Research

Understanding enrolment in community health insurance in sub-Saharan Africa: a population-based case–control study in rural Burkina Faso

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Objective To identify factors associated with decision to enrol in a community health insurance (CHI) scheme.
Methods We conducted a population-based case–control study among 15 communities offered insurance in 2004 in rural Burkina Faso. For inclusion in the study, we selected all 154 enrolled (cases) and a random sample of 393 non-enrolled (controls) households. We used unconditional logistic regression (applying Huber–White correction to account for clustering at the community level) to explore the association between enrolment status and a set of household head, household and community characteristics.
Findings Multivariate analysis revealed that enrolment in CHI was associated with Bwaba ethnicity, higher education, higher socioeconomic status, a negative perception of the adequacy of traditional care, a higher proportion of children living within the household, greater distance from the health facility, and a lower level of socioeconomic inequality within the community, but not with household health status or previous household health service utilization.
Conclusion Our study provides evidence that the decision to enrol in CHI is shaped by a combination of household head, household, and community factors. Policies aimed at enhancing enrolment ought to act at all three levels. On the basis of our findings, we discuss specific policy recommendations and highlight areas for further research.

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يمكن الاطلاع على الملخص بالعربية في صفحة 857.

Introduction

Community health insurance (CHI) is receiving increased attention as a means of health financing in low- and middle-income countries. In countries with limited ability to develop and sustain national health insurance programmes, CHI has emerged as a valuable alternative to user fees since, by pooling risks and resources at the community level, it promises to ensure better access to health services and greater financial protection against the costs of illness for traditionally excluded and disadvantaged populations.[1–3]

In practice, however, CHI often falls short of achieving its potential, primarily because it fails to secure satisfactory levels of participation.[4–7] Although the inability to secure satisfactory enrolment rates among target populations remains a major concern across all low- and middle-income countries,[4,8–10] the problem assumes acute proportions in sub-Saharan Africa, where schemes rarely attain 10% coverage among target populations.[7] For this reason, they often cease to exist within a few years of their inception.[4,7,11]

Although the problem of low enrolment has long dominated the policy debate, rigorous scientific evaluations of the factors affecting the decision to enrol in CHI in sub-Saharan Africa are still very scarce.[6,12] While several studies have documented voluntary health insurance experiences in Asia,[8,10,13–16] only a limited number of evaluations have explored the factors influencing the decision to enrol or not to enrol in CHI in sub-Saharan countries.[17–19] The literature on CHI in sub-Saharan Africa has long been dominated by consultancy reports, which have focused on assessing the managerial and financial capacity of existing schemes rather than systematically exploring the factors motivating or discouraging enrolment.[20–23] Understanding the reasons behind low enrolment rates is therefore a relevant research question.

Our study aimed to identify factors shaping the decision to enrol in CHI in a population-based study applying a case–control methodology. We hypothesized that the decision to enrol in CHI was shaped by a combination of household head, household and community characteristics. The study was conducted in the Nouna Health District, Burkina Faso, in 2004.

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Methods

Research setting

The Nouna Health District is located in the northwest of the country, about 300 km from the capital, Ouagadougou. A CHI scheme was initiated there at the beginning of 2004. The aim is to set up a district-wide scheme by progressively offering CHI to all the villages of the district and to all sectors of the district capital, the town of Nouna. Our study is limited to those parts of the district — 12 villages and 3 town sectors — in which the first enrolment campaign took place between February and May 2004. The insurance product on offer was identical across the 15 communities. The unit of enrolment was the household. The yearly premium amounted to 1500 CFA francs (US$ 3) for each adult and 500 CFA francs (US$ 1) for each child (less than 15 years of age). The benefit package included a wide range of first-line and second-line services that were available at the health facilities within the district. It excluded reimbursement for all traditional healing practices. Decisions regarding the services that should be included and those that should be excluded from the benefit package were guided by the results of a study which explored community preferences for such a package prior to the implementation of the scheme. This study and details of the benefit package are described in detail elsewhere.[24,25] Depending on their geographic location, villages and town sectors were designated to receive primary care either at one of five rural first-line facilities or at the urban first-line facility located on the premises of the district hospital. If referred, all patients were entitled to receive secondary care at the district hospital.

Participants

Fig. 1 illustrates the sampling procedure. By means of a demographic surveillance system (DSS), we ascertained that 3125 households resided in the study area, and from the CHI records that 154 of these 3125 households (4.9%) had enrolled in CHI. We sampled all 154 households as cases. As controls, we included all 393 non-enrolled households already selected for a routine panel survey conducted in the study area twice a year.[26] These households had been randomly selected for inclusion in the panel survey following a two-stage sampling procedure described elsewhere.[26]

Survey tools and variables

We administered to all study participants (cases and controls) the household survey questionnaire routinely adopted in the study area.[26] We collected information on CHI enrolment status, socioeconomic conditions, self-reported morbidity and health-care seeking behaviour. Given that households did not have a choice with regard to how much insurance to purchase, i.e. how many family members to enrol in CHI, we treated the decision to enrol as a discrete choice problem yielding a binary outcome, enrolment versus non-enrolment.

