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ORIGINAL PAPER

The differences in characteristics between health-care users and non-users: implication for introducing community-based health insurance in Burkina Faso

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Abstract The purposes of this study are to describe the characteristics of different health-care users, to explain such characteristics using a health demand model and to estimate the price-related probability change for different types of health care in order to provide policy guidance for the introduction of community-based health insurance (CBI) in Burkina Faso. Data were collected from a household survey using a two stage cluster sampling approach. Household interviews were carried out during April and May 2003. In the interviewed 7,939 individuals in 988 households, there were 558 people reported one or more illness episodes; two-thirds of these people did not seek professional care. Health care non-users display lower household income and expenditure, older age and lower perceived severity of disease. The main reason for choosing no-care and self-care was 'not enough money'. Multinomial logistic regression confirms these observations. Higher household cash-income, higher perceived severity of disease and acute disease significantly increased the probability of using western care. Older age and higher price-cash income ratio significantly increased the probability of no-care or self-care. If CBI were introduced the probability of using western care would increase by 4.33% and the probability of using self-care would reduce by 3.98%. The price-related probability change of using western care for lower income people is higher than for higher income although the quantity changed is relatively small. In conclusion, the introduction of CBI might increase the use of medical services, especially for the poor. Co-payment for the rich might be necessary. Premium adjusted for income or subsidies for the poor can be considered in order to absorb a greater number of poor households into CBI and further improve equity in terms of enrolment. However, the role of CBI in Burkina Faso is rather limited: it might only increase utilisation of western health care by a probability of 4%.

Keywords Health services · Community-based health insurance · Burkina Faso · Demand · Price elasticity

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Introduction

The process of making decision for choosing health care can be complicated. The decision can be shaped by many factors such as the price and the quality of the health care available, the level of household-income, the patient's health status as well as a set of individual and household characteristics such as age, sex and education. This is, especially true in the African context, where the household head decides over the allocation of resources and is the one most often

making the final decision on whether to seek health care or not [10].

One way to identify the factors (determinants) is through health-care demand analysis. Orthodox consumer theory can be used to investigate the determinants while taking health care as one of the many goods for which individuals have their own preference [24]. The human capital approach, however, can also be applied to investigate the determinants. In this case health is treated as a variable stock and as a joint production good, requiring both the contribution of the individual (through time) and the consumption of other goods and services such as health care [17]. Consumers demand health because it is a consumption commodity that makes them feel better and because it is an investment commodity that can determine the amount of time available to them to a certain extent. In this article we treat the demand for health care within the human capital framework because, as mentioned before, in Burkina Faso the household head makes the final decision on seeking health care and in making this decision, he/she usually considers the household productive resources.

The economic factors contributing to the demand for medical services are income, prices and the value of the patient's time because they affect not only whether a patient will seek medical care but also the extent of the treatment once care is sought. Many studies have examined the relationship between family income and expenditure on medial care as well as the effect of income and of prices of medial services on use of care. They concluded that prices are important [13, 23]. In 1987, Sauerborn et al. [30] carried out one study in Burkina Faso and found the price elasticities of demand for public providers to be –0.79 (overall), –1.44 (low-income) and –0.12 (high-income). Gertler and Molyneaux found the price elasticities of demand for services provided by the health centre to be –1.09 (children) and –1.04 (adults) [14]. Other studies, however, report that price elasticities are very small (about –0.10 to 0.40) and sometimes they even observe a positive price effect, although mostly statistically insignificant [2, 15, 19, 25, 33].

