

Understanding the impact of eliminating user fees: Utilization and catastrophic health expenditures in Uganda

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Abstract

There is currently considerable discussion between governments, international agencies, bilateral donors and advocacy groups on whether user fees levied at government health facilities in poor countries should be abolished. It is claimed that this would lead to greater access for the poor and reduce the risks of catastrophic health expenditures if all other factors remained constant, though other factors rarely remain constant in practice. Accordingly, it is important to understand what has actually happened when user fees have been abolished, and why. All 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. Utilization increased for the non-poor, but at a lower rate than it had in the period immediately before fees were abolished. Utilization among the poor increased much more rapidly after the abolition of fees than beforehand. Unexpectedly, the incidence of catastrophic health expenditure among the poor did not fall. The most likely explanation is that frequent unavailability of drugs at government facilities after 2001 forced patients to purchase from private pharmacies. Informal payments to health workers may also have increased to offset the lost revenue from fees. Countries thinking of removing user charges should first examine what types of activities and inputs at the facility level are funded from the revenue collected by fees, and then develop mechanisms to ensure that these activities can be sustained subsequently.

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Introduction

Preventive and curative health services can make a substantial difference to peoples' health, and health improvements can, in turn, provide poor households with the opportunity to escape from poverty (Kawabata, Xu, & Carrin, 2002; Van Damme, Van Leemput, Por, Hardeman, & Meessen, 2004; Whitehead, Dahlgren, & Evans, 2001). However, physical, cultural and financial barriers can reduce accessibility of health care, even

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where services exist (Penchansky & Thomas, 1981). User fees for such items as consultations, investigations, hospitalization and medication, prevalent in almost all low-income countries, are one potential barrier to care (Russell & Gilson, 1997).

There has been extensive debate about the advantages and disadvantages of user fees in low-income countries for over a decade (Arhin-Tenkorang, 2001; Gilson, 1988; Gilson & Mills, 1995; Griffin, 1992; McPake, 1993; Palmer, Mueller, Gilson, Mills, & Haines, 2004). In poor countries, governments face considerable problems raising revenue for health from taxes or social health insurance premiums, partly because people are poor, and partly because a high proportion work in the informal sector where it is difficult to identify how much they earn and to develop efficient revenue collection mechanisms (Creese & Kutzin, 1995). User fees have been used to raise additional funds for government services. Moreover, if fees are levied only on people who can afford them, the revenue could be used to provide services for the poor (Vogel, 1988; Whitehead et al., 2001).

In some settings, staff at health facilities have been allowed to retain a proportion of the revenue raised to finance improvements of physical infrastructure, provide incentives to staff or purchase pharmaceuticals (Audi-bert & Mathonnat, 2000; Kipp, Kamugisha, Jacobs, Burnham, & Rubaale, 2001; Litvack & Bodart, 1993; Palmer et al., 2004; Witter, 2005). Where this has happened, utilization has sometimes increased after the introduction of fees (Akashi, Yamada, Huot, Kanai, & Sugimoto, 2004; Chawla & Ellis, 2000; Singh, 2003). Conversely, many studies suggest that fees introduced in public facilities have simply reduced accessibility and utilization, possibly because they have not been used to improve services (Jacobs & Price, 2004; Meuwissen, 2002; Mwabu, Mwanzia, & Liambila, 1995; Thomason, Mulou, & Bass, 1994; Van der Geest et al., 2000). In addition, households unable to use services because of the fees are more likely to purchase medication without professional advice, leading to inappropriate treatment and contributing to the development of drug resistance (Asenso-okyere, Anum, Osei-Akoto, & Adukonu, 1998).

Where user fees have been introduced, the administrative costs of collection have sometimes been high—e.g., 67% of the revenues collected in Honduras was absorbed by these administrative costs (Fiedler & Suazo, 2002). Their net contribution to total recurrent government health expenditure has also generally been low, often in the order of 5% (Gilson & Mills, 1995). Despite this, they can make substantial contributions to the ability of the public sector to provide inputs such as pharmaceuticals (Poletti, 2003).

