Parmar, D., Allegri, M.D., Savadogo, G. & Sauerborn, R. (2013). Do community-based health insurance schemes fulfil the promise of equity? A study from Burkina Faso. Health Policy and Planning, 29(1), pp. 76-84. doi: 10.1093/heapol/czs136

Published by Oxford University Press in association with The London School of Hygiene and Tropical Medicine
Health Policy and Planning 2014;**29**:76–84
doi:10.1093/heapol/czs136

Do community-based health insurance schemes fulfil the promise of equity? A study from Burkina Faso

Divya Parmar,[1,2]* Manuela De Allegri,[2] Germain Savadogo[3] and Rainer Sauerborn[2]

[1]LSE Health, London School of Economic and Political Science, Houghton Street, London, UK, [2]Institute of Public Health, Heidelberg University, Heidelberg, Germany and [3]Center de Recherche en Sante de Nouna, Nouna, Burkina Faso

*Corresponding author. Institute of Public Health, INF 324, Heidelberg University, Heidelberg, Germany 69120.
E-mail: d.parmar1@lse.ac.uk.

Accepted 10 December 2012

Objective: To examine whether the community-based health insurance (CBHI) scheme in Burkina Faso has been effective in providing equitable healthcare access to poor individuals, women, children and those living far from health facilities.

Methods: We used the Nouna Health District Household Survey to collect panel data on 990 households during 2004–08. By applying a series of random effects regressions and using concentration curves, we first studied determinants of CBHI enrolment and then assessed differences in healthcare utilization between members and non-members. We studied differences with regard to rich and poor, men and women, children and adults and those living far vs those living close to health facilities.

Findings: With regard to enrolment, we found that poor (odds ratio [OR] = 0.274) and children (OR = 0.456) were less likely to enrol while gender and distance were not significantly correlated to enrolment. In terms of utilization, poor (coefficient = 0.349), women (coefficient = 0.131) and children (coefficient = 0.190) with CBHI had higher utilization than the group without CBHI. We also found that there was no significant difference in utilization between members and non-members if they were living far from health facilities.

Conclusion: The CBHI scheme in this case was only partially successful in achieving the equity objectives. This study advises policy makers in Burkina Faso and elsewhere, who see CBHI schemes as a silver bullet to achieve universal health coverage, to be mindful of the chronically low enrolment rates and more importantly the lack of equity across the various groups that this study has highlighted.

Keywords Equity, Africa, health insurance, gender, distance, age, poverty

KEY MESSAGES

- Community-based health insurance schemes do not necessarily achieve equity in healthcare access, even when the poor are given premium subsidies.
- Distance to health facilities is a key barrier to healthcare utilization that affects the vulnerable populations the most. Community-based health insurance schemes that do not cover transportation costs, fail to remove this barrier.
- From a policy prospective, before community-based health insurance schemes are used to further the objective of universal health coverage, the equity effects of these schemes must be closely analysed.

Introduction

Universal healthcare coverage (UHC) has been defined as a situation where the whole population of a country has access to appropriate healthcare services when they need it and at an affordable cost (Carrin *et al*. 2005). Although UHC has gained considerable momentum in the international community and has also found inroads into the policy discussions of many low- and middle-income countries (LMIC), there is no consensus on how countries should move forward. UHC can be financed through tax or through contributory insurance schemes, and organized through one national scheme or a number of different schemes (Nitayarumphong 1998). Care should be taken that the objective of equity, which is inherent in the definition of UHC, is upheld. Equity of overall arrangements is the extent to which the different sources of financing are pooled and services provided on the basis of need, irrespective of income, residency or sociocultural factors.

Gwatkin and Ergo (2011) rightly caution that universal coverage is much more difficult to achieve than to advocate. LMIC face enormous challenges of financial constraints, limited human resources and weak health infrastructure (Schneider *et al*. 2000). Against this background, some advocate that these countries should try to leverage on existing models to provide UHC (Carrin *et al*. 2005; Jacobs *et al*. 2008). This viewpoint has gained ground in sub-Saharan Africa (SSA) where several community-based health insurance (CBHI) schemes exist. In West Africa alone, there were 585 CBHI schemes in 2003 (Bennett 2004). These schemes have different designs but are generally described as 'voluntary, non-profit insurance schemes, formed on the basis of an ethic of mutual aid, solidarity and collective pooling of health risks, in which the members participate effectively in its management and functioning' (Atim 1998). Since voluntary community-based or cooperative insurance historically played an important role in the evolution of European and Japanese universal coverage arrangements (Criel and Waelkens 2003; Ogawa *et al*. 2003), it is argued that a similar approach could be followed by some SSA countries. Considering these schemes target the informal and poor populations, an approach based on integrating them into a national framework promises equity (Jacobs *et al*. 2008).

