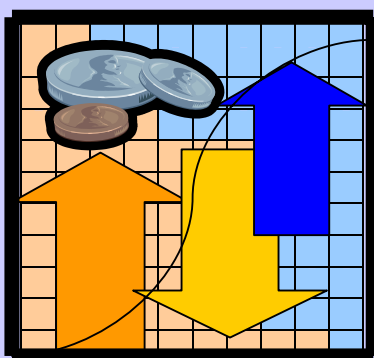




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**The elimination of user fees in Uganda:
impact on utilization and catastrophic
health expenditures**

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The views expressed in documents by named authors are solely the responsibility of those authors.

**The elimination of user fees in Uganda:
impact on utilization and catastrophic
health expenditures**

by

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Abstract

All user fees at first level government health facilities in Uganda were removed in March 2001. This study explores the impact on health service utilization and catastrophic health expenditures using data from National Household Surveys undertaken in 1997, 2000 and 2003. It controls for other possible determinants using regression. The abolition of user fees had different impacts on the poor and the non-poor. There was no clear change in either utilization or catastrophic expenditures in the non-poor. However, in the poor, utilization of public facilities increased substantially after the abolition of fees, but unexpectedly, the incidence of catastrophic expenditure did not fall. A possible explanation is that frequent unavailability of drugs at government facilities after 2001 forced patients to purchase from private pharmacies, with the extra payments for pharmaceuticals offsetting the reduction in payments for consultations. The study illustrates the complexity of developing financing systems in sub-Saharan Africa that allow people to access needed services but which also protect them against the financial risks of accessing care.

Abstract word count: 167

Keywords: Uganda, Africa, user fees, service utilization, catastrophic expenditure, poor

Full word count: 5823

Introduction

Preventive and curative health services, can make a substantial difference to peoples' health. This health improvement can in turn, provide poor households with the opportunity to escape from poverty.(Berki SE, 1986; Birnbaum H, Naierman N, Schwartz M & Wilson D, 1979; Kawabata K, Xu K & Carrin G, 2002; Van Damme W, Van Leemput L, Por I, Hardeman W & Meessen B, 2004; Whitehead M, Dahlgren G & Evans T, 2001) However, in order to obtain care, households in most countries of the world are asked to make out-of-pocket payments (OOPs) or co-payments for items such as consultation fees, investigatory tests, hospitalization and pharmaceuticals. These charges discourage some households from seeking care when it is needed.(Russell S & Gilson L, 1997) When they do seek care, the required payments can result in financial catastrophe with households being forced to borrow heavily or to reduce their other basic expenditures, on items such as on food, housing and clothing, to allow them to meet their health expenses.(Knaul F, Arreola H, Borja C, Méndez O & Torres AC, 2003; Wyszewianski L, 1986) These payments are sometimes be high enough to push households into poverty.(Pradhan M & Prescott N., 2002; Skarbinski J, Walker K, Baker LC, Kobaladze A, Kirtava Z & Raffin TA, 2002; Wagstaff A & Van Doorslaer E, 2003; Xu K, Evans DB, Kawabata K, Zeram dini R, Klavus J & Murray CJL, 2003) The unacceptable dilemma of health care in may countries is that if people do not seek care, the subsequent illness reduces their earning potential, but the very act of seeking care can itself result in financial catastrophe. A key concern of policy makers in many settings, has, therefore, been to ensure that services are available to people when they are needed, but also to ensure that the act of accessing care does not result in financial catastrophe.(Tangcharoensathien V, Wibulpholprasert S & Nitayaramphong S, 2004)

In Uganda, curative services are provided by a mix of public and private for-profit and private not-for-profit providers. Preventive interventions are provided by the public and private not-for-profit sectors. For curative care, there is no national health insurance system nor is the private insurance market well developed. A few small community-based insurance schemes exist. National health account estimates suggest that out-of-pocket payments (OOPs) made by households at the point of services for such items as medicines, tests and hospitalization have been in the order of 40-45% of total health expenditure over the last few years, typical of many countries in sub-Saharan Africa. (World Health Organization, 2004; Korte R, Richter H, Merkle F & Gorgen H, 1992) The remaining funding is provided by government, with a substantial and growing component of government expenditure derived from external sources such as donors and multilateral lending institutions.