Although this evidence is mixed, it is clear that where fees are charged, some households obtaining care suffer financial catastrophe as a result. To meet their health

expenses, they can be forced to borrow or to reduce other basic expenditures on items such as food and shelter (Knaul, Arreola, Borja, Méndez, & Torres, 2003; Wyszewianski, 1986). These payments are sufficient to push some into poverty (Pradhan & Prescott, 2002; Wagstaff & Van Doorslaer, 2003; Xu, Evans et al., 2003).

Different institutions have taken different positions on the balance between the potential costs and benefits of user fees as a means of financing government health services. In the late 1980s, UNICEF and WHO supported the Bamako initiative in Africa where payment for drugs was a key component (McPake, Hanson, & Mills, 1993) and the World Bank is believed to have encouraged fees for health services in Africa in the 1980s and 1990s (Okunzi & Macrae, 1995; World Bank, 1987). However, a number of governments and agencies are now reassessing their stance based on the inability of some households to afford care, and a number of NGOs and advocacy groups have been lobbying to have fees abolished (Coalition for Health and Education Rights, 2002; England, Kaddar, Nigam, & Pinto, 2001; Russell, 2004; Van Dam & Hutchinson, 2001; Witter, 2005; World Health Organization, 2005a, b).

An important question, therefore, is what changes could be expected in countries charging fees if they are eliminated. The above discussion suggests that if there is no change in the quality of services—including staff motivation and the availability of pharmaceuticals—utilization should increase and the incidence of financial catastrophe due to health payments fall. Government would lose revenue. In most cases, this will be a small proportion of total government spending, but where fees have contributed a substantial component of non-salary recurrent expenditure, it could restrict the ability of the public sector to provide inputs such as pharmaceuticals.

Where fees had been retained at health facilities and their elimination reduces service quality, the net effect is unclear. Utilization could rise or fall depending on whether the effect of the reduction in quality outweighed the effect of the reduction in cost. So could the incidence of financial catastrophe—if pharmaceuticals are no longer provided in the public sector after the elimination of fees, forcing households to purchase them in the private sector, the incidence of catastrophic health payments could rise. But if this increase were offset by the reduction in fees at government facilities, the incidence would fall.

Uganda offers the opportunity to examine the net effect of the elimination of fees in practice, rather than in theory. Fees at first line public facilities were abolished in 2001. Three studies of the impact are available, two based on a review of facility attendance records, and one using data from household surveys undertaken in 2000 and 2003 (Burnham, Pariyo, Galiwango, &

Wabwire-Mangen, 2004; Deininger & Mpuga, 2004; Nabyonga et al., 2005). All three considered only the impact on utilization, reporting that utilization at public facilities increased after fees were abolished.

While there is no reason to doubt this, the studies provide only partial evidence of the net impact. Firstly, they did not consider the effect on catastrophic expenditures. Secondly, they suffer from a problem common to all “before and after” studies in that they are unable to determine if the observed changes were truly due to the elimination of charges. This study seeks to address these two shortcomings by analyzing data contained in three household utilization and expenditure surveys—from 1997, 2000 and 2003. We examine changes in utilization as well as changes in catastrophic expenditure due to out-of-pocket payments (OOPs) for health services, controlling for as many of the possible exogenous determinants as possible.

This strengthens the conclusions in two ways. Firstly, it allows the impact of the reduction in fees to be separated from those of other determinants. Secondly, it reveals whether any changes after 2000 simply followed trends in the earlier period, or whether they differed in direction or magnitude from those from 1997 to 2000. Accordingly, we can be more confident that any observed changes can be attributed to the elimination of fees than is possible from the earlier studies.

The next section describes key characteristics of the Ugandan health system followed by a description of the available data and the analytical methods. The results are then presented followed by conclusions for Uganda and for the wider discussion of user fees.

Health services in Uganda

Curative services in Uganda are provided by a mix of public, private for-profit and private not-for-profit providers. The public and private not-for-profit sectors provide preventive interventions. There is no national health insurance system nor is the private insurance market well developed. Only a few small community-based insurance schemes exist. OOPs made by households at the point of service have been in the order of 40–45% of total health expenditure, typical of many countries in sub-Saharan Africa (World Health Organization, 2004). The remaining funding is provided by government, with a substantial and growing component of government expenditure derived from donors and lending institutions. Indeed, some donors have taken responsibility for funding health services in selected districts (Derriennic & Kiwanuka-Mukiibi, 2005). Despite this, the geographical distribution of services remains uneven (Uganda Ministry of Health, 2003).