Although CBHI schemes are appealing to the equity objective of UHC, except for the cases of Rwanda (Schneider *et al*. 2000) and Ghana (Baltussen *et al*. 2006), they currently occupy only a minor role in the wider endeavour of achieving UHC in SSA. One of the foremost reasons is that their effectiveness needs to be proven in practice. A review by (Baeza *et al*. 2002) that included 258 such schemes concluded that there is over-concentration on issues of enrolment and financial sustainability while only few have assessed their equity-enhancing role. Moreover, inequities may not only be influenced entirely by financial factors but also by social and cultural factors, such as the inability of women to travel alone outside the home, or reach facilities from villages not connected by roads. Current literature on equity, apart from being limited, focuses primarily on differences across economic groups (Annear *et al*. 2011). Differences with regard to gender, age and distance receive less importance, although they have been widely found to act as barriers to healthcare utilization. Franco *et al*. (2008) note how a CBHI scheme in Mali increased financial access to primary health services. They also found that distance was a significant negative predictor for healthcare utilization. Cases from Taiwan (Kreng and Yang 2011), Ghana (Chankova *et al*. 2010), Kenya (Chuma and Okungu 2011), Uganda (Orem and Zikusooka 2010), Nigeria (Uzochukwu *et al*. 2008), South Korea (Lu *et al*. 2007), Indonesia (Erlyana *et al*. 2011) and China (Fang *et al*. 2010) also show that there is significant inequity in healthcare utilization between urban and rural populations primarily because of concentration of resources in urban areas. Ranson *et al*. (2003) found that the CBHI scheme in Karnataka, India, which covered transportation costs, increased utilization and geographic equity. Previous studies from Burkina Faso have also found that age too affects healthcare access. People in their productive years, 16–60 years, were found to access medical care more often than children (Sauerborn *et al*. 1996; Pokhrel *et al*. 2010).

Burkina Faso like other SSA countries is at the crossroads of developing a strategy for UHC and is currently debating whether it should integrate existing CBHI schemes into a national health insurance plan. By studying the equity enhancing effect of one such scheme, we not only fill a gap in evidence but also add to this current policy debate. Moreover, we present a holistic picture of equity in CBHI by encompassing the barriers created by not only poverty but also gender, distance and age. We present equity at two levels: enrolment and healthcare utilization.

Methodology

CBHI scheme

A CBHI scheme, Assurance Maladie à Base Communautaire (AMBC), was introduced in the Nouna Health District (NHD), located ~300 km from the country capital Ouagadougou, following a clustered-randomized control design in 2004. The whole region, consisting of 41 villages and Nouna town, was divided into 33 clusters and every year 11 additional clusters were offered AMBC. From 2006 onwards, the whole region was offered AMBC. This process is described in detail elsewhere (De Allegri *et al*. 2008).

Enrolment was voluntary. To limit adverse selection, the unit of enrolment was set as a household and a 3-month waiting period was enforced. Although the unit of enrolment was the household, the premium was set at the individual level: 1500 CFA (2.29€) for an adult and 500 CFA (0.76€) for a child (<15 years old). The premium for the entire household was paid in one instalment, at the beginning of the year, after the harvest. Membership had to be renewed yearly. The benefit package included a wide range of first- and second-line medical services available within the NHD. The insured were asked to seek care at a pre-assigned first-line facility and only if referred could access the District Hospital in Nouna. Both out-patient services at the first-line facility and up to 15 days of inpatient care at the District Hospital were covered. Essential and generic medicines offered in these facilities were also covered. There were no co-payments, deductibles or ceilings on the benefits.

Equity has always been a key concern for the AMBC team. To encourage enrolment of children, from the start, premium for a child was kept lower than for an adult. De Allegri *et al*. (2006) investigated the reasons for this low enrolment and found that

the poor were enrolling less because they could not afford the premium. Later, Dong *et al*. (2009) studied the reasons for high drop-outs in AMBC and concluded that the poor found it difficult to pay the premiums. Based on these two studies, the premium was reduced by half for the poorest 20% of households starting in 2007. Hence, the poor households had to pay a premium of 750 CFA for an adult and 250 CFA for a child. Poor households were identified by a community wealth-ranking exercise conducted every 2 years, already described by Souares *et al*. (2010).

Data and variables

Data were obtained from the NHD Household Survey (NHDHS), a panel survey conducted in a sub-portion of NHD under the demographic surveillance. The original sample of 990 households (~7900 individuals) was selected by a two-stage cluster sampling design in 2003. Data were collected on demographic and socioeconomic indicators, self-reported morbidity, healthcare seeking behaviour and AMBC membership. NHDHS is described by De Allegri (2008). We used data from years 2004 to 2008. We included only those individuals who were offered AMBC in a particular year.

To assess socioeconomic status (SES), we used an asset-based index, as asset ownership tends to fluctuate less than income or expenditures (Kolenikov and Angeles 2009). Principal component analysis (Garenne and Hohmann-Garenne 2003) was used to derive SES indices for each household by combining household ownership of durable goods (bicycle, television, radio, fridge, bike, car, cart, plough and stove), livestock (poultry, goat, sheep, cow, donkey and horse) and housing characteristics (number of rooms, quality of walls and roof). For regressions, SES status was captured by a binary variable, where households in quartile 1 (Q1: lowest 25%) were defined as 'poor' and the rest as 'rich'.

Data description and variable definitions are presented in Table 1. From 2004 to 2008, 2000 individuals were lost to follow-up. Individuals offered AMBC increased from 2004 to 2006 as AMBC was offered to more villages. On average 4.9% individuals enrolled into AMBC every year, which included re-enrolees as well as new enrolees. Every year, on an average, 22.1% individuals reported being sick and 4.9% individuals were enrolled in AMBC. Enrolment was higher in 2007; the year premium subsidies were introduced. Percentage of children decreased while adults increased as the panel became older. Almost 40% of the individuals were literate. Most (86.5%) were engaged in agriculture or livestock rearing. 37.2% of the individuals lived more than 5 km from any public health facility. According to the SES categories, 25% of the households lie in Q1. However, we find that these 25% households make up only 13.3% of the individuals in our sample. This is because Q1 is determined at the household level and average household size in Q1 was much smaller than in other quartiles; therefore, Q1 had fewer individuals compared with other quartiles.