The studies suggest that evidence on the price elasticity of health care demand is mixed. In general, health care demand is inelastic, although it is more elastic for vulnerable groups and ambulatory care. Burkina Faso is one of the poorest countries in the world. It is therefore assumed that reducing the price of health services can result in an increase in the demand for health care. Health insurance serves the function of 'reducing the price' as insured people enjoy free access to care or pay only a portion of the real price. Thus, the introduction of community-based health insurance (CBI) in Burkina Faso is expected to result in an increase in the demand for health care. Local health services are in fact characterised, as elsewhere in Sub-Saharan Africa, by low and inequitable utilisation and poor quality [4, 22, 28, 29, 32]. The observed low utilisation of health services is directly related to their high price in relation to the household income. Health care in Burkina Faso still imposes considerable financial costs on the users [30].

CBI is one tool of health system improvement for rural populations in low-income countries, particularly in Sub-Saharan Africa [3, 9]. Community members pool their resources to share the financial risks associated with the consumption of health care. They own the scheme and control its management, including the collection of premiums, the payment of health care providers, and the negotiation of the benefit package. Unlike private insurance, premiums paid by households are community rated and not based on individual risk assessments. CBI has the advantage of dissociating the time of payment from the time of use of services, which is clearly better adapted than user fees to the seasonal fluctuations of revenue experienced by rural households [31]. The government of Burkina Faso, in its recently published health plan, has also promoted community-based financing mechanisms to alleviate the health care financing crisis [6].

This study was part of a larger project on the control of tropical infectious diseases in Burkina Faso. CBI has been identified as one of the interventions for the control of tropical infectious diseases. In order to further evaluate the feasibility of introducing CBI, based on the previous feasibility studies [11, 12], we carried out this base-line survey. We aim to describe the characteristics of different health-care user groups, to explain their characteristics using a health care demand model (multinomial logistic regression), and to project price-related probability change of using different types of health care in order to assess potential changes in health-care seeking behaviours if CBI were introduced. In addition, this study sets the basis for comparing changes in utilisation of health services following the implementation of CBI in the future.

Methods

Study site

Burkina Faso has an estimated population of approximately 10.7 millions [37]. It is divided into 11

administrative health regions, which comprise 53 health districts overall, each covering a population of 200,000 to 300,000 individuals. Each health district has at least one hospital with surgical facilities [5]. The districts themselves are sub-divided into smaller areas of responsibility that are organised around either a hospital or a Centre de Santé et de Promotion Sociale (CSPS), the first-line health care facility. This study was carried out in the Nouna health district, specifically in a sub-portion of this region currently under demographic surveillance. The area includes the catchment zone of the Nouna hospital and that of four CSPS (Koro, Bourasso, Dara and Toni) covering in total about 60,000 individuals distributed in 7,340 households. The Nouna health district located in the north-west Burkina Faso is an area that is a dry orchard Savannah, populated almost exclusively by subsistence farmers of different ethnic groups. The town of Nouna is the economic and political centre of Kossi province. Within the town, transportation is better and health facilities are more conveniently located than in the rural areas. The people living in the town of Nouna have relatively higher education and income and shorter distance to health facilities compared to those living in the rural areas.

Household survey

The household included in the sample were identified from the demographic surveillance system that is carried out every two years, with vital events registrations carried out every three months since 1992 [27]. A two-stage cluster sampling procedure was used to select the households, with each household having the same probability of being selected. Overall, 990 households were selected, 606 in the rural area and 384 in the town of Nouna.

The survey gathered information on age, sex, occupation and marital status; income and expenditure; health status (acute and chronic diseases); and demand for health care including use of health services and choice of health provider. The six-month income was estimated using revenues from crop and cattle sale as well as all other cash income. Expenditure was estimated by summing up all expenses indicated by the household respondents, including those on health care.

A three-day workshop to train interviewers was organised one week before the survey. The interviewers came from the locality, spoke the local language, had middle school education, and had obtained interview experience in previous household surveys. The household survey was carried out during April and May 2003.

Approach to analysis

A multinomial logistic (MNL) regression model was used to analyse the factors that influence demand for health care. This model was used because the dependent variable, demand for health care, has more than two categories representing the different options an individual faces when falling ill, and we had individual-specific explanatory variables [16]. In this study, these options have been defined as no-care, self-care, traditional care (care provided by a traditional healer) and western care (western medial care at a health facility).