Public facility services were officially free before 1993 (Burnham et al., 2004) although informal payments to

health workers were widespread (Konde-Lule & Okello, 1998; McPake et al., 1999). Subsequent decentralization gave district health authorities the right to levy fees and there was considerable variation in the way they exercised this right (Deininger & Mpuga, 2004; Jeppson, 2001; Kapiriri, Norheim, & Heggenhougen, 2003). Some charged only for drugs; some charged for each service provided (e.g., consultation, laboratory tests, drugs, hospitalization); some charged an annual fee entitling people to access any service during the year; while a few chose not to impose any official fees (Kivumbi & Kintu, 2002).

User fees supported around 5% of the total expenses at the facility level (Okuonzi, 2004). Upon their abolition, government increased its funding to district health services, a move designed to compensate them for any lost revenue.

Data and variables

Data are from the nationally representative Socio-economic Surveys of 1997, 2000 and 2003 (Government of Uganda, 2000). The surveys included responses from 6655, 10,691 and 9710 households in turn, comprising 33,988, 53,761 and 47,468 individuals.

The variables used in the analysis are those available from the surveys (Table 1). Analysis of utilization was based on the use of services for each individual reporting illness during the previous 30 days. These people were asked about the actions they had taken in response, with four options provided—use of a public, private or other provider (NGO, faith-based or traditional), or non-use of any of these. Information on household income and expenditure derived from the surveys was used to estimate catastrophic expenditures, while socioeconomic characteristics used in the analysis were income, age, sex, education and place of residence (urban/rural).

Catastrophic health expenditure is defined in relation to a household's capacity to pay (Russell, 1996). In this study, a household is considered to have faced financial catastrophe when its total out-of-pocket health payments equaled or exceeded 40% of its non-subsistence expenditure (Murray et al., 2003). Out-of-pocket health payments are those made by households at the point of receiving health services and includes cash and in-kind payments reported in the surveys. Spending on alternative and traditional medicine is incorporated but not expenditure on transportation to obtain care nor special nutrition. These data were not available.

The estimation of non-subsistence income requires data on total income and the subsistence component. Although both income and total consumption expenditure can be estimated from the surveys, reported consumption expenditure is used in preference to reported income. The first reason is that expenditure

Table 1
Variables used in the analysis

Variable	Variable label	Note	Mean		
			1997	2000	2003
Utilization of health services (dependent variable) ^a					
	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
age65i ^a	Is the person above 65 years old?	1. yes, 0. no	0.045	0.057	0.020
age5i ^a	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
male	Household head	1. yes, 0. no	0.727	0.693	0.465
edu	Household head with less than 1 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	42,311	60,234	65,859
poor	Is this household living under the poverty line	1. yes, 0. no	0.241	0.207	0.183
urban	Is this household in an urban area	1. yes, 0. no	0.153	0.157	0.171

^aOnly for those who reported illness.

fluctuates less than income over time. Income data reflect random shocks while expenditure data conform better to the notion of effective income. The second reason expenditure data from household surveys are mostly more reliable than income data, particularly in developing countries where the informal sector is relatively large, tax or payroll data are not available, and survey respondents may not wish to reveal their true income (Bouis, 1994; Deaton, 1992).

Given that the ratio of food expenditure to a household's total expenditure rises as income rises (Zimmerman, 1932), subsistence needs were defined as the food expenditure of the household with the sample median food share of total expenditure. However, in order to minimize measurement error, the calculations are based on the average food expenditure of households whose food expenditure share was in the 45–55 percentile range. To calculate non-subsistence income, this figure was subtracted from total household consumption expenditure after adjusting for household size. Full details are provided in Xu, Klavus et al. (2003). The estimate of basic subsistence requirements also serves as the poverty line for classifying survey respondents as poor or non-poor. A household whose total consumption expenditure is smaller than this level was regarded as poor.