Measures of equity

Equity in enrolment and utilization were assessed using two indicators—concentration curves (CC) and regressions. CC and regressions complement each other. Although regression *tests* for the presence of inequity, CC quantifies the *extent* of inequity. In this analysis, we used random effects (RE) regressions to take advantage of the panel nature of the sample, i.e. repeated observations.

The CC plots the cumulative proportion of the outcome variable (y-axis) against the cumulative proportion of the sample, ranked by SES, beginning with the poorest (x-axis). Concentration index (CI) is twice the area between the CC and the line of equality (45°). CI ranges from −1 to 1. A negative CI means concentration among the poor (i.e. CC lies above the equality line), and a positive CI reflects concentration among the rich (i.e. CC lies below the equality line). CI of zero means equal distribution among all SES groups (Gwatkin *et al*. 2005).

Equity in enrolment

To test equity in enrolment, we estimated an RE logit model to determine whether the vulnerable groups—poor, women, children and those living far from health facilities—have a higher odds of enrolling compared with rich, men, adults and those living near health facilities respectively. To complement this analysis, we also estimated CCs and CIs to determine the extent to which inequity in enrolment reduced after the introduction of premium subsidies to the poor.

Equity in utilization

AMBC covered medical care only at the public facilities; hence, utilization was limited to these facilities. The analysis was restricted to only sick individuals for whom the utilization information was collected.

We estimated RE logit model to assess whether SES, gender, age, distance and AMBC enrolment were associated with utilization. To evaluate whether insured poor (women, children or those living far) were utilizing healthcare more than the uninsured poor (women, children or those living far), we also estimated RE regressions with interaction terms. For these regressions, we applied linear probability models, as we want to include interaction terms without losing a lot of sample, as would be the case with logit models. To study the differences depending on AMBC status, SES and gender (age or distance), CC and CI were also estimated.

In all regressions, individual and household characteristics like household size, ethnicity, education and occupation, which could affect enrolment and utilization, were controlled. Year dummies, that capture year shocks (e.g. inflation and drought) affecting all individuals, were also included. To control for intra-household correlation, robust standard errors were calculated.

Results

Equity in enrolment

Table 2, column 1, presents the RE logit results for equity in enrolment. Poor individuals (odds ratio [OR] = 0.274) and children (OR = 0.456) were less likely to enrol than rich and adults, respectively. Individuals engaged in agriculture (OR = 0.310) were less likely to enrol also because they were associated with lower SES status. There was no significant association of gender and distance to enrolment. Literate individuals (OR = 1.974) and individuals from larger

Table 1 Description of the data and variable definitions

Variables	Definition	2004	2005	2006	2007	2008	Overall
n	No. of individuals	6827	6334	5725	5517	4824	—
Eligible	No. of individuals offered AMBC	2878	4360	5725	5517	4824	—
Sick	Reported sick in the recall period[a]	18.3	25.7	22.5	22.5	21.9	22.1
Insurance							
AMBC	1 if insured; 0 otherwise[b] (%)[c]	4.4	4.6	4.1	6.3	4.9	4.9
Sex							
Male	1 if male; 0 otherwise[b] (%)	51.6	52.0	52.2	52.9	53.2	52.3
Age							
Age 15	Age 15 years or less (%)	44.1	42.2	40.4	38.4	36.1	40.6
Age 16–60	Age between 16 and 60 years[b] (%)	49.2	51.1	52.2	53.7	55.0	52.0
Age 61	Age 61 years or older (%)	6.7	6.7	7.4	7.9	8.9	7.4
Education							
Literate	1 if can read/write; 0 otherwise[b] (%)	32.1	36.3	41.0	44.2	49.4	39.9
Occupation							
Agri	1 if employed in Agriculture/livestock; 0 otherwise[b] (%)	87.9	88.2	86.0	86.0	83.9	86.5
Household size							
Size	No. of individuals in the household	11.9	11.1	12.2	12.4	11.1	11.7
SES							
Poor	1 if household in SES quartile 1; 0 otherwise[b] (%)	13.2	12.7	13.7	13.8	13.1	13.3
Ethnicity							
Bwaba	1 if Bwaba; 0 otherwise[b] (%)	22.6	22.9	22.8	23.7	22.7	22.9
Distance							
Near	≤5 km to nearest health facility; 0 otherwise[b] (%)	58.9	59.0	65.6	66.8	65.8	62.8
Year							
2004	Year 2004[b] (%)						23.4
2005	Year 2005 (%)						21.7
2006	Year 2006 (%)						19.6
2007	Year 2007 (%)						18.9
2008	Year 2008 (%)						16.5

[a]Recall period: 1 month prior to the survey date.

[b]Reference category for regression.

[c]These numbers correspond to the insured individuals covered by the household survey. The population enrolment rates were 4.5%, 5.0%, 3.9%, 6.1% and 5.2% for years 2004–08.

households (OR = 1.027) were more likely to enrol. Enrolment increased significantly after 2004 (except 2006), with year 2007 recording the greatest increase (OR = 2.775).