One of the limitations of a MNL is that it assumes the relative probabilities of alternatives to be constant, commonly known as 'the independence of irrelevant alternatives' or IIA assumption. However, this assumption can be tested empirically and as long as the model provides evidence of this assumption being held, MNL offers better opportunities for interpretation of results as the coefficients can be converted into relative risk ratio [16, 34]. An alternative model such as multinomial probit, which does not have any restrictive assumption like IIA, could have been used but as the focus of the paper was to understand the differences in characteristics of users and non-users, presenting the results in terms of relative risk ratio was deemed more attractive than doing it otherwise. A number of recent studies also use MNL [20, 26].

The explanatory variables were selected based on the study hypotheses, the relevant knowledge and the needs of the model. In Burkina Faso, the household head is the one to decide if and where health care is sought. Therefore, household head education, household six-month cash income and the price-cash income ratio (the ratio between the per-visit price of western medicine (covering the cost of drugs as well as consultation, hospitalisation, laboratory tests and transportation) and the six-month household cash income) have been included. We assume that individual characteristics, the nature of the disease, the perceived severity of the disease and the perceived quality of care also influence the decision of the household head. These variables include individual age, sex, years of schooling, marital states, living in Nouna town or not, household head or not; perceived severity of disease, perceived limitation imposed by disease, type of disease (acute or chronic) and distance to nearest health facility.

A novel feature of this study is the introduction in the model the price-cash income ratio. The choice is justified by the fact that in the district of Nouna,

government facilities are the only providers of western care, following national policy guidelines in setting the price for the services they offer. Therefore, like in other developing countries [15], not much variation in price can be observed. We call the model presented in this article a price-income ratio model. It is assumed that while selecting the type of health care, households may consider not only the absolute price for different types of care but also the relative economic burden for the whole household.

We expect that higher household head's education, higher household income, being married, living in Nouna town, higher severity of disease, acute disease, and being a household head all increase western care use. Higher price-income ratio, older age and longer distance to western care can reduce utilisation.

The multinomial logistic regression model can be expressed as follows.

$$\text{Prob}(Y=0) = \frac{e^{x\beta^{(0)}}}{1 + e^{x\beta^{(0)}} + e^{x\beta^{(1)}} + e^{x\beta^{(2)}}}$$

$$\text{Prob}(Y=1) = \frac{e^{x\beta^{(1)}}}{1 + e^{x\beta^{(0)}} + e^{x\beta^{(1)}} + e^{x\beta^{(2)}}}$$

$$\text{Prob}(Y=2) = \frac{e^{x\beta^{(2)}}}{1 + e^{x\beta^{(0)}} + e^{x\beta^{(1)}} + e^{x\beta^{(2)}}}$$

$$\text{Prob}(Y=3) = \frac{1}{1 + e^{x\beta^{(0)}} + e^{x\beta^{(1)}} + e^{x\beta^{(2)}}}$$

where, Y = outcome category, types of health care, 'Y=0' is no-care, 'Y=1' is self-care, 'Y=2' is traditional care, and 'Y=3' is western medical care. $\beta^{(0)}$, $\beta^{(1)}$, and $\beta^{(2)}$ are a set of coefficients, correspond to each outcome category. X is a set of explanatory variables.

In the analysis, we used 'western medical care' as the reference category because CBI would only cover western medial care if it were introduced. Therefore, we want to know the possible changes from 'no-care' to 'western medical care', from 'self-care' to 'western medical care' and from 'traditional care' to 'western medical care'.

We intended to study the health care use conditional on a 'reporting illness' group. Compared to the full sample, selection bias may occur because the group might be a restricted, non-random sample. To investigate whether conditional estimates suffer from selection bias, we employed a probit model with sample selection [33] and found the correlation between error terms to be insignificant ($\text{Chi}^2(1) = 0.63$; P-value = 0.4256), ruling out any possibility of sample selection bias.