Health services in public facilities were free before 1993.(Burnham G M, Pariyo G, Galiwango E & Wabwire-Mangen F, 2004) Subsequent decentralization of public sector services delivery, including health care, gave the local district health authorities the right to levy user fees for the services they rendered.(Deininger K & Mpuga P, 2004; Jeppsson A, 2001; Kipiriri L, Norheim OF & Heggenhougen K, 2003) The result was considerable variation across districts in how charges were levied. Some charged only for drugs; others charged for each service provided (e.g. consultation, laboratory tests, drugs, hospitalization); others charged flat fees where people paid a single annual fee which entitled them to access any needed service; while some districts chose not to impose any fees.(Kivumbi GW & Kintu F, 2002) Outpatients attending public hospitals had the choice of a "free window" if they could not pay, or a "pay window" if they could. Similarly, public hospitals also provided private beds for people who could pay, while

offering free inpatient care to those who could not. There is some evidence that the supply of medicines and the quality of services improved in some districts but, subsequent concerns that fees prevented poor people accessing needed services led to the abolition of all fees at first level public facilities in 2001.

The total funds generated through user fees was less than 5% of total health expenditure. (Okunzi S A, 2004) Upon the abolition of fees, government increased its funding for district health services to enable them to bridge the funding gap created by this abolition. The abolition resulted, however, in an increase in utilization and as a result drug 'stock-outs' became common in public health units. (Ministry of Health Uganda, 2004; WHO Country Office Uganda & SIDA, 2003)

This study explores changes in service utilization and catastrophic health expenditures at three points during the period 1997 and 2003. The points span the period from just before to just after the abolition of user fees. Special attention is paid to changes among the poor. The first part of this paper describes the available data, followed by a section of methodology. The next section describes the results followed by discussion and conclusions.

Data and variables

Data are from the nationally representative National Household Surveys (NHS) of 1997, 2000 and 2003. The surveys included 6,655, 10,691 and 9,710 households in turn, comprising 33,988, 53,761 and 47,468 individuals respectively. The survey of 1997 was included to allow for the fact that some changes might have been taking place before the removal of user fees in 2001.

The variables used in the analysis are those available from the surveys, and are listed in table 1. Analysis of utilization was based on the use of services for each individual reporting illness during the previous 30 days, as the dependent variable. Four options are provided in the surveys, namely use of a public, private, other facility/provider (NGO, faith-based or traditional providers) or non-use of any of those services. Information on the individual's age, sex, education and household income and expenditure was also available.

Catastrophic health expenditure is defined in relation to a household's capacity to pay.(Russell S, 1996) A household is considered to face financial catastrophe when its total out-of-pocket health payments equal or exceed 40% of its non-subsistence expenditure.(Murray C J L, Xu K, Evans D B, Kawabata K, Klavus J, Hanvoravongchai P et al. 2003) Out-of-pocket health payments refer to payments made by households at the point of receiving health services. It includes spending on alternative and/or traditional medicine but excludes expenditure on transportation to obtain care and special nutrition as these are related to different policy levers than payments for health services. Moreover, information on the latter variables is not available in the surveys.

Although both income and total consumption expenditure can be estimated from the responses to the surveys, reported consumption expenditure is used in the analysis in preference to reported income for two reasons. Firstly, the variance of current expenditure is smaller than the variance of current income over time. Income data reflects random shocks while expenditure data conforms better to the notion of effective income. In defining capacity to pay, it is important to try to eliminate the effect of random shocks on income to the greatest extent possible. Secondly, in most 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, tax or payroll data are not available, and survey respondents may not wish to reveal their true income for various reasons.(Bouis HE, 1994; Deaton A., 1992)

Notionally, the basic subsistence needs of all households, is set as the food expenditure of the households with the median food share in total household expenditure, adjusted for household size.(Xu K, Klavus J, Kawabata K, Evans DB, Hanvoravongchai P, Ortiz de Iturbide JP et al. 2003) In order to minimize measurement error, the calculations are based on the average food expenditure of households whose food expenditure share of total household expenditure was in the 45 to 55 percentile range. This estimate of basic subsistence needs also serves as the poverty line. A household whose total consumption expenditure is smaller than this level is regarded as poor.