Figure 1 shows the CCs, before and after subsidies were offered to the poor households. Both the CCs are below the line of equality, implying that enrolment is inequitable throughout 2004–08. However, the fact that the CC for 2007–08 (CI = 0.148, SE = 0.024) is closer to the line of equality than the CC for 2004–06 (CI = 0.413; SE = 0.019) implies that the proportion of poor enrolees increased after premium subsidies were introduced.

Equity in utilization

In Table 2, column 2, RE logit results for equity in healthcare utilization are shown. AMBC was associated with increased utilization (OR = 2.182). Children (OR = 0.565) and poor (OR = 0.499) were associated with low utilization compared with adults and rich, respectively. Those who lived near a health facility (OR = 1.454), literate individuals (OR = 1.545) and individuals from larger households (OR = 1.016) had higher utilization. Utilization was not associated with gender, ethnicity or occupation.

Table 3 reports the RE results for equity in healthcare utilization with interaction terms. Column 1 shows the difference in utilization depending on SES and AMBC status. Compared with poor without AMBC (reference category), poor with AMBC had higher utilization (coefficient = 0.349). Rich without AMBC and as expected rich with AMBC also had higher utilization than poor without AMBC. Column 2 presents the difference in utilization depending on gender and AMBC status. Compared with women without AMBC (reference category), utilization was higher among women with AMBC. There was no difference in utilization between men and women who did not enrol. Column 3 presents the difference in utilization depending on age and AMBC status. Utilization was higher among children with AMBC as compared to

Table 2 Results for equity in enrolment and healthcare utilization

Variables	Column 1		Column 2	
	Enrolment		Healthcare utilization[a]	
	OR	SE	OR	SE
AMBC	—	—	2.182	0.531***
Age (years)				
≤15	0.456	0.132***	0.565	0.175*
60+	1.277	0.384	1.120	0.208
Gender				
Male	0.886	0.187	0.876	0.130
Distance				
Near (≤5 km)	0.985	0.197	1.454	0.212**
SES				
Poor	0.274	0.090***	0.499	0.115***
Ethnicity				
Bwaba	0.961	0.235	1.155	0.183
Education				
Literate	1.974	0.403***	1.545	0.230***
Household size				
Size	1.027	0.011**	1.016	0.009*
Occupation				
Agri	0.310	0.062***	1.110	0.211
Year				
2005	1.792	0.436**	0.904	0.231
2006	0.890	0.216	0.723	0.181
2007	2.775	0.644***	0.826	0.212
2008	1.524	0.366*	0.733	0.185
No. of observations	15228		1710	
No. of individuals	4695		1263	
Log likelihood (LL)	−1926.06		−837.199	
LL ratio test (*P* value)	1471.33 (0.000)		0.43 (0.000)	
Wald χ^2 (*P* value)	119.87 (0.000)		55.16 (0.000)	

Dependent variable: AMBC status binary variable.
[a]Only individuals who reported being sick were included in the analysis.
***1%, **5% and *10% significance levels.

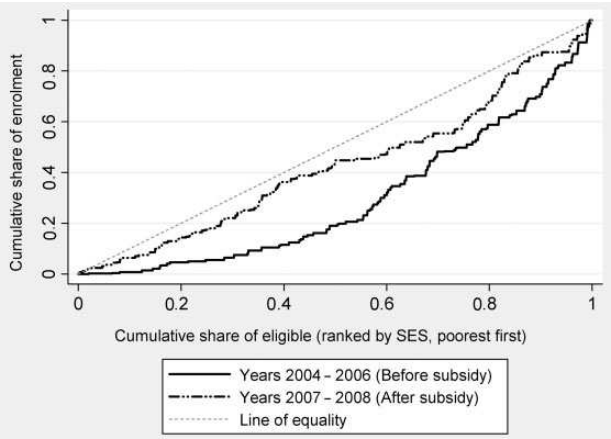

Figure 1 CCs for enrolment, before and after subsidy.

children without AMBC (reference category). Column 4 presents the difference in utilization depending on distance and enrolment. It shows that there is no significant difference in utilization levels for AMBC and non-AMBC individuals if they lived far from health facilities. However, those that lived near (both AMBC and non-AMBC groups) had higher utilization as compared with those that lived far.

Figure 2 shows CCs to compare the utilization among AMBC and non-AMBC for women (and men), children (and adults) and those living far (and those living near) health facilities. Utilization was more equitable among women with AMBC (CI = −0.119, SE = 0.118) than among women without AMBC (CI = 0.095, SE = 0.034). The CC for AMBC is clearly above the line of equality and also above the CC for non-AMBC for almost 70% of the poorest women. For men, inequity in utilization existed for both AMBC (CI = 0.205, SE = 0.089) and non-AMBC (CI = 0.119, SE = 0.032) groups. In fact, for the richest 70%, utilization was higher among men without CBHI than among men with AMBC.

With regard to age, equity was better among insured (CI = −0.027, SE = 0.152) than uninsured (CI = 0.130, SE = 0.054) children. For the poorest 40% of children, CC for AMBC was above the CC for non-AMBC and also above the line of equality, implying a pro-poor effect of CBHI for children. For adults, utilization was better among the insured (CI = 0.091, SE = 0.085) than uninsured (CI = 0.105, SE = 0.026) for the poorest 40% adults. For the richest 60%, adults without AMBC had slightly higher utilization than adults with AMBC.

Looking at distance, those living near a health facility and with AMBC had almost equitable utilization with CI = 0.030 (SE = 0.075), especially among the poorest 60%. For those living far from a health facility, utilization was inequitable for both AMBC (CI = 0.484, SE = 0.131) and non-AMBC (CI = 0.158, SE = 0.042) groups and inequity was even worse among those with AMBC.