Price-related probability change of using different types of health care

We estimated the price-related probability change (the magnitude of the proportionate change in probability over the proportionate change in price) by income quartiles. First, we set the value of each variable at its average level, used the coefficients of variables resulting from the multinomial logistic regression model to estimate the probability of using a different type of health care before introducing CBI. Second, we calculated the new average value of the price-cash income ratio under the assumption that if people enrolled in CBI, the price of western care (except transportation) for the enrolees will be 'reduced' from the current level to zero. Then, we set the value of all other variables at their original average levels and used the same methodology to estimate the probability of using a different type of health care if CBI were introduced. Last, based on the probability change and the price change, we estimated the price-related probability change.

Correlation test

To explore the correlation between type of health care sought and household and individual characteristics, we run a non-parametric correlation test. For the test, we assumed that western medical care was better than traditional healer's care, traditional healer's care was better than self-care and self-care was better than no-care.

Results

Out of the 990 randomly selected households, 988 were included in the analysis (two had moved elsewhere) for a total of 7,939 individuals. 281 individuals experienced an acute disease in the month previous to the interview. 900 individuals suffered from a chronic disease and 137 individuals had a disability. In the study, we only recorded health service utilisation for the individuals with acute diseases and for individuals with chronic diseases who gave rise to acute symptoms or signs in the month previous to the interview. This left 558 cases available for health service utilization analysis. Rest of individuals who were not ill were included in the descriptive analysis.

General characteristics of the whole sample

The mean household size was 8.04. The mean household six-month cash income was 215,417 CFA and expenditure 176,083 CFA, €329 and €269 respectively. The population was young with an average age of 22 years. 48.13% of the whole sample was children under 15 years of age and 50.69% were males. 35.75% of the population were married at the time of the interview. Education, measured by years of schooling, was very low with an illiteracy rate of 82.87% (Table 1).

Characteristics of health care users and non-users

In total, 558 individuals reported at least one illness episode. Of those, 19.71% used western medical care, 10.75% traditional healer's care, 52.51% self-care and 17.03% no-care (Table 2). We only analysed the first visit because the second and third visits were very few. Out of 558 individuals, only 11 people reported a second visit, and three people a third one.

A statistically significant correlation between the type of health care sought and some of the characteristics was observed (Table 2). Household income and expenditure, living in Nouna town, and perceived severity of disease had a significant positive correlation with the type of health care sought from no-care to western medical care. Age had a significant negative correlation. All correlations observed had the hypothesized signs.

The main reason for choosing no-care and self-care was 'not enough money' while that for choosing traditional care and western care was 'trusting'. 'Near home' and 'severity of disease' were indicated as the second and third reasons for choosing western care (Table 2).

The average age in the full sample was 22.03 years old and in the group reporting illness was 30.15 (Table 1, 2). This suggests that those who were sick were substantially older than the general population. Out of 558 'sick' persons, only 16.8% of them were below 5 years old.

The multinomial logistic regression model is valid. It passed the chi^2 test and has a value of R^2 of 0.273. It also passed Hausman IIA (independence from irrelevant alternatives) test [18]. In the model of no-care versus western care, almost all-explanatory variables had the hypothesized signs. Only distance to the nearest health facility contradicted the hypothesized sign, but the variable was not statistically significant. Higher household cash-income, living in Nouna town, being a household head, higher perceived severity of the disease and acute disease significantly increased the probability of using western care. Older age and higher price-cash income ratio, however, significantly increased the probability of no-care (Table 3).