We incorporated in the analysis a measure of how household heads perceived the adequacy of traditional healing practices in treating common conditions because we assumed that such perceptions would influence the decision to enrol in CHI. We supposed that those who perceived the care provided by traditional healers to be adequate would also be the least likely to enrol, as they would consider that traditional medicine represents a valuable substitute for the modern medical services contracted by the CHI scheme. We asked household heads to rate on a scale from 1 to 5 the adequacy of the care delivered by traditional healers and then differentiated between household heads who judged such care to be "adequate" (values 1 and 2) and household heads who judged it to be "mediocre/inadequate" (values 3 to 5).

We measured socioeconomic status in terms of the aggregate household expenditure over six months.[27] As an indicator of health status, we counted the overall number of chronic diseases reported in a household, differentiating households with at least one chronic disease from those with no chronic disease. As an indicator of prior curative as well as preventive health service use, we counted the overall number of curative and preventive visits to health facilities in the previous 12 months, differentiating households with at least one visit from households with no visit.

Imitating an approach previously adopted to assess the impact of community-level socioeconomic inequality on health status,[28,29] we calculated the expenditure of the poorest 50% of households as a percentage of the overall community six-month expenditure within each of the 15 communities included in our study. Then we grouped communities into three categories: high level of inequality, middle level of inequality and low level of inequality. We measured overall participation in risk-sharing by calculating, again within each community, the percentage of the adult population already participating in a formal or semi-formal risk-sharing arrangement other than CHI.

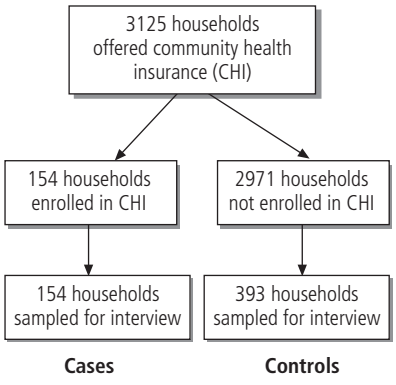
Given that the case–control nature of our sample could have biased such estimates, we derived both community-level indicators from data collected during the previous round of the routine panel survey[26] which was conducted in 2003, shortly before the launch of the CHI scheme, and exclusively on a representative population sample (unpublished data). Local informants, such as community leaders and the president of the largest local risk-sharing confederation, were asked to comment on the adequacy of our methodological choice. Judging that conditions had hardly changed between 2003 and 2004, they confirmed that we could safely incorporate in our analysis community-level estimates obtained from the previous round of the panel survey.

Data analysis

First, within the limits of the information available through the DSS, we checked that the households selected as controls were representative of the overall non-enrolled population in the study area. We did so by comparing the controls and the overall non-enrolled population with regard to the basic sociodemographic characteristics included in the DSS: household size, and household head's age, sex and ethnicity.

Second, we explored bivariate relationships between the outcome variable, i.e. enrolment in CHI, and the single

Fig. 1. **Details of the sampling scheme used in the study**



household head, household, and community characteristics.

Third, we used multivariate unconditional logistic regression to control for possible confounding and to estimate the strength of the association between enrolment status and all the household head, household and village characteristics. To account for potential clustering at the community level, we applied Huber–White correction estimates.

Findings

We were able to interview 137 out of 154 enrolled (cases) and all 393 non-enrolled (controls) households.

Table 1 compares basic sociodemographic information for the controls included in our sample with that for the non-enrolled population in the study area. No remarkable differences were observed between the two groups, indicating that the controls were representative of the overall non-enrolled population.

Table 2 (web version only, available from: http://www.who.int/bulletin) summarizes the basic characteristics of the study population of enrolled and non-enrolled households. No significant differences between the two groups existed with regard to household head age and sex, and household health status and prior household use of preventive health services. In comparison with controls, cases were more likely to belong to the Bwaba ethnic group, were more likely to be employed outside the farming sector, and were more likely to fall into the wealthier categories. Median six-month expenditure was 219 400 CFA francs (US$ 420) and 82 500 CFA francs (US$ 160) among enrolled and non-enrolled households, respectively. Cases also differed from controls in that they were more likely to have rated traditional care as "mediocre/inadequate", to have used curative health services, to live far from the health facility, and to live in communities with low levels of socioeconomic inequality. Enrolled households were also more likely to have more than one child per adult than non-enrolled households.