Discussion

As countries like Burkina Faso decide on the right mix of financing arrangements to attain universal coverage they must ensure that the vulnerable groups like the poor, women, children, elderly and those living in remote areas are included. Whether the current network of CBHI schemes can offer an effective way to include these vulnerable groups is debatable. So far, the experience with CBHI has been mixed. CBHI schemes have been shown to increase healthcare access (Atim 1999; Jakab and Krishnan 2001; Jütting 2004) and provide financial protection (Ranson 2002; Jowett *et al*. 2003) to its members. Beyond these benefits, few have also reported positive effects on health status (Aggarwal 2010), quality of care at health facilities (Schneider *et al*. 2000), household assets (Parmar *et al*. 2011) and empowerment (Michielsen *et al*. 2010). However, there are several studies that have shown that while CBHI provides coverage to populations that otherwise would have no financial protection, benefits have not reached the most vulnerable groups (McPake *et al*. 1993; Atim 1998; Jütting 2001).

In this study, we assessed equity at two levels: enrolment and healthcare utilization. We looked at differences across economic status, gender, age and distance. Although we found that

Table 3 Results for equity in healthcare utilization, with interaction terms

Variables	Column 1		Column 2		Column 3		Column 4	
	SES × AMBC		Gender × AMBC		Age × AMBC		Distance × AMBC	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Age (years)								
≤15	−0.063	0.030**	−0.063	0.030**	—	—	−0.063	0.030**
60+	0.012	0.026	0.013	0.026	—	—	0.014	0.026
Gender								
Male	−0.016	0.021	—	—	0.009	0.016	−0.015	0.021
Distance								
Near (≤5 km)	0.048	0.019**	0.049	0.019***	0.055	0.016***	—	—
SES								
Poor	—	—	−0.076	0.022***	−0.080	0.018***	−0.077	0.022***
Ethnicity								
Bwaba	0.025	0.022	0.024	0.022	0.023	0.018	0.023	0.022
Education								
Literate	0.061	0.022***	0.060	0.022***	0.036	0.043**	0.060	0.022***
Household size								
Size	0.002	0.001*	0.002	0.001*	0.002	0.001	0.002	0.001*
Occupation								
Agriculture	0.017	0.026	0.016	0.026	—	—	0.017	0.026
Year								
2005	−0.014	0.039	−0.014	0.039	0.001	0.030	−0.012	0.039
2006	−0.043	0.037	−0.043	0.037	−0.037	0.029	−0.042	0.037
2007	−0.025	0.038	−0.023	0.038	−0.030	0.030	−0.024	0.038
2008	−0.046	0.037	−0.043	0.037	−0.030	0.030	−0.044	0.037
Poor × AMBC[a]								
Poor with AMBC	0.349	0.178**	—	—	—	—	—	—
Rich without AMBC	0.083	0.022***	—	—	—	—	—	—
Rich with AMBC	0.198	0.056***	—	—	—	—	—	—
Women × AMBC[a]								
Women with AMBC	—	—	0.131	0.079*	—	—	—	—
Men without AMBC	—	—	−0.016	0.021	—	—	—	—
Men with AMBC	—	—	0.127	0.071*	—	—	—	—
Child × AMBC[a]								
Children with AMBC	—	—	—	—	0.190	0.087**	—	—
Adults without AMBC	—	—	—	—	0.061	0.017***	—	—
Adults with AMBC	—	—	—	—	0.233	0.054***	—	—
Far × AMBC[a]								
Far with AMBC	—	—	—	—	—	—	0.054	0.081
Near without AMBC	—	—	—	—	—	—	0.044	0.019**
Near with AMBC	—	—	—	—	—	—	0.215	0.067***
No. of observations	1710		1710		1710		1710	
No. of individuals	1263		1263		1263		1263	
Rho	0.080		0.085		0.068		0.085	
Wald χ^2 (P value)	62.42 (0.000)		59.65 (0.000)		86.06 (0.000)		59.77 (0.000)	

Dependent variable: Utilization binary variable (only public health facilities covered by AMBC were considered) and only individuals who reported being sick were included.

[a]Reference categories for the interaction terms: poor without AMBC; women without AMBC; children without AMBC and far without AMBC.