In the model of self-care versus western care, all explanatory variables including distance to the nearest health facility had the hypothesized signs. Higher household cash-income, married and higher perceived severity of disease significantly increased the probability of using western care. Older age and higher

Table 1 Household and individual characteristics of the whole sample

Characteristics	Mean (SD)	Median	Minimum	Maximum
Household[a]				
Size	8.04 (5.89)	7.00	1	57
<=15 years old size	3.87 (3.36)	3.00	0	27
6-month cash income[b]	215,417 (442,536)	105,000	0	10,414,750
6-month expenditure[b]	176,083 (435,205)	93,750	0	10,863,954
Living in Nouna town (%)	36.23			
Individual[c]				
Age	22.03 (19.03)	16.00	0	101
Sex (male, %)	50.69			
Married (%)	35.75			
Years of schooling	0.83 (2.20)	0.00	0	22
6-month cash income[b]	25,670 (131,978)	0.00	0	8,410,000
6-month expenditure[b]	21,273 (136,849)	0.00	0	10,034,954
Living in Nouna town (%)	34.73			

[a] 988 households have been interviewed

[b] CFA (€1 = 655 CFA)

[c] There are 7939 individuals in total

Table 2 Household, individual and other characteristics of health care users and non-users

Characteristics	No-care	Self-medication	Traditional care	Western care	Total/average	Spearman R[c]
Sample size (%)	95 (17.03)	293 (52.51)	60 (10.75)	110 (19.71)	558	
Household						
Household size	9.73	11.08	9.57	11.44	10.76	0.039
Education (years)						
0 (%)	83 (87.37)	260 (88.74)	54 (90.00)	90 (81.82)	487 (87.28)	
>0 (%)	12 (12.63)	33 (11.26)	6 (10.00)	20 (18.18)	71 (12.72)	
6-month cash income[a]	132,124	208,547	261,803	723,230	302,723	0.196**
6-month expenditure[a]	133,227	175,099	241,649	429,953	225,366	0.192**
Individual						
Age	36.96	28.69	32.33	26.95	30.15	–0.108*
Sex (male, %)	0.47	0.43	0.52	0.49	0.46	0.030
Married (%)	0.65	0.46	0.48	0.53	0.51	–0.059
Household head (%)	0.23	0.21	0.25	0.24	0.22	0.015
Education (years)						
0 (%)	86 (90.53)	251 (85.67)	51 (85.00)	89 (80.91)	477 (85.48)	
>0 (%)	9 (9.47)	42 (14.33)	9 (15.00)	21 (19.09)	81 (14.52)	
6-month cash income[a]	35,767	30,737	21,409	60,293	36,417	0.036
6-month expenditure[a]	31,079	27,228	22,563	59,644	33,772	0.030
Living in Nouna town (%)	0.21	0.29	0.38	0.41	0.31	0.142**
Others						
Perceived severity of disease	1.55	1.78	2.03	2.06	1.82	0.245**
Perceived limitation imposed by disease	3.79	3.57	2.90	3.18	3.46	0.075
Number of episodes in past month	1.07	1.08	1.05	1.03	1.06	–0.045
Perceived quality of CSPS[b]	3.37	3.23	3.66	3.53	3.36	0.063
Perceived quality of healer	2.96	2.91	3.09	2.81	2.92	–0.018
Cost per visit[a]	0	474	1,163	4,399	1,241	0.630**
Distance to the nearest health facility (km)	5.87	6.31	5.43	4.79	5.84	–0.075
Main reasons for choosing the treatment						
Not enough money (%)	44 (46.32)	182 (62.12)	20 (33.33)	4 (3.64)	250 (44.80)	
Not severe (%)	17 (17.89)	0 (0.00)	0 (0.00)	0 (0.00)	17 (3.05)	
Trusting (%)	0 (0.00)	79 (26.96)	33 (55.00)	62 (56.36)	174 (31.18)	
Near home (%)	0 (0.00)	1 (0.34)	0 (0.00)	22 (20.00)	23 (4.12)	
Severe (%)	0 (0.00)	0 (0.00)	1 (1.67)	21 (19.09)	22 (3.94)	
Others (%)	34 (35.79)	31 (10.58)	6 (10.00)	1 (0.91)	72 (12.90)	

[a] CFA (€1 = 655 CFA)

[b] The first line health facility (Western medicine)

[c] Spearman's non-parametric correlation test between types of health-care seeking (non-care = rank 0, self-medication = rank 1, traditional care = rank 2, Western care = rank 3 and each of the characteristics * $P < 0.05$ and > 0.01, ** $P < 0.01$

price-cash income ratio significantly increased the probability of self-care (Table 3).