Methodology

To explore the impact of the abolition of user fees, the analysis initially compares simple proportions in the

three surveys—the proportion of people who reported sickness and who sought care from the different types of providers, and the proportion of households estimated to have catastrophic expenditures due to out-of-pocket health payments. Results are reported separately for poor and non-poor households. Pearson's χ^2 test is used to test for significant differences in proportions (Gujarati, 1995). However, because observed changes could be related to other factors in addition to the elimination of fees, more detailed analysis of the determinants is then undertaken using logistic regression for catastrophic expenditure and multinomial logistic regression for utilization.

The regression models were applied to pooled data from all the surveys with survey year as a dummy variable to identify any differences in the relationship before and after 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 then estimated using separate restricted models for the poor and the non-poor. The log likelihood-ratio Chow test was used to test whether the coefficients of the separate equations were significantly different for the two groups compared to the pooled equation (Gujarati, 1995). The null hypothesis that the regression coefficients were the same was tested at the 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 facing catastrophic expenditure is

$Pr(\text{cata} = 1|\mathbf{X})$, the odds ratio (OR) is

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

where \mathbf{X} is a vector of independent variables \mathbf{x} .

The OR indicates how often catastrophic expenditure occurs relative to how often it does not occur for a household with given characteristics, ranging from 0 when $Pr(\text{cata} = 1|\mathbf{X}) = 0$ to ∞ when $Pr(\text{cata} = 1|\mathbf{X}) = 1$. An OR smaller than 1 for any \mathbf{x} indicates that this factor protects households from financial catastrophe while a ratio greater than 1 indicates the opposite.

After logit transformation, the linear model becomes

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

where $\boldsymbol{\beta}$ is a vector of parameters.

Multinomial logistic regression is used to analyze the utilization of services (Hjortsberg, 2003). The probability that a person reporting illness sought care at a particular type of facility can be written as

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

$$k = \begin{cases} 1, & \text{public,} \\ 2, & \text{private,} \\ 3, & \text{others,} \\ 4, & \text{not use,} \end{cases}$$

where k denotes the choice, \mathbf{X} is a vector of independent variables and $\boldsymbol{\beta}^{(k)}$ is a vector of parameters when choosing k .

In this study, we set ‘not used’ as the base category, namely $\boldsymbol{\beta}^{(4)} = 0$. From Eq. (3), the probability of non-use becomes

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

From Eqs. (3) and (4), the ORs of using public, private or other services compared to the base category of non-use can be written as

$$\frac{Pr(\text{use} = 1|\mathbf{X})}{Pr(\text{use} = 4|\mathbf{X})} = \exp(\mathbf{X}\boldsymbol{\beta}^{(1)}),$$

$$\frac{Pr(\text{use} = 2|\mathbf{X})}{Pr(\text{use} = 4|\mathbf{X})} = \exp(\mathbf{X}\boldsymbol{\beta}^{(2)})$$

and so on.

For a given \mathbf{x} , say x_j , the ORs of choosing public, private or other facility services compared to no use are $\exp(\boldsymbol{\beta}_j^{(1)})$, $\exp(\boldsymbol{\beta}_j^{(2)})$ and $\exp(\boldsymbol{\beta}_j^{(3)})$, respectively. The multinomial logistic regression assumes independence between the ORs of different alternatives so that the

ORs are unaffected by whichever category is set as the baseline (Green, 2000; Hjortsberg, 2003).

Results

Table 2 shows that, for the sample as a whole, the use of health services among the population reporting illness increased from 1997 to 2000 and from 2000 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 in both periods. A different pattern is observed in the use of private facility services. For the poor there was a substantial increase from 1997 to 2000 but it did not increase further thereafter. Among the non-poor a continuous increase in the use of private facility services occurred.

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

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

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

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

increased among the poor. Because these results could be confounded by other changes that occurred at the same time, the next sections control for other possible determinants.

Determinants of health service utilization

Table 3 reports the results of the multinomial logistic regression controlling for other possible influences on utilization. The log likelihood-ratio Chow test rejected the null hypothesis that the coefficients of the separate regressions for the poor and the non-poor were the same at the 0.001 level, so the separate equations for each group are reported. The same applies to 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 individuals (12 and 74 observations

in 1997 and 2000) used “other facilities” so those results are not discussed further.

