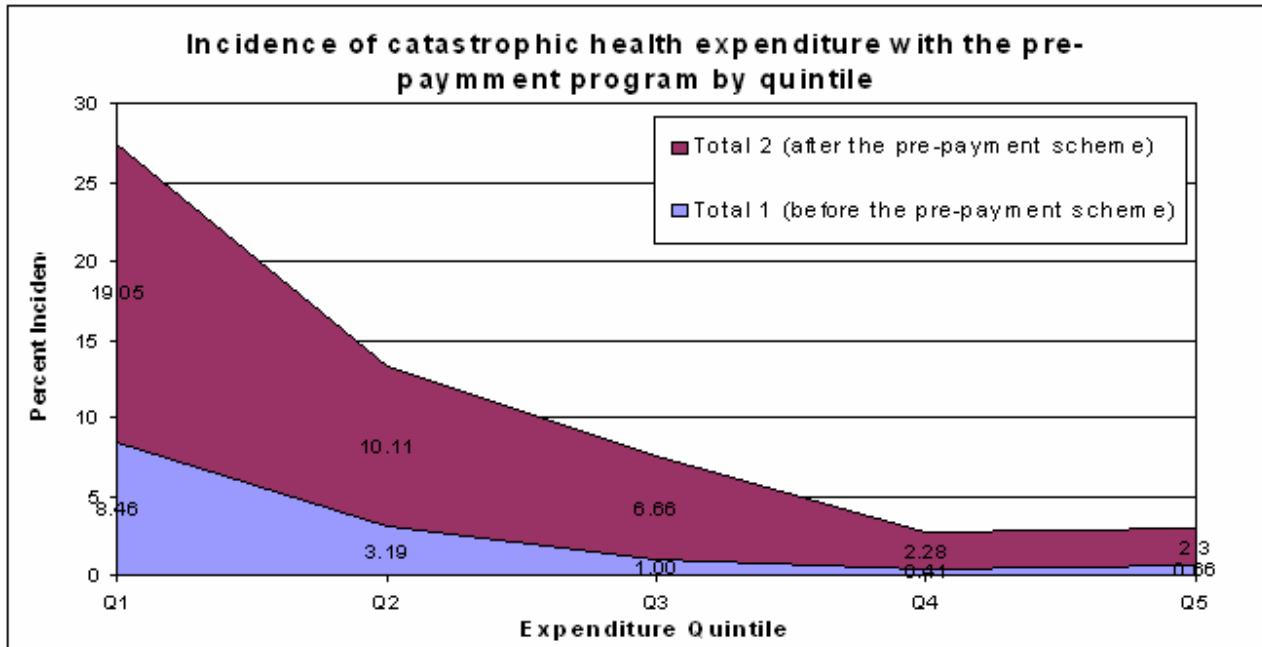
The results from these regressions were then used to predict the out-of-pocket payments associated with all people who reported the need for either outpatient or inpatient services. The relevance of these predicted out-of-pocket expenditures on the decision to use or not to use health services was then modelled through dividing them by the non-subsistence expenditure. The results of the logistic regression models to predict health services utilization are shown in Table 5 and 6.

The variables, financial_burden_o and financial_burden_i, which represent the financial burden on an individual if he chooses to seek health care in outpatient or inpatient facilities respectively, have very significant predictive power in both the models. Additionally, as could have been expected the relationship between the size of this financial burden and utilization of health services is negative. The other variables in the logistic utilization models are consistent with the significant variable in the Heckman-selection equations. The absence of expenditure quintiles in the outpatient services utilization model is logical since the financial burden associated with seeking care is related to this.

The intermediate models were then used to analyze the effect decreasing out-of-pocket expenditures by 50% (with no caps) and with the aforementioned decrease in non-subsistence expenditure on the incidence of catastrophic health expenditures. With the implementation of the proposed pre-payment program, there would a 3.06% and 3.99% marginal increase in the use of outpatient and inpatient services respectively (due to the decreased financial burden associated with seeking care). The marginal cost of the program (which represents the difference in revenue collected from out-of-pocket expenditures if everyone who needs services uses them with and without the proposed health insurance) is KSh 1,603,939 for the sample size of 38,000 people for one month (the cost of the program is covered by the proposed contributions). The overall incidence of total potential catastrophic health expenditure will decrease to 2.75% under this scenario. Figure 2 separates this incidence across

expenditure quintiles.

Figure 2 – Incidence of catastrophic health expenditure with the pre-payment program



In addition to the increase in utilization, the implementation of universal health insurance leads to significant decreases in the incidence of total potential catastrophic health expenditure. In addition, the decrease is higher for lower quintiles than for higher quintiles in absolute terms. The incidence in the first expenditure quintile decreases from 19.05% to just 8.46%. Similarly, the incidence in second expenditure quintile decreased from 10.11% to just 3.19%. In comparison, the incidence in the highest expenditure quintile decreased from 2.30% to 0.66%. This means that a higher number of lower expenditure households are benefiting from the implementation of health insurance than higher expenditure households.