In the model of traditional care versus western care, almost all-explanatory variables had the hypothesized signs. Perceived severity of disease didn't have the hypothesized sign but was also not significant. Higher perceived limitation imposed by the disease and acute disease significantly increased the probability of using western care. The economic variables, however, did not significantly influence the choice for the type of health-care (Table 3).

Price-related probability changes and their implications for introducing CBI

The projected probability of using different types of health care is related to household income (Table 4). No-care had a negative relation with income. All others (self-care, traditional care and western care), however, had a positive relation with income. The projected probability of using no-care and self-care would decrease and that of using professional care (traditional and western care) would increase if CBI

Table 3 Results of multinomial logistic regression

	Independent variable and description	B	S. E.	Sig.	Exp (B)
No-care versus western care	Intercept	3.0254	0.6740	0.0000	
	Household head education (literate = 1)	–0.1121	0.4659	0.8099	0.8940
	Household 6-month cash income[a]	–0.000002	0.0000	0.0179	1.0000
	Price per visit for western care/household 6-month cash income	2.4830	1.2006	0.0386	11.9777
	Age	0.0324	0.0105	0.0021	1.0329
	Marital status (married = 1)	–0.3427	0.3930	0.3831	0.7098
	Living in Nouna town (yes = 1)	–0.8924	0.4231	0.0349	0.4097
	Household head (yes = 1)	–1.1600	0.4497	0.0099	0.3135
	Perceived severity of disease	–1.3729	0.2936	0.0000	0.2534
	Perceived limitation imposed by disease	–0.0724	0.1272	0.5690	0.9301
	Distance to the nearest health facility (km)	–0.0150	0.0274	0.5850	0.9852
	Type of disease (acute = 1, chronic = 0)	–1.2506	0.3505	0.0004	0.2863
Self-care versus western care	Intercept	2.4205	0.5401	0.0000	
	Household head education (literate = 1)	–0.3865	0.3337	0.2468	0.6795
	Household 6-month cash income[a]	–0.0000004	0.0000	0.0451	1.0000
	Price per visit for western care/household 6-month cash income	2.5516	1.1788	0.0304	12.8271
	Age	0.0178	0.0089	0.0456	1.0179
	Marital status (married = 1)	–0.6468	0.3202	0.0434	0.5237
	Living in Nouna town (yes = 1)	–0.2432	0.3198	0.4470	0.7841
	Household head (yes = 1)	–0.6506	0.3684	0.0774	0.5217
	Perceived severity of disease	–0.6404	0.2034	0.0016	0.5271
	Perceived limitation imposed by disease	–0.0467	0.0983	0.6351	0.9544
	Distance to the nearest health facility (km)	0.0174	0.0214	0.4172	1.0175
	Type of disease (acute = 1, chronic = 0)	–0.1940	0.2621	0.4592	0.8237
Traditional care versus western care	Intercept	0.7795	0.7468	0.2966	
	Household head education (literate = 1)	–0.5635	0.5283	0.2861	0.5692
	Household 6-month cash income[a]	–0.0000004	0.0000	0.1731	1.0000
	Price per visit for western care/household 6-month cash income	1.0827	1.6343	0.5076	2.9528
	Age	0.0117	0.0116	0.3113	1.0118
	Marital status (married = 1)	–0.6889	0.4342	0.1126	0.5021
	Living in Nouna town (yes = 1)	–0.0047	0.4576	0.9917	0.9953
	Household head (yes = 1)	–0.4524	0.5076	0.3729	0.6361
	Perceived severity of disease	0.1842	0.2793	0.5097	1.2022
	Perceived limitation imposed by disease	–0.2746	0.1403	0.0504	0.7599
	Distance to the nearest health facility (km)	0.0091	0.0311	0.7692	1.0092
	Type of disease (acute = 1, chronic = 0)	–1.7165	0.3987	0.0000	0.1797
Sample size	544				
LR chi^2 (33)	155.16				
(*P* value)	(0.0000)				
Pseudo R^2	0.248 (Cox and Snell), 0.273 (Nagelkerke), 0.119 (McFadden)				