Table 3 suggests that people over the age of 65 years were significantly less likely to use both public and private facilities when reporting illness than younger people. Children under the age of 5 years were more likely to. Education was not correlated with the use of public services but people living in households where the head was poorly educated were less likely to use private facilities than those in other households. Income (measured using total consumption expenditure) was weakly correlated with the use of public services and significantly correlated with the use of private services for the poor. It was significantly correlated with the use of both public and private services for the non-poor.

Households living in urban areas were more likely to use public and private health services than those in rural

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.	$P > z$
<i>Public facility</i>								
yr1997	0.843	-0.171	0.081	0.034	0.617	-0.484	0.040	0.000
yr2003	2.255	0.813	0.079	0.000	1.452	0.373	0.041	0.000
age65i	0.620	-0.479	0.133	0.000	0.768	-0.265	0.082	0.001
age5i	1.223	0.202	0.075	0.007	1.233	0.210	0.040	0.000
edu	1.009	0.009	0.065	0.885	1.048	0.047	0.041	0.246
eqexp	1.000	1.3E-05	7.3E-06	0.070	1.000	1.1E-06	4.0E-07	0.008
urban	1.465	0.382	0.108	0.000	1.098	0.093	0.038	0.013
_cons		-0.932	0.155	0.000		-0.236	0.039	0.000
<i>Private facility</i>								
yr1997	0.759	-0.276	0.077	0.000	0.565	-0.570	0.035	0.000
yr2003	1.782	0.578	0.077	0.000	1.669	0.512	0.035	0.000
age65i	0.501	-0.692	0.140	0.000	0.682	-0.383	0.072	0.000
age5i	1.443	0.367	0.070	0.000	1.325	0.281	0.034	0.000
edu	0.723	-0.325	0.064	0.000	0.819	-0.200	0.036	0.000
eqexp	1.000	5.6E-05	7.3E-06	0.000	1.000	4.8E-06	3.3E-07	0.000
urban	1.335	0.289	0.108	0.007	1.198	0.181	0.032	0.000
_cons		-1.331	0.155	0.000		0.243	0.033	0.000
<i>Other facility</i>								
yr1997	0.291	-1.234	0.507	0.015	0.143	-1.944	0.404	0.000
yr2003	7.488	2.013	0.265	0.000	16.101	2.779	0.149	0.000
age65i	0.506	-0.682	0.602	0.257	0.515	-0.663	0.365	0.069
age5i	1.013	0.013	0.265	0.960	1.327	0.283	0.112	0.012
edu	1.215	0.195	0.210	0.353	0.753	-0.284	0.132	0.031
eqexp	1.000	-1.3E-05	2.3E-05	0.574	1.000	4.8E-06	3.2E-07	0.000
urban	1.295	0.259	0.323	0.424	0.747	-0.292	0.098	0.003
_cons		-3.881	0.510	0.000		-4.350	0.148	0.000
	Number of obs. = 6450				Number of obs. = 31,856			
	LR $\chi^2(18) = 537.3$				LR $\chi^2(18) = 2589.4$			
	Log likelihood = -7102.4				Log likelihood = -34,062.4			
	Prob. > $\chi^2 = 0.0000$				Prob. > $\chi^2 = 0.0000$			

Note: Likelihood-ratio Chow test: LR $\chi^2 = 411.3$, $p = 0.000$.

areas. This result holds for poor and non-poor households but is more pronounced among the former. The sex of the household head was also tested but did not reach statistical significance in any model.

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 fees were abolished. The use of public facilities for the poor who reported illness was slightly lower in 1997 than 2000, but the difference did not reach statistical significance at the 1% level after controlling for 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 ORs. 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 than in 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. The converse of these results is that there was a decline in non-use of services for both groups over the entire period.

Determinants of catastrophic expenditure

In the logistic regressions, the binary dependent variable was set to 1 when a household had catastrophic expenditure and zero otherwise. The same independent variables used in the utilization equations were explored.

One of the main determinants of catastrophic expenditure was having used some type of health service, not surprisingly, with the OR for private higher than that for public facilities, for both poor and non-poor (Table 4). For the non-poor, using inpatient services was the most important risk factor, demonstrated by the high ORs for public and private inpatient services. For the poor, using private outpatient facilities was the most risky choice. Having household members aged over 65 and a household head with little 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.