Discussion

This study contributes to advancing the methodology of measuring potential catastrophic expenditure and applies it to estimate the impact of a universal insurance program. However, caution needs to be applied in interpreting its results. Indeed, there are many factors related to the accuracy and reliability of the models that need to be underlined. One of the important issues is the availability and quality of the data. The survey data needs to be subject to the usual degree of scrutiny, taking into account the occurrence of both systematic and non-systematic errors. As was mentioned earlier, there are certain indications about data quality such as the over-reporting of the need to use health services among urban dwellers. Whereas this particular incident was identified and acknowledged, it is plausible that other more subtle biases in the data set have not been detected and thus their potential effects on the results have been not considered. Also, ideally, when modelling the out-of-pocket service costs and utilization, distinctions should be made between the types of provider (e.g. public, private-for-profit, etc.) since there are many differences among them both in terms of prices as well as the potential coverage for health insurance programs, which was not possible with the dataset used.

The variety of data gathered within the survey is also quite limited with respect to this exercise. There was no data available with regards to variables that would be pivotal for health-care seeking decisions such as the perceived seriousness of the condition, the loss of income that would be associated with seeking health-care and the perceived quality of health care providers. Therefore, in order to arrive at an even more holistic and reliable model, it should be recognized that additional data is needed.

Furthermore, the use of self-reported need in this context is not without its constraints. Indeed, the basic assumption in understanding the complete burden from catastrophic health expenditure in this dataset is completely dependant on the accuracy of this self-reported need. Undoubtedly, there is bound to be a certain degree of inaccuracy since self-reported need may not actually translate into real need.

It should be noted that some of the demographic and general health status variables used in predicting prices through the Heckman-adjusted regression model were also used in the utilization model. However, the separate and combined correlation of the significant variables was quite minimal, and therefore it was felt that they could still be used. Ideally of course, a completely different set of variables would have been used for the utilization model. Unfortunately this was not possible within this dataset.

Additionally, the universal insurance program proposed was very simplistic in nature. It did not take into account the practical difficulties of running the scheme, its effects on supply of services (and potentially OOP itself). It also did not take into account issues such as administrative costs and risk loading.

This study contributes to advancing the methodology of measuring potential catastrophic expenditure and applies it to estimate the impact of a pre-payment program. We only presented one scenario as an example in this paper. However, even these limited results highlight some very interesting points.

In terms of utilization, the results demonstrate a significant increase in the utilization of health services after the 50% decrease in out-of-pocket payments (a 3.06% and a 3.99% increase in the use of outpatient and inpatient services respectively). This result stresses the elastic nature of the relationship between out-of-pocket payments and the utilization of health services. It also serves to reinforce the finding that decreases in out-of-pocket expenditures have a positive impact on the utilization of health services (Burnham *et al.*, 2004, Collins *et al.*, 1996, Nabyonga *et al.*, 2005).

The factors that effect utilization of health services are also very interesting to note. Of particular interest is the negative relationship between the use of inpatient services and employment. Overlooking the earlier discussion around the causality of this relationship, this finding is a relevant justification for expanding the cover of insurance programs to include income loss. Indeed, the implication of a workforce failing to seek-care for serious illnesses is not something that should be ignored. Also of interest is the positive relationship between education of the household head and utilization of outpatient services. The prompt use of primary level health care facilities is undoubtedly a beneficial thing for population health status as well as health systems. It is encouraging to see more empirical evidence about the relationship between education and care seeking behaviour. Additionally, the other traditional relationship between insurance services and the of use health services was also visible in this dataset.

However, the key result demonstrates the expanded catastrophic health expenditure framework. It also illustrates the usefulness of the framework in assessing health financing options. Indeed, in this case, if the proposed insurance covers the whole population, the risk from or potential incidence of

catastrophic expenditure will be greatly decreased in lower expenditure quintiles. The percentage of families in the first expenditure quintile potentially facing catastrophic health expenditure decreased by 10.60% after the implementation of the pre-payment scheme as compared to just 1.64% of families in the fifth expenditure quintile. Considering the number of households facing catastrophic health expenditures in the lower quintiles to start off with, the decrease is extremely important and encouraging. In addition, it is important to note that the cost of the simulated scheme was just a small fraction of the self-reported income of the survey participants (even given the limitations mentioned earlier). The contributions required to finance this considerable scheme are also very affordable: the first two expenditure quintiles are exempt from contribution; the formal sector households (the taxed labour force) contribute at only 3.5% of their income; and the informal sector households contribute KSH 40 per member per month.

However, low expenditure quintiles are still facing a higher incidence of catastrophic expenditure than higher expenditure quintiles. Results from the simulated models show that the catastrophic expenditure in the poorest quintile is 8.46% compared to just 0.66% in the richest quintile. These results indicate that more effort may be needed in ensuring that lower income households are not faced with catastrophic health expenditure. In terms of a pre-payment program, differential subsidies for lower and higher income households (where lower income households' out-of-pocket is decreased more than higher income households) may be a way of achieving this.