[a] CFA (€1 = 655 CFA)

were introduced. The average increased probability of using western care was 4.33% and the average reduced probability of using self-care was 3.98%.

According to the CBI implementation plan [11], services included in the benefit package will be provided to enrolees free of charge. Still enrolees will pay for transportation and for services not included in the package. The benefit package, however, will cover 95% of the total cost of care (according to information from this survey). This would result in an average price-related probability change of using western care of –0.2864 (Table 4). There are small variations across income groups. In the projection, considering the standard errors of the independent variables, the price-related probability change for CBI enrolees is around –0.0009 to –0.8218 at the 95% confidence interval.

Discussion

This is one of the few studies looking at health care demand and health service utilisation in Burkina Faso and using a multinomial logistic regression to identify

Table 4 The projected probability of choosing health-care types if community-based health insurance (CBI) were introduced

	Household cash income[a]				Total
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
Projected probability before CBI					
No-care	0.2769	0.2604	0.2295	0.0923	0.2024
Self-care	0.5162	0.5255	0.5421	0.5944	0.5558
Traditional care	0.0770	0.0785	0.0812	0.0908	0.0835
Western care	0.1299	0.1356	0.1472	0.2225	0.1584
Projected probability after CBI					
No-care	0.2620	0.2458	0.2157	0.0845	0.1895
Self-care	0.4842	0.4919	0.5053	0.5396	0.5159
Traditional care	0.0866	0.0881	0.0908	0.0988	0.0930
Western care	0.1672	0.1742	0.1882	0.2770	0.2016
Projected probability difference					
No-care	–0.0149	–0.0146	–0.0138	–0.0078	–0.0129
Self-care	–0.0320	–0.0336	–0.0368	–0.0548	–0.0398
Traditional care	0.0096	0.0096	0.0096	0.0081	0.0095
Western care	0.0372	0.0385	0.0410	0.0545	0.0433
Price-related probability change					
No-care	0.0565	0.0586	0.0629	0.0885	0.0668
Self-care	0.0649	0.0670	0.0712	0.0966	0.0751
Traditional care	–0.1313	–0.1287	–0.1237	–0.0932	–0.1190
Western care	–0.3005	–0.2976	–0.2919	–0.2569	–0.2864

[a] Quartile 1 is the lowest income level and quartile 4 is the highest income level

the characteristics of health care users and non-users [29, 30, 32]. Our findings suggested that two-thirds of all ill individuals did not seek professional care (traditional and western medical care). Most people only resorted to self-care. Based on the actual and projected probabilities of using different types of health care before introducing CBI, it is found that if they sought professional care, western medicine would be their main choice. Non-users of professional health-care (no-care and self-medication) displayed lower household income and expenditure, older age and lower perceived severity of disease. Economic factors strongly influenced people's choice between professional care and non-professional care. Once the choice to seek professional care was made, however, economic factors no longer influenced the choice between traditional care and western care. The reason is not clear. People may consider the nature of the disease as a more important determinant than the price. The price-related probability change of using western care in the lower income group is higher than in higher income one, but the quantity changed is relatively small across all income groups.