Living in an urban area was protective against financial catastrophe for the non-poor, but not for the poor using the usual cut points for statistical significance. The sex of the household head did not influence the probability of catastrophic expenditure among the poor, but female-headed households were more likely to encounter financial catastrophe than households headed by males among the non-poor. Household income was not significant at the 5% level in any of the regressions.

Controlling for these variables, the incidence of catastrophic expenditure among the poor fell substantially from 1997 to 2000 but did not fall significantly after the removal of the user fees. Incidentally, this illustrates that simple comparisons of proportions can be misleading—the simple comparison reported earlier suggested that the incidence of catastrophic expenditure in the poor was significantly higher in 2003 than in 2000, but no statistically significant increase was apparent

Table 4
Coefficients in logistic regression for catastrophic expenditure (with catastrophic expenditure = 1)

	Poor				Non-poor			
	OR	Coef.	Std. Err.	$P > z$	OR	Coef.	Std. Err.	$P > z$
yr1997	2.802	1.030	0.197	0.000	1.364	0.311	0.100	0.002
yr2003	1.046	0.045	0.225	0.843	0.807	-0.215	0.100	0.032
pub	3.731	1.317	0.183	0.000	2.277	0.823	0.090	0.000
prv	5.777	1.754	0.180	0.000	2.748	1.011	0.084	0.000
use_inp	3.415	1.228	0.346	0.000	7.898	2.067	0.119	0.000
age65	1.689	0.524	0.209	0.012	1.357	0.305	0.112	0.006
male	1.096	0.092	0.181	0.611	0.792	-0.233	0.086	0.007
edu	1.417	0.348	0.180	0.053	1.609	0.476	0.093	0.000
urban	0.621	-0.476	0.305	0.118	0.447	-0.805	0.097	0.000
_cons		-5.198	0.276	0.000		-4.123	0.116	0.000
	Number of obs. = 4573				Number of obs. = 22,328			
	LR $\chi^2(7) = 182.6$				LR $\chi^2(7) = 680.9$			
	Log likelihood = -602.3				Log likelihood = -2730.9			
	$P = 0.000$				$P = 0.000$			

Note: Likelihood-ratio Chow test: LR $\chi^2 = 34.9$, $p = 0.0001$.

after adjusting for confounders. It is, however, still important to remember that it did not fall. For the non-poor, there was a slight, but insignificant, decrease in catastrophic expenditure from 1997 to 2000, while the decrease from 2000 to 2003 was relatively large and statistically significant.

Discussion

We first consider the implications of the results for Uganda, then for the wider debate on user fees. Before this, possible limitations of the study are considered. Firstly, out-of-pocket expenditure was recorded for a 1-month period in the surveys and catastrophic spending was based on expenditures reported in that month. It may well be possible for the non-poor to recover more quickly from a financial shock than the poor. This can only be explored with panel data which were unavailable for Uganda, but it suggests that we should be more concerned about financial catastrophe among the poor. Secondly, the quality of services in public facilities can be an important determinant of the choice of provider, but no information on quality, or indeed, the overall availability of services, was available from the surveys. Thirdly, the impact of changes in the financing or organization of health systems cannot be evaluated like a clinical trial, where all other factors are held constant for the duration of the study. Many factors change at the same time and it is a complex process to try to establish causality.

For example, real GDP per capita increased at an average annual rate of 5.7% between 1997 and 2003. This would have independently increased the demand for health services, although we tried to control for this by including household income as an explanatory variable in the utilization equations. The HIV/AIDS pandemic, important in Uganda as in the rest of sub-Saharan Africa, would also have increased the need to use health services over the total period independently of the abolition of fees (UNAIDS, UNICEF, & WHO, 2004). This is considered again subsequently.

Despite these qualifications, some important findings emerge. The abolition of user fees at public facilities made these services more accessible. Both poor and non-poor households used public facilities more in 2003 than they had in 2000, as suggested in the earlier studies (Burnham et al., 2004; Deininger & Mpuga, 2004; Nabyonga et al., 2005). However, our results add depth to those findings by showing that 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 evidence that the abolition of fees increased their demand for public services beyond the increase experienced in the earlier period.

This conclusion needs to be tempered by the evidence that although the incidence of HIV infections continued to rise during the entire period, the rate of increase slowed, which would have been reflected in a slowing in the rate of increase in the demand for health services. For the poor, however, the evidence is that they used public services substantially more after the abolition of fees, despite any reduction in the rate of AIDS transmission.