Methodology

This study seeks to identify the impact of user fees on the utilization of health services and catastrophic health payments. Initially the analysis compares simple proportions in the three surveys - the proportion of people who reported sickness and who sought care from the different providers, and the proportion of households observed to have catastrophic expenditures due to out-of-pocket payments for health. These are reported separately for poor and non-poor households. Pearson's χ^2 test is used to test for significant differences in proportions. However, because observed changes could be related to other factors in addition to the elimination of user fees, more detailed analysis of the determinants is then undertaken using logistic regression for catastrophic expenditure and multinomial logistic regression for utilization. This controls for other possible determinants for which information is available from the sample surveys.

The regression models are applied to pooled data from all the surveys with survey year as a dummy variable to determine if there was a significant difference between the results before and after user fees were abolished. The analysis was undertaken firstly using unrestricted (full) models on the total pooled sample with a dummy variable designating if a household was poor or non-poor. It was also estimated using restricted models estimated separately for the poor and the non-poor. This allows a statistical test, the log likelihood ratio Chow test, to be used to test whether the coefficients of the equations are significantly different for the poor and non-poor compared to the pooled equations. The null hypothesis that the regression coefficients are the same is then rejected at a 0.05 significance level.

The analysis unit for considering catastrophic expenditure is the household. The dependent variable (*cata*) is defined as 1 where a household incurred catastrophic expenditure, and 0 otherwise. The probability of a household facing catastrophic expenditure is $\Pr(cata = 1 | X)$, the odds ratio (OR) is

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

where X is a vector of independent variables.

The odds ratio indicates how often catastrophic expenditure occurs relative to how often it does not occur for a household in a particular situation. It ranges from 0 when $\Pr(cata = 1 | X) = 0$ to ∞ when $\Pr(cata = 1 | X) = 1$. An odds ratio smaller than 1 for a dependent variable indicates that this factor protects a household from facing catastrophic

expenditure while an odds ratio greater than 1 indicates that the factor is linked to a higher probability that a household faces catastrophic expenditure.

After logit transformation, the linear model can be written as

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

where β is a vector of parameters.

Multinomial logistic regression is used in analyzing the utilization of services. Data are provided in the surveys at the individual level. The model is applied to people who reported illness during the last 30 days. The probability that a person seeks care at a particular type of facility can be written as:

$$\Pr(use = k | X) = \frac{\exp(X\beta^{(k)})}{\sum_{i=1}^4 \exp(X\beta^{(i)})} \quad (3)$$

Where $k = \begin{cases} 1 & \text{public} \\ 2 & \text{private} \\ 3 & \text{others} \\ 4 & \text{not use} \end{cases}$ and X is a vector of independent variables and β is a vector of parameters

In this study, we set 'not used' as the base category, namely $\beta^{(4)} = 0$. According to equation (5), the probability of $\Pr(use=4|X)$ becomes

$$\Pr(use = 4 | X) = \frac{1}{1 + \exp(X\beta^{(1)}) + \exp(X\beta^{(2)}) + \exp(X\beta^{(3)})} \quad (4)$$

From equations (3) and (4), we obtain the ORs of using public, private or other services compared to the base category of no use. They can be written as

$$\frac{\Pr(\text{use} = 1 | X)}{\Pr(\text{use} = 4 | X)} = \exp(X\beta^{(1)}), \quad \frac{\Pr(\text{use} = 2 | X)}{\Pr(\text{use} = 4 | X)} = \exp(X\beta^{(2)}) \text{ and so on.}$$