Table 3 (web version only, available from: http://www.who.int/bulletin) reports both bivariate and multivariate odds ratio estimates of the association between enrolment status and household head, household and village characteristics. The results of the multivariate logistic regression confirmed the positive association between enrolment in CHI and Bwaba ethnicity, higher education, higher socioeconomic status, a negative perception of the adequacy of traditional care, a higher proportion of children living within the household, an increased distance to the health facility, and a lower level of socioeconomic inequality within the community. After adjustment, the effect of occupation on enrolment could no longer be detected. Similarly, the association between enrolment and previous use of curative services was strongly attenuated and no longer significant. Adjustment confirmed that household head sex and age, household health status and its prior use of preventive services, and percentage of adults already participating in another risk-sharing arrangement were all factors not associated with enrolment. Adjustment reversed the effect on enrolment of the referral facility, indicating that assignment to a rural health facility was associated with lower odds of being enrolled.

Table 1. **Sociodemographic characteristics of the control group and of the non-enrolled population in the study area**

Sociodemographic characteristics	Controls in study ($n = 393$)	Non-enrolled population ($n = 2947$)[a]
Mean household age (years)	50	48
Male-headed households (%)	87	90
Mean household size	8	8
Household head ethnicity (%)		
Dafing	33	34
Samo	14	13
Bwaba	25	25
Mossi	17	17
Fulani	8	8
Other	3	3

[a] Complete information could be obtained for 2947 out of the 2971 non-enrolled households residing in the study area.

Discussion

Methodological considerations

Following the example set by previous studies documenting CHI experiences in Africa and Asia,[8,13–16,18,19] this study relied on the use of household survey data to explore determinants of enrolment in CHI. Household survey data have proved to be useful in quantifying the relationship between enrolment status and individual, household and community characteristics.[30] Within the sub-Saharan context, however, this is one of the first studies to focus exclusively on the decision to enrol. The two previous studies which explored quantitatively the decision to enrol in CHI did so within the framework of broader analyses primarily aimed at assessing the impact of insurance status on household health service utilization and health spending.[18,19]

The small sample size represents an important limitation of our study and in most instances is responsible for the width of the confidence intervals. The sample size and the choice to employ a case–control methodology were dictated by the limited number of households that had enrolled in CHI. Given the low enrolment rate, we treated enrolment in CHI as a rare outcome and applied a case–control methodology, rather than relying on a random population sampling.[31–33] In addition, we must acknowledge the potential bias derived from the fact that we were unable to interview all enrolled households (owing to a failure in field operations). Although we cannot estimate the exact extent and direction of the possible derived bias, we trust that missing only 17 households has not severely affected our results. Failing to interview less than 5% of all traced households falls within acceptable scientific standards.[32]

A potential criticism could be directed against our decision to carry out the study immediately following the end of the first enrolment campaign, when only a small number of households had accepted the offer to enrol. Field experience, however, shows that many schemes do not survive beyond two or three years because they never manage to overcome the initial problem of low enrolment.[4,7] Previous quantitative analyses into the

decision to enrol in CHI in sub-Saharan Africa focused on the experiences of relatively successful schemes[18] or of larger schemes initiated and supported by strong government initiatives,[19] thus reflecting the exceptional rather than the usual state of affairs in sub-Saharan Africa. We deliberately conducted the study immediately after the first campaign in order to be able to understand and address the prevailing problems of newly emerging schemes and inform policy-makers accordingly.

Policy implications

Our analysis identifies decision-makers' education and household socioeconomic status as significantly affecting the decision to enrol in CHI. Such findings may not be surprising, since they are in line with the literature on health service utilization[34–36] and with the evidence on participation in voluntary health insurance emerging from Asia.[9,10,14,15] Nevertheless, they are discouraging as they indicate that newly emerging CHI schemes in sub-Saharan Africa may reinforce rather than counteract existing inequalities in access that result from educational and socioeconomic background. In this case, the inability to counteract existing inequalities linked to education may be due to a promotional campaign which, in spite of its efforts to limit the use of written tools, fell short of effectively reaching those with the least schooling. The inability to counteract existing inequalities linked to socioeconomic status may be attributed to the fact that the scheme did not apply income-adjusted premiums or offer subsidies for poorer households.

The importance of scheme design in favouring or discouraging enrolment is further demonstrated by the fact that households with more than one child per adult were more likely to be enrolled. This appears to be an indication that households are likely to be responsive to differential adult and child premiums. Information from a complementary qualitative study of community preferences for the scheme provided additional insight into the result of the regression model:[25] the application of a differential premium for adults and children substantially encouraged enrolment because the community perceived such a strategy to be a culturally appropriate means of counteracting the tendency to privilege adult above child health care in resource-limited settings.[37,38]

Our study found no evidence that household health status or prior health service utilization influenced enrolment in CHI. Our results complement previous evidence from other sub-Saharan settings[18,19] and indicate that the obligation to enrol the entire household can successfully serve to limit adverse selection into a scheme. Evidence from China, however, suggests that adverse selection may take place within schemes which in principle stipulate household enrolment, as households may bypass such an obligation and only enrol the sickest members.[16] In the Nouna Health District, the close collaboration between the DSS and the CHI scheme ensured that the obligation to insure entire households could not easily be bypassed. In the