Holding other factors constant, such as the quality and availability of services in public and private facilities, economic theory suggests that lower cost services in the public sector would encourage a switch from private to public services—the substitution effect (Varian, 1999). 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 described earlier would have led to an increase in demand for private services although we controlled for this by including income as an explainer. Alternatively, there is evidence that the removal of fees meant that medicines were frequently unavailable at public facilities and some people might have decided to seek care at private facilities as a result (Ministry of Health Uganda, & WHO Country Office Uganda, 2004; Nabyonga et al., 2005; WHO Country Office Uganda, SIDA, & Ministry of Health Uganda, 2003). Other factors, such as a possible increase in the number of private providers, might also have played a role but it is not possible to be sure given the available data.

Catastrophic expenditure for the non-poor declined from 2000 to 2003, while it surprisingly remained at the same level for the poor. The frequent unavailability of drugs in the second period might have contributed to the latter effect by forcing patients at public facilities to purchase drugs from the private sector and encouraging people to go directly to the private sector as suggested above. Another possibility might be that informal payments in public facilities returned or increased to “compensate” providers for revenue lost from user fees (Burnham et al., 2004).

The abolition of user fees did, therefore, encourage more poor people to seek care at public facilities when they were ill. This reduced one important barrier to care. While the desired decrease in the proportion of poor households facing catastrophic health expenditures did not eventuate, at least the proportion did not increase. On balance, therefore, fee abolition had a positive impact on the poor.

These results have implications for the broader debate on user fees. The most important is that the effects of increases or decreases in user fees cannot be evaluated by assessing changes in utilization alone. We have shown that it is important to consider the impact on financial catastrophe arising from OOPs as well. For the Ugandan poor, the incidence of financial catastrophe

did not fall after fees were abolished, showing that a reduction in expenditure on fees can be offset by increases in payments for other services, particularly those that are no longer available in the public sector.

The practical lesson is that the elimination of fees can have unintended consequences, even in cases where government seeks to compensate districts for lost revenues. This is likely to be particularly relevant where existing user fees are retained at the health facility to replenish pharmaceutical stocks, provide financial incentives for staff or to upgrade infrastructure. Transfers from central government to the district would not be sufficient without developing a method to ensure that they actually flow to health facilities and compensate for the activities previously supported by fees.

The study also has implications for research design. Simple “before–after” designs focusing on utilization make it difficult to determine if observed changes are due to the policy on fees, or whether they simply continued earlier trends. In Uganda, the increase in utilization of public services by the non-poor after the abolition of fees was actually smaller than the increase observed in the period before their abolition, something that could not be observed in the earlier published studies using the “before–after” design. This can be countered by considering a longer time period for analysis and also by controlling for as many possible confounders as possible.

Conclusion

Poor households in Uganda, as in most African countries, still face difficult choices—do they seek care when they are ill knowing that the act of obtaining care can result in financial catastrophe, or do they forego care knowing that sustained ill health could reduce their ability to work and might lead to impoverishment? Health policy-makers also face difficult choices. Public sector health services are generally under-funded and in some settings user fees provide needed revenue at the facility level which is used to improve the availability or quality of services. Abolishing fees would result in some lost revenue but, other things being equal, abolition is also likely to improve access and reduce the incidence of catastrophic expenditure.

Other things, however, are rarely equal in the complex area of health system financing, and it is important to obtain as much evidence as possible about the consequences of abolishing fees in practice, rather than in theory, to guide policy development. Depending on how the revenue from fees was used beforehand, their elimination could increase or decrease utilization and the incidence of financial catastrophe.

It would be advisable, then, that where governments wish to eliminate user charges, they first examine

carefully what inputs and activities at health facilities rely on the revenue provided by fees. If funds are no longer available to purchase medication and small items of equipment, e.g., or to pay for renovations to health facilities and repairs of equipment, or to provide financial incentives to staff, some or all of the benefits of the fee reduction are likely to be lost. Governments will also need to be sure that they can raise some additional funding, although it will generally be a relatively small proportion of total health expenditure. More importantly, it will require them to ensure that the additional funds are actually used to replace the activities previously supported by fees at the facility level.

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