For a given x , say x_j , the ORs of choosing public, private or other facility services compared to no use are $\exp(\beta_j^{(1)})$, $\exp(\beta_j^{(2)})$ and $\exp(\beta_j^{(3)})$, respectively. The multinomial logistic regression assumes independence between the odds ratios of different alternatives. Therefore, the odds ratios are unaffected by whichever category is set as the baseline. (Green A H, 2000; Hjortsberg C, 2003)

Results

Table 2 shows that, in general, the use of health services among the population reporting illness increased from 1997 to 2001 and from 2001 to 2003. For the poor, the use of private and other facilities increased in both periods. However, the use of public facilities remained at similar levels between 1997 and 2000 while from 2000 to 2003 it increased substantially. For the non-poor the use of public facilities is similar across all three years. A different pattern is observed in the use of private facility services. For the poor there is a substantial increase from 1997 to 2000 but it remained at similar levels between 2000 and 2003. Among the non-poor a continuous increase in the use of private facility services is observed.

Table 2 also shows that before user fees were abolished, the proportion of households with catastrophic expenditure was significantly lower in 2000 than in 1997 among both the poor and non-poor. After the abolition of user fees in 2001, the incidence of catastrophic payments further decreased for the non-poor, but it increased among the poor.

Determinants of health service utilization

In order to control for other possible influences on changes in utilization, multinomial logistic regression was undertaken and the results are presented in table 3. The log likelihood ratio Chow test rejected the null hypothesis that the coefficients for the separate regressions of the poor and the non-poor were the same at the 0.001 level, so the separate equations for each group are reported here. The same applies for the analysis of catastrophic expenditure in the next section. The base category in table 3 is non-use of services when illness was reported. Very few households were observed to use “other facilities” so those results are not discussed further.

The main purpose of the paper is to determine if utilization increased after the elimination of user fees, controlling for other variables. These variables suggest that people above 65 years old were significantly less likely to use either public or private facilities when reporting illness than younger people, while children under the age of 5 years were more likely to do so. Education was not correlated with the use of public services but people living in households where the head had a relatively low level of education were less likely to use private facilities than those in other households. Income (measured using per capita expenditure) was weakly correlated with the use of public services for the poor, but significantly correlated with the use of private services. It was significantly correlated with the use of both public and private services for the non-poor. The odds ratios very close to 1 for income reflect the fact that income is measured as a continuous variable.

To examine the changes over time controlling for the above variables, patterns in 1997 and 2003 are compared to the base of 2000, the year immediately before consultation fees were abolished. The use of public facilities for the poor was slightly lower in 1997 than

2000, but the difference did not reach statistical significance at the 1% level after controlling for these other variables. On the other hand the poor used considerably more public services in 2003 compared to 2000, with high and statistically significant coefficients and odds ratios. Interestingly, although there was an increase in utilization of public facilities for the non-poor in both periods, the increase was slightly lower from 2000 to 2003, after fee abolition, than from 1997 to 2000 (the absolute value of the coefficient was smaller in the former case). The poor also used significantly more private services in 2003 compared to 2000, and the rate of increase was greater than between 1997 and 2000. For the non-poor, private facility use increased in both periods at an almost identical rate.

Determinants of catastrophic expenditure

Logistic regression was used to analyze whether the year of the survey was significantly correlated with the incidence of catastrophic expenditure holding other possible determinants constant. The binary dependent variable is equal to 1 when a household has catastrophic expenditure and zero otherwise. The same independent variables that were used for the utilization analysis are explored, apart from total income.

One of the main determinants of catastrophic expenditures was the use of services, not surprisingly, with the OR for private service use being higher than that for public service use for both poor and non-poor. Inpatient service use from both public and private facilities for the non-poor has a very high OR, while for the poor it was similar to the use of public outpatient facilities but less than the use of private out-patient facilities. Having household members aged over 65 and a household head with low education increased the odds of catastrophic health expenditures for poor and non-poor households alike. The size

of the coefficient suggests that the effect of age was more pronounced in the poor, while the effect of education was stronger in the non-poor.