***1%, **5% and *10% significance levels.

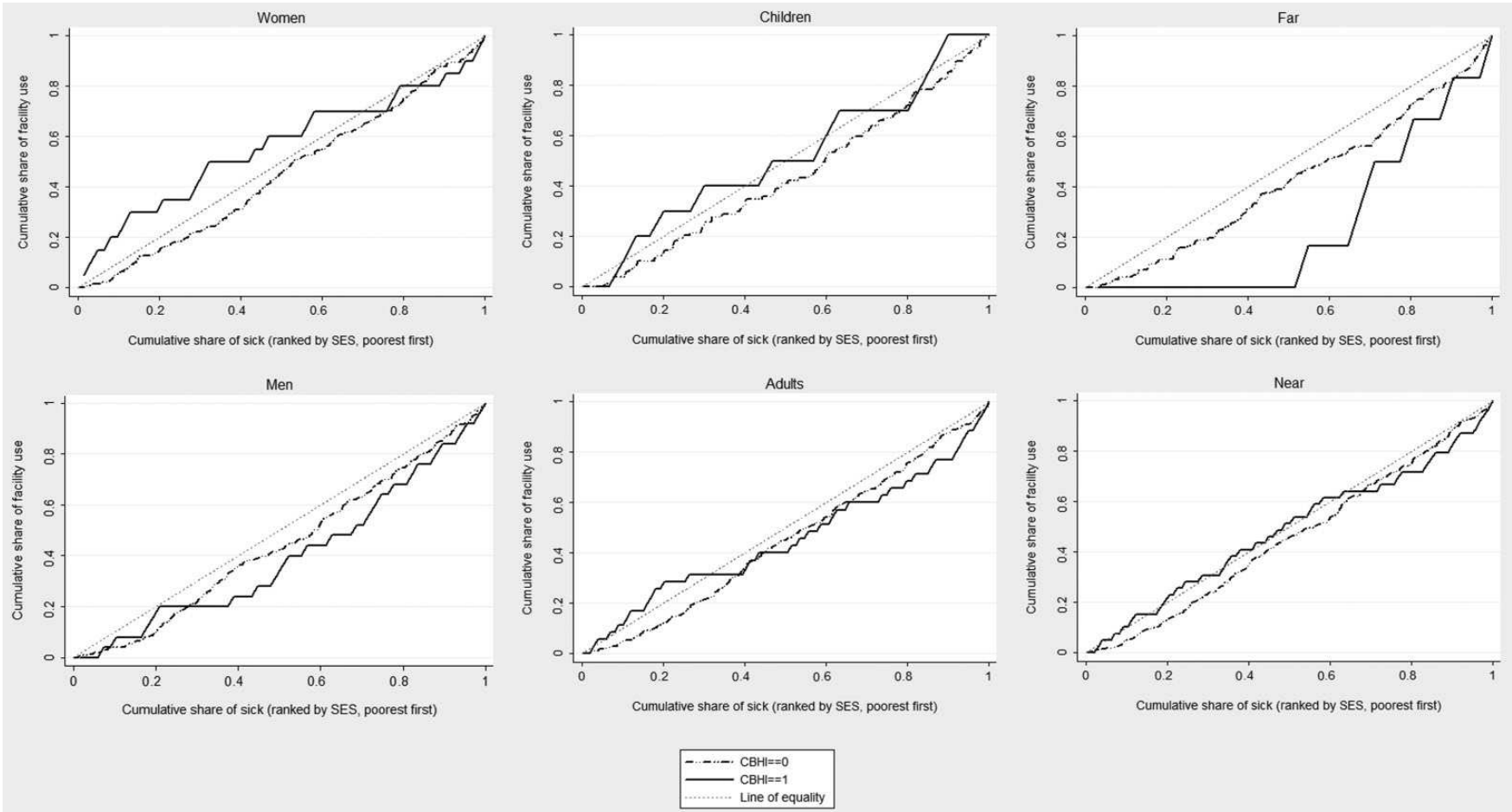

Figure 2 CCs to compare the extent of inequity depending on AMBC and SES status with regard to gender, age and distance.

enrolment among poor significantly increased after subsidy, they were still less likely to enrol compared with the rich. However, the poor who enrolled had higher utilization than those who did not. Gender and age were not found to be key determinants of enrolment but women and children with CBHI had higher healthcare utilization. This correlation was found to be even stronger among poor households.

Our results are in line with other studies conducted in the NHD. Gnawali *et al*. (2009) found that CBHI increased the use of outpatient services but this effect was observed only for the rich households. Similarly a qualitative study by De Allegri *et al*. (2006) concluded that the premiums were felt to be unaffordable by the poor households, comparable with the results of the study by Dong *et al*. (2009) who found that high premiums deterred poor households from renewing their membership. Unlike our study based on period 2004–08, the earlier studies on AMBC were cross-sectional. Moreover, the earlier studies looked at equity in utilization only with regard to economic categories. Our study adds to earlier analyses as we examine differences in enrolment and utilization not only with regard to economic status but also with regard to gender, age and distance to health facilities.

In our analysis, we found that CBHI was ineffective at removing the distance barrier towards healthcare utilization. Even with CBHI, individuals living far from health facilities were less likely to utilize healthcare. The failure of CBHI in removing distance as a barrier to utilization has been reported previously (Preker and Carrin 2004). Distance is crucial because many poorer households are clustered in remote areas that lack adequate health infrastructure.

It is important to mention that health protection mechanisms such as CBHI can only be effective to a certain extent. To promote equity in healthcare access health infrastructure, quality of care, roads and public transport need to be improved in parallel. Options such as covering transport costs (e.g. Yashaswini scheme in India) have been shown to achieve greater distance equity (Aggarwal 2010). Further research can be conducted on whether this practice can be imported to the African context.

Taking the discussion on enrolment further, we find that with an overall enrolment rate of below 6% over 4 years, any positive effects of the scheme are marginal from a national perspective. Problems of low enrolments are not unique to AMBC. Majority of the CBHI schemes have reported enrolment rates below 10% (Ekman 2004; Waelkens *et al*. 2005; Baltussen *et al*. 2006; Soors *et al*. 2010). In particular, low enrolment among the poor has also been consistently identified as an issue across other schemes (Preker 2005; Asante and Aikins 2008; Bruce *et al*. 2008; Jehu-Appiah *et al*. 2011). Unless enrolment rates are significantly increased, the potential of CBHI schemes in lending support to the equity objective of universal health coverage is largely unrealized.