Our findings with regard to a small price-related probability change of using western care if CBI were introduced suggest that price is not the only important determinant of medical care utilisation. The results are supported by other studies conducted in developing countries [2, 19, 21, 25, 33]. These studies indicate that other factors, such as quality of services and public transport, may play a greater role than price. Household use of health facilities is sensitive to the quality of the health care available, thus improving the quality of service delivery may be one cost-effective way to raise utilisation rate [8]. Improving the quality of public services may prove to be a more valuable intervention than simply lowing price when attempting to increase health service utilisation [1].

In addition, the projected difference in the use of health services if CBI were introduced is consistent with what results Waters describes when looking at different utilisation rates among the enrolled and the non-enrolled of the seguro campesino social programme [36], a programme which provides voluntary health insurance for agricultural workers in rural Ecuador and which has similar characteristics to CBI. Waters estimates that the difference in utilisation rates ranges from 2.46 to 3.43%. Similarly, looking at the effect of insurance membership among farmers in rural Senegal, Jütting observed that membership bore a strong positive effect on the probability of going to a hospital, even though the magnitude, with a higher probability of 2% points, was quite moderate [21]. The results of both studies are very close to the findings of this study, which suggests an increase in western care utilisation ranging from 3.72 to 4.33%.

As far as the methodology is concerned, the novel feature of this study is the introduction in the model of the price-cash income ratio as one of the explanatory variables rather than the use of the price of health care alone. To our knowledge, very few studies used this variable. Most of the studies have used both income and price [1, 7, 25, 30]. The advantage of using the price-cash income ratio rests in its potential to increase

variation within the variable. In most developing countries, governments set the prices for health services and therefore prices across health facilities are often the same and/or display very little variation. If the constant price or the price with little variation were used in the health demand model, the effect of the price variable on the demand for health care would not be reflected completely.

This study is policy-oriented. As mentioned earlier, the results can be used as the base for comparing changes in health service utilisation after implementing CBI. The results can also help us address additional concerns, such as if the demand for medical care is price sensitive or not, and if a co-payment policy is needed or not.

The difference in the changes of price-related probability of using western care between the poor (–0.30) and the rich (–0.26) implies that the introduction of CBI, resulting in a reduction of the price can increase the use of medical care, especially for the poor. After enrolling in CBI, the poor will increase their utilisation of western care more than the rich, implying that CBI can improve equity in terms of access to and use of western care. The introduction of a co-payment policy for the rich may be necessary because of their relatively smaller price-sensitivity. Thus, more revenues for CBI could be generated and at the same time over-use of western care could be limited.

A careful evaluation of the changes in the utilisation patterns if CBI were introduced will provide guidance for subsequent policies, such as setting adequate co-payment levels. Introducing income-adjusted premiums could be considered as a policy option given the special price-sensitivity of this group. Thus, more poor households could be absorbed into CBI and equity in terms of enrolment could be further enhanced. In addition, CBI not only increases healthcare utilisation but also offers a valuable tool towards the financial protection of poor population against the cost of illness [21].

Finally, further studies will be needed to answer several questions related to the political and economic decisions around CBI. For example, what will be the long-term and short-term consequences of not building up CBI, but increasing quality by direct sponsorship of health centres? What measures would be used to increase the enrolment of the poor if they were not able to afford the premium given CBI were a political and economic choice? To which extent the utilization and quality would reach so that we could declare the success or failure of CBI? We cannot answer these questions in this study because it only assesses the potential changes in health-care seeking behaviours if CBI were introduced.

Conclusion

The introduction of CBI might increase the use of medical services, especially for the poor. Introducing co-payments for the rich might be necessary because of their relatively lower price-sensitivity. Income-adjusted premiums or subsidies for the poor can be considered in order to absorb more poor households into CBI and further improve the equity impact of the programme. However, the role of CBI in Burkina Faso is rather limited, it might only increase utilisation of Western health care by a probability of 4%.

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