Controlling for these variables, the incidence of catastrophic expenditures among the poor fell substantially from 1997 to 2000 but did not fall significantly thereafter despite the removal of the user fees. This is even after controlling for the increased use of services. On the other hand there was a slight, insignificant, decrease in catastrophic expenditure from 1997 to 2000 for the non-poor while the decrease from 2000 to 2003 was relatively large and statistically significant (the coefficient is -0.259 with an OR of 0.772).

Discussion

Before reaching conclusions, it is important to bear in mind the limitations of a study based on three separate cross-sectional surveys, the only available data. Firstly, out-of-pocket expenditure was recorded for a one-month period and catastrophic expenditure was based on expenditures reported in that specific month. It may well be possible for the non-poor to recover more quickly from a financial shock than the poor who could suffer the results of financial catastrophe for a longer period. This can only be explored with panel data, which are rarely available. Secondly, for a patient the quality of service in public facilities has been shown to be an important determinant of the choice of provider, but no direct information on quality of service was available from the surveys. Thirdly, changes in financing policy or in other aspects of health system design cannot be evaluated like a clinical trial where all other factors are held constant for the duration of the trial. Many factors change at the same time and it is a complex process to try to establish causality. This is clearly relevant to all countries in which health system reforms are taking place, not just Uganda.

Nevertheless, some important findings emerge. The abolition of user fees at public facilities made them more accessible to everyone. Not surprisingly, both poor and non-poor households used them more. However, both groups had also increased their use of public facilities between 1997 and 2000, and for the non-poor the increase had been greater in the earlier period. So for the non-poor, there is no real evidence that the abolition of fees increased demand for public services. For the poor, however, the evidence shows that use increased substantially subsequent to the abolition of fees.

Holding all other factors constant, economic theory suggests that lower cost services in the public sector would encourage a switch from the private to the public sectors if the quality of care does not change in either type of facility. This does not seem to have happened. The use of private services increased continuously from 1997 to 2003 for both poor and non-poor. A number of possible explanations exist. The improvement of the general economy may have led to an increase in demand for both public and private services, although we have tried to control for this by including income as an independent variable in the regressions. Alternatively, anecdotal evidence suggests that the removal of user fees meant that medicines were frequently unavailable (called 'stock outs') at public facilities and some people might have decided to seek care at private facilities as a result. There is no way of testing these hypotheses using the available data.

Catastrophic expenditure for the non-poor declined from 2000 to 2003 after the abolition of user fees, while it surprisingly remained at the same level for the poor. The latter effect could also be related to the reported stock-outs of drugs, which forced patients attending public facilities to purchase drugs from the private sector, as well as encouraging people to go directly to the private sector as suggested above. In fact, the most important

determinant of catastrophic expenditure for the poor observed in the regressions was the use of private facilities.

The abolition of user fees did, therefore, seem to have a beneficial effect in that it encouraged more poor people to seek care at public facilities when they were ill. This reduced one important barrier to care. It did not, however, reduce the proportion of poor households that subsequently faced catastrophic health expenditures. Poor households in Uganda, as in many African countries, still face difficult choices - seeking care when they are ill will improve their health, but the act of seeking care can result in financial catastrophe. This is a key challenge for policy makers over the next decade. At present large quantities of external funds for health are flowing into many African countries which enables services to be heavily subsidized. However, the challenge will be to build sustainable financing systems which reduce barriers to access care while at the same time protecting people against the financial risks of accessing care.