To conclude, this study cautions policy makers in Burkina Faso and elsewhere who see CBHI schemes as a silver bullet to achieve UHC. They should be mindful of the chronically low enrolments rates and more importantly the lack of equity across the various groups that this study has highlighted. In particular, we would like to underline the distance aspect, which is often neglected.

Acknowledgements

The views expressed in this paper are those of the authors. The authors thank Dr. Aurélia Souares and the Center de Recherche en Sante de Nouna for their valuable support during the data collection process. This project was approved by the Ethics Committee of the Faculty of Medicine, Heidelberg University, Germany (D2 project under 130/2002) and by the Nouna Research Ethics Committee in Nouna, Burkina Faso (2005-005/CLE/CRSN).

Funding

This work was supported by the collaborative research grant Sonderforschungsbereich (SFB) 544 of the German Research Society (Deutsche Forschungsgemeinschaft).

Conflict of interest statement

None declared.

References

Aggarwal A. 2010. Impact evaluation of India's 'Yeshasvini' community-based health insurance programme. *Health Economics* **19**(Suppl):5–35.

Annear PL, Bigdeli M, Jacobs B. 2011. A functional model for monitoring equity and effectiveness in purchasing health insurance premiums for the poor: evidence from Cambodia and the Lao PDR. *Health Policy* **102**: 295–303.

Asante F, Aikins M. 2008. *Does the NHIS Cover the Poor*? [Online]. Accra: Danida Health Sector Support Office paper. http://moh-ghana.org/UploadFiles/nhis/NHIS%20pro-poor%20research090805112429.pdf, accessed 31 July 2011.

Atim C. 1998. Contribution of mutual health organizations to financing, delivery, and access to health care. *Synthesis of Research in Nine West and Central African Countries*. Bethesda, MD: Abt Associates Inc.

Atim C. 1999. Social movements and health insurance: a critical evaluation of voluntary, non-profit insurance schemes with case studies from Ghana and Cameroon. *Social Science and Medicine* **48**: 881–96.

Baeza C, Montenegro R, Nunez M. 2002. *Extending Social Protection in Health through Community Based Health Organizations: Evidence and Challenges*. Geneva, Switzerland: International Labour Organization, STEP Unit, Discussion Paper.

Baltussen R, Bruce E, Rhodes G *et al.* 2006. Management of mutual health organizations in Ghana. *Tropical Medicine and International Health* **11**: 654–9.

Bennett S. 2004. The role of community-based health insurance within the health care financing system: a framework for analysis. *Health Policy and Planning* **19**: 147–58.

Bruce K, Narh-Bana SA, Agyepong A. 2008. *Community Satisfaction, Equity in Coverage and Implications for Sustainability of the Dangme West Health Insurance Scheme*. Dodowa, Ghana: Ghanaian-Dutch Collaboration for Health Research and Development. Project Number 2001/GD/08. Technical Report Series No. 9.

Carrin G, James C, Evans DB. 2005. *Achieving Universal Health Coverage: Developing the Health Financing System. Technical brief for policy-makers*. Geneva, Switzerland: WHO.

Chankova S, Atim C, Hatt L. 2010. Ghana's National Health Insurance Scheme. In: Escobar, Griffin, Shaw (ed.). *Impact of Health Insurance in Low- and Middle-Income Countries*. Washington, DC: The Brookings Institution.

Chuma J, Okungu V. 2011. Viewing the Kenyan health system through an equity lens: implications for universal coverage. *International Journal for Equity in Health* **10**: 22.

Criel B, Waelkens MP. 2003. Declining subscriptions to the Maliando Mutual Health Organisation in Guinea-Conakry (West Africa): what is going wrong? *Social Science and Medicine* **57**: 1205–19.

De Allegri M, Kouyate B, Becher H *et al.* 2006. Understanding enrolment in community health insurance in sub-Saharan Africa: a population-based case-control study in rural Burkina Faso. *Bulletin of the World Health Organization* **84**: 852–8.

De Allegri M, Pokhrel S, Becher H *et al.* 2008. Step-wedge cluster-randomised community-based trials: an application to the study of the impact of community health insurance. *Health Research Policy and Systems* **6**: 10.

Dong H, De Allegri M, Gnawali D *et al.* 2009. Drop-out analysis of community-based health insurance membership at Nouna, Burkina Faso. *Health Policy* **92**: 174–9.

Ekman B. 2004. Community-based health insurance in low-income countries: a systematic review of the evidence. *Health Policy and Planning* **19**: 249–70.

Erlyana E, Damrongplasit KK, Melnick G. 2011. Expanding health insurance to increase health care utilization: will it have different effects in rural vs. urban areas? Health Policy **100**: 273–81.

Fang P, Dong S, Xiao J *et al.* 2010. Regional inequality in health and its determinants: evidence from China. *Health Policy* **94**: 14–25.

Franco LM, Diop FP, Burgert CR *et al.* 2008. Effects of mutual health organizations on use of priority health-care services in urban and rural Mali: a case-control study. *Bulletin of the World Health Organization* **86**: 830–8.

Garenne M, Hohmann-Garenne S. 2003. A wealth index to screen high-risk families: application to Morocco. *Journal of Health, Population and Nutrition* **21**: 235–42.

Gnawali DP, Pokhrel S, Sie A *et al.* 2009. The effect of community-based health insurance on the utilization of modern health care services: evidence from Burkina Faso. *Health Policy* **90**: 214–22.