There is a lot more work to be done in understanding the true burden of catastrophic health expenditure. More than anything, this paper is an attempt to encourage further research and development of the methodology presented here as well as other methodology targeted at advancing the work on catastrophic health expenditure as well as that on modelling the effects of changes in out-of-pocket expenditures.

Appendix (Tables)

Table 1. Variable Definitions

Variable name	Label
age5	1, less than 5 years old; 0, otherwise
age65	1, 65 or more years old; 0, otherwise
urban	1, urban; 0, rural
male	1, male; 0, female
hh_educ	1, household head educated; 0, otherwise
chro	1, with chronic illness; 0, otherwise
ins	1, currently covered by insurance (other than proposed universal insurance); 0, otherwise
employed	1, currently employed; 0, otherwise
q2	1, second expenditure quintile; 0, otherwise
q3	1, third expenditure quintile; 0, otherwise
q4	1, fourth expenditure quintile; 0, otherwise
q5	1, fifth expenditure quintile; 0, otherwise

Table 2. Variable Summary

Variable	Mean	Std. Dev.
age5	0.131	0.338
age65	0.033	0.179
urban	0.252	0.434
male	0.492	0.500
hh_educ	0.701	0.458
chro	0.059	0.235
ins	0.093	0.291
employed	0.258	0.438

Table 3. OOP Outpatient

	Coef.	Std. Err.	z	P> z 	[95% Conf. Interval]	
age5i	-0.564	0.106	-5.300	0.000	-0.772	-0.355
urban	-0.362	0.114	-3.170	0.001	-0.585	-0.138
male	0.312	0.090	3.470	0.001	0.136	0.489
q2	0.403	0.142	2.840	0.005	0.125	0.682
q3	0.759	0.144	5.270	0.000	0.477	1.042
q4	1.146	0.178	6.430	0.000	0.797	1.496
q5	1.428	0.202	7.070	0.000	1.032	1.824
constant	2.718	0.613	4.430	0.000	1.517	3.920
select						
yes_educ	0.239	0.036	6.730	0.000	0.169	0.309
q4	0.185	0.041	4.520	0.000	0.105	0.265
q5	0.230	0.042	5.420	0.000	0.147	0.313
cons	-0.206	0.031	-6.620	0.000	-0.266	-0.145
mills						
lambda	1.134	0.724	1.570	0.117	-0.285	2.553
rho		0.414				
sigma		2.742				
lambda	1.134	.724				

Number of obs = 6579
 Censored obs = 3172
 Uncensored obs = 3407
 Wald chi2(9) = 145.65
 Prob > chi2 = 0.0000

Table 4 - OOP Inpatient

	Coef.	Std. Err.	z	P> z 	[95% Conf. Interval]	
urban	-0.865	0.392	-2.200	0.028	-1.634	-0.096
q5	1.120	0.439	2.550	0.011	0.260	1.980
real_insi	-3.546	0.900	-3.940	0.000	-5.310	-1.783
cons	9.160	2.341	3.910	0.000	4.573	13.748
select						
employed	-0.233	0.081	-2.880	0.004	-0.391	-0.074
real_insi	0.497	0.103	4.830	0.000	0.296	0.699
constant	-0.075	0.051	-1.460	0.144	-0.175	0.026
mills						
lambda	-2.613	2.601	-1.000	0.315	-7.710	2.485
rho		-0.594				
sigma		4.395				
lambda	-2.613	2.601				

Number of obs = 1063
 Censored obs = 562
 Uncensored obs = 501
 Wald chi2(4) = 45.33
 Prob > chi2 = 0.0000

Table 5 – Outpatient Utilization

	Coef.	Std. Err.	z	P> z 	[95% Conf. Interval]	
yes_educ	0.368	0.057	6.420	0.000	0.256	0.480
financial_burden_o	-0.283	0.047	-6.020	0.000	-0.376	-0.191
constant	-0.073	0.055	-1.310	0.189	-0.181	0.036

Number of obs = 6579
LR chi2(2) = 118.52
Prob > chi2 = 0.0000
Pseudo R2 = 0.0130
Log likelihood = -4496.7597

Table 6 – Inpatient Utilization

	Coef.	Std. Err.	z	P> z 	[95% Conf. Interval]	
financial_burden_i	-0.006	0.002	-3.720	0.000	-0.010	-0.003
real_insi	0.609	0.173	3.530	0.000	0.271	0.948
employed	-0.403	0.131	-3.070	0.002	-0.661	-0.146
constant	0.084	0.095	0.880	0.380	-0.103	0.271

Number of obs = 1063
LR chi2(3) = 51.81
Prob > chi2 = 0.0000
Pseudo R2 = 0.0352
Log likelihood = -709.16089

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