REFERENCES

- Berki SE (1986). A Look At Catastrophic Medical Expenses And the Poor. *Health Affairs* 5(4) 139-145.
- Birnbaum H, Naierman N, Schwartz M, & Wilson D (1979). Focusing the catastrophic illness debate. *Quarterly Review of Economic Business* 19(3) 17-33.
- Bouis HE (1994). The effect of income on demand for food in poor countries: are our food consumption database giving us reliable estimates? *Journal of Development Economics* 44 199-226.
- Burnham G M, Pariyo G, Galiwango E, & Wabwire-Mangen F (2004). Discontinuation of cost sharing in Uganda. *Bulletin of the World Health Organization* 82(3), 187-195.
- Deaton A. (1992). *Understanding consumption*. Oxford: Oxford University Press.
- Deininger K, & Mpuga P (2004). Economic and welfare effects of the abolition of health user fees: Evidence from Uganda. *The World Bank, Policy Research Working Paper Series* 3276.
- Green A H (2000). *Econometric analysis*. New Jersey: Prentice-Hall, Upper Saddle River.
- Hjortsberg C (2003). Why do the sick not utilise health care? The case of Zambia. *Health Economics* 12 755-770.
- Jeppsson A (2001). Financial priorities under decentralization in Uganda. *Health Policy and Planning* 16(2) 187-192.
- Kapiriri L, Norheim OF, & Heggenhougen K (2003). Public participation in health planning and priority setting at the district level in Uganda. *Health Policy and Planning* 18(2) 205-213.
- Kawabata K, Xu K, & Carrin G (2002). Preventing Impoverishment Through Protection Against Catastrophic Health Expenditure. *Bulletin of the World Health Organization* 80(8), 612.
- Kivumbi GW, & Kintu F (2002). Exemptions and waivers from cost sharing: Ineffective safety nets in decentralised districts in Uganda. *Health Policy and Planning* 17(Supplementary 1) 64-71.
- Knaul F, Arreola H, Borja C, Méndez O, & Torres AC (2003). El Sistema de Protección Social en Salud de México: efectos potenciales sobre la justicia financiera y los gastos catastróficos de los hogares. In Knaul F, & Nigenda G (Eds.), *Caleidoscopio de la salud, de la investigación a las políticas, y de las políticas a la acción* México: Fundación Mexicana para la Salud.
- Korte R, Richter H, Merkle F, & Gorgen H (1992). Financing health services in sub-Saharan Africa: Options for decision makers during adjustment. *Social Science and Medicine* 34(1) 1-9.

Ministry of Health Uganda, W.C.O.U. Sub-national (district) health system performance assessment report. 2004.

Ref Type: Report

Murray C J L, Xu K, Evans D B, Kawabata K, Klavus J, Hanvoravongchai P, & Zeramardini R (2003). Assessing the distribution of household financial contributions to the health system: concepts and empirical application. In Murray CJL, & Evans DB (Eds.), *Health systems performance assessment: debates, methods and empiricism* Geneva: World Health Organization.

Okuonzi S A (2004). Dying for economic growth? Evidence of a flawed economic policy in Uganda. *The Lancet* 364(October 30), 1632-1637.

Pradhan M, & Prescott N. (2002). Social risk management options for medical care in Indonesia. *Health Economics* 11(5), 431-446.

Russell S (1996). Ability to pay for health care: Concepts and evidence. *Health Policy and Planning* 11(3) 219-237.

Russell S, & Gilson L (1997). User Fee Policies to Promote Health Service Access for Poor: A Wolf in Sheep's Clothing? *International Journal of Health Services* 27(2), 359-379.

Skarbinski J, Walker K, Baker LC, Kobaladze A, Kirtava Z, & Raffin TA (2002). The Burden of Out-of-Pocket Payments for Health Care in Tbilisi, Republic of Georgia. *Jama* 287(8), 1043-1049.

Tangcharoensathien V, Wibulpholprasert S, & Nitayaramphong S (2004). Knowledge-based changes to health systems: the Thai experience in policy development. *Bulletin of the World Health Organization* 82(10), 750-754.

Van Damme W, Van Leemput L, Por I, Hardeman W, & Meessen B (2004). Out of pocket health expenditure and debt in poor households: Evidence from Cambodia. *Tropical Medicine & International Health* 9(2) 273-280.