Gwatkin DR, Ergo A. 2011. Universal health coverage: friend or foe of health equity? *The Lancet* **377**: 2160–61.

Gwatkin DR, Wagstaff A, Yazbeck A (eds). 2005. *Reaching the Poor with Health, Nutrition and Population Services: What Works, What Doesn't and Why*. Washington, DC: World Bank.

Jacobs B, Bigdeli M, Pelt MV *et al.* 2008. Bridging community-based health insurance and social protection for health care—a step in the direction of universal coverage? *Tropical Medicine and International Health* **13**: 140–3.

Jakab M, Krishnan C. 2001. *Community Involvement in Health Care Financing: Impact, Strengths and Weaknesses: A Synthesis of Literature*. HNP Discussion Paper. Washington, DC: World Bank.

Jehu-Appiah C, Aryeetey G, Spaan E *et al.* 2011. Equity aspects of the National Health Insurance Scheme in Ghana: who is enrolling, who is not and why? *Social Science and Medicine* **72**: 157–65.

Jowett M, Contoyannis P, Vinh ND. 2003. The impact of public voluntary health insurance on private health expenditures in Vietnam. *Social Science and Medicine* **56**: 333–42.

Jütting JP. 2001. *The Impact of Health Insurance on the Access to Health Care and Financial Protection in Rural Areas of Developing Countries: The Example of Senegal*. Bonn, Germany: Center for Development Research.

Jütting JP. 2004. Do community-based health insurance schemes improve poor people's access to health care? Evidence from rural Senegal. *World Development* **32**: 273–88.

Kolenikov S, Angeles G. 2009. Socioeconomic status measurement with discrete proxy variables: is principal component analysis a reliable answer? *Review of Income and Wealth* **55**: 128–65.

Kreng VB, Yang C-T. 2011. The equality of resource allocation in health care under the National Health Insurance System in Taiwan. *Health Policy* **100**: 203–10.

Lu JF, Leung GM, Kwon S *et al.* 2007. Horizontal equity in health care utilization evidence from three high-income Asian economies. *Social Science and Medicine* **64**: 199–212.

McPake B, Hanson K, Mills A. 1993. Community financing of health care in Africa: an evaluation of the Bamako initiative. *Social Science and Medicine* **36**: 1383–95.

Michielsen JJA, Meulemans H, Soors W *et al.* 2010. Social protection in health: the need for a transformative dimension. *Tropical Medicine and International Health* **15**: 654–8.

Nitayarumphong S. 1998. Universal coverage of health care: challenges for the developing countries. In: Nitayarumphong S, Mills A (eds). *Acheiving Universal Coverage of Health Care. Office of Health Care Reform*, Nonthaburi: Ministry of Public Health.

Ogawa S, Hasegawa T, Carrin G, Kawabata K. 2003. Scaling up community health insurance: Japan's experience with the 19th century Jyorei scheme. *Health Policy and Planning* **18**: 270–8.

Orem J, Zikusooka C. 2010. Health financing reform in Uganda: how equitable is the proposed National Health Insurance scheme? *International Journal for Equity in Health* **9**: 23.

Parmar D, Reinhold S, Souares A *et al.* 2011. Does community-based health insurance protect household assets? Evidence from rural Africa. *Health Services Research* **47**: 819–39.

Pokhrel S, De Allegri M, Gbangou A, Sauerborn R. 2010. Illness reporting and demand for medical care in rural Burkina Faso. *Social Science and Medicine* **70**: 1693–700.

Preker AS. 2005. *Spending Wisely: Buying Health Services for the Poor*. Washington, DC: World Bank Publications.

Preker AS, Carrin G (eds). 2004. *Health Financing for Poor People: Resource Mobilization and Risk Sharing*. Washington, DC: World Bank.

Ranson MK. 2002. Reduction of catastrophic health care expenditures by a community-based health insurance scheme in Gujarat, India: current experiences and challenges. *Bulletin of the World Health Organization* **80**: 613–21.

Ranson MK. 2003. Community-based health insurance schemes in India: a review. *National Medical Journal of India* **16**: 79–89.

Sauerborn R, Berman P, Nougtara A. 1996. Age bias, but no gender bias, in the intra-household resource allocation for health care in rural Burkina Faso. *Health Transition Review* **6**: 131–45.

Schneider P, Diop F, Bucyana S. 2000. *Development and Implementation of Prepayment Schemes in Rwanda*. Technical Report. Partnership for Health Reform Project. Bethesda, MD: Abt. Associates Inc.

Soors W, Devadasan N, Durairaj V, Criel B. 2010. *Community Health Insurance and Universal Coverage: Multiple Paths, Many Rivers to Cross*. World Health Report 2010, Background Paper 48. Geneva, Switzerland: World Health Organization.

Souares A, Savadogo G, Dong H *et al.* 2010. Using community wealth ranking to identify the poor for subsidies: a case study of community-based health insurance in Nouna, Burkina Faso. *Health & Social Care in the Community* **18**: 363–68.

Uzochukwu BS, Onwujekwe EO, Onoka CA, Ughasoro MD. 2008. Rural-urban differences in maternal responses to childhood fever in South East Nigeria. *PLoS One* **3**: e1788.

Waelkens MP, Soors W, Criel B. 2005. *The Role of Social Health Protection in Reducing Poverty: the Care of Africa*. Geneva: International Labour Organization.