Wagstaff A, & Van Doorslaer E (2003). Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993-1998. *Health Economics* 12 921-934.

Whitehead M, Dahlgren G, & Evans T (2001). Equity and health sector reforms: Can low-income countries escape the medical poverty trap? *The Lancet* 358(9284) 833-836.

WHO Country Office Uganda, & SIDA, M.o.H.U. The effects of abolition of cost-sharing in Uganda. 2003.

Ref Type: Report

World Health Organization (2004). *World Health Report 2004*. Geneva: World Health Organization.

Wyszewianski L (1986). Families with catastrophic health care expenditures. *Health Services Research* 21(5) 617-634.

Xu K, Evans DB, Kawabata K, Zeramdini R, Klavus J, & Murray CJL (2003). Household catastrophic health expenditure: a multicountry analysis. *The Lancet* 362 111-117.

Xu K, Klavus J, Kawabata K, Evans DB, Hanvoravongchai P, Ortiz de Iturbide JP, Zeramdini R, & Murray CJL (2003). Household health system contributions and capacity to pay: definitional, empirical and technical challenges. In Murray CJL, & Evans DB (Eds.), *Health systems performance assessment: debates, methods and empiricism* Geneva: World Health Organization.

Table 1. Variables used in the analysis

| Variable | Variable label | Note | Mean | | | |
|--|--|---------------------|-------|-------|-------|--|
| | | | 1997 | 2000 | 2003 | |
| Utilization of health services (dependent variable)* | | | | | | |
| | public | | 0.217 | 0.239 | 0.244 | |
| | private | | 0.376 | 0.458 | 0.526 | |
| | others | | 0.001 | 0.005 | 0.044 | |
| | not use (Base category) | | 0.406 | 0.299 | 0.187 | |
| Catastrophic expenditure (dependent variable) | | | 0.048 | 0.032 | 0.029 | |
| age65i* | Is the person above 65 years old? | 1. yes 0. no | 0.045 | 0.057 | 0.020 | |
| age5i* | Is the person under 5 years old? | 1. yes 0. no | 0.234 | 0.270 | 0.181 | |
| age65 | Is there any member above 65 years old in the household? | 1. yes 0. no | 0.129 | 0.140 | 0.083 | |
| edu | Household head with less than one year schooling | 1. yes 0. no | 0.276 | 0.289 | 0.194 | |
| pub | Any member used public health facility | 1. yes 0. no | 0.208 | 0.215 | 0.225 | |
| prv | Any member used private health facility | 1. yes 0. no | 0.328 | 0.375 | 0.431 | |
| use_inp | Any member used inpatient services | 1. yes 0. no | 0.024 | 0.016 | 0.028 | |
| eqexp | Per capita household expenditure per month | continuous variable | 42311 | 60234 | 65859 | |
| poor | Is this household living under the poverty line | 1. yes 0. no | 0.241 | 0.207 | 0.183 | |

* Only for those who reported illness.

Table 2. Catastrophic expenditure and the use of health services (%)

| | | Poor | Non-poor | Total |
|--------------|------|-------|----------|-------|
| Catastrophic | | | | |
| | 1997 | 6.22 | 4.37 | 4.82 |
| | 2000 | 2.35 | 3.36 | 3.15 |
| | 2003 | 3.11 | 2.87 | 2.92 |
| Utilization | | | | |
| Public | 1997 | 22.75 | 21.25 | 21.74 |
| | 2000 | 23.02 | 24.04 | 23.85 |
| | 2003 | 33.67 | 22.73 | 24.37 |
| Private | 1997 | 24.88 | 40.26 | 37.56 |
| | 2000 | 32.04 | 48.79 | 45.76 |
| | 2003 | 34.53 | 55.75 | 52.59 |
| Others | 1997 | 0.27 | 0.08 | 0.11 |
| | 2000 | 0.75 | 0.44 | 0.49 |
| | 2003 | 3.79 | 4.45 | 4.35 |
| Not use | 1997 | 52.10 | 38.14 | 40.58 |
| | 2000 | 44.20 | 26.73 | 29.90 |
| | 2003 | 28.02 | 17.06 | 18.70 |

All the differences across years are significant at 5% level.

Table 3. Coefficients in multinomial Logistic regression for utilization
(base category=no use of services)

| | Poor | | | | Non-poor | | | |
|---------------------------|-------|----------|-----------|-------|----------------------------|---------|-----------|-------|
| | OR | Coef. | Std. Err. | P>z | OR | Coef. | Std. Err. | P>z |
| Public facility | | | | | | | | |
| yr1997 | 0.870 | -0.139 | 0.080 | 0.081 | 0.635 | -0.454 | 0.039 | 0.000 |
| yr2003 | 2.338 | 0.849 | 0.078 | 0.000 | 1.479 | 0.392 | 0.040 | 0.000 |
| age65i | 0.622 | -0.475 | 0.132 | 0.000 | 0.751 | -0.287 | 0.082 | 0.000 |
| age5i | 1.216 | 0.195 | 0.075 | 0.009 | 1.247 | 0.221 | 0.039 | 0.000 |
| edu | 1.030 | 0.030 | 0.065 | 0.651 | 1.052 | 0.050 | 0.041 | 0.214 |
| eqexp | 1.000 | 1.4E-05 | 0.000 | 0.058 | 1.000 | 1.8E-06 | 0.000 | 0.000 |
| _cons | | -0.932 | 0.154 | 0.000 | | -0.262 | 0.039 | 0.000 |
| Private facility | | | | | | | | |
| yr1997 | 0.777 | -0.253 | 0.077 | 0.001 | 0.597 | -0.515 | 0.033 | 0.000 |
| yr2003 | 1.821 | 0.599 | 0.076 | 0.000 | 1.715 | 0.539 | 0.035 | 0.000 |
| age65i | 0.512 | -0.670 | 0.138 | 0.000 | 0.666 | -0.406 | 0.072 | 0.000 |
| age5i | 1.436 | 0.362 | 0.070 | 0.000 | 1.333 | 0.287 | 0.034 | 0.000 |
| edu | 0.734 | -0.309 | 0.064 | 0.000 | 0.814 | -0.206 | 0.036 | 0.000 |
| eqexp | 1.000 | 5.6E-05 | 0.000 | 0.000 | 1.000 | 5.4E-06 | 0.000 | 0.000 |
| _cons | | -1.333 | 0.155 | 0.000 | | 0.242 | 0.033 | 0.000 |
| Other facilities | | | | | | | | |
| yr1997 | 0.304 | -1.190 | 0.506 | 0.019 | 0.132 | -2.026 | 0.403 | 0.000 |
| yr2003 | 7.738 | 2.046 | 0.264 | 0.000 | 15.183 | 2.720 | 0.148 | 0.000 |
| age65i | 0.667 | -0.404 | 0.528 | 0.444 | 0.576 | -0.551 | 0.345 | 0.111 |
| age5i | 1.113 | 0.107 | 0.261 | 0.682 | 1.240 | 0.215 | 0.115 | 0.060 |
| edu | 1.369 | 0.314 | 0.211 | 0.136 | 0.784 | -0.243 | 0.132 | 0.065 |
| eqexp | 1.000 | -6.2E-06 | 0.000 | 0.791 | 1.000 | 4.5E-06 | 0.000 | 0.000 |
| _cons | | -4.100 | 0.518 | 0.000 | | -4.367 | 0.153 | 0.000 |
| Number of obs = 6454 | | | | | Number of obs = 31829 | | | |
| LR χ^2 (18) = 515.77 | | | | | LR χ^2 (15) = 2509.98 | | | |
| Log likelihood = -7111.91 | | | | | Log likelihood = -34067.41 | | | |
| P = 0.000 | | | | | P = 0.000 | | | |

Likelihood-ratio Chow test: LR χ^2 = 414.29 p=0.000

[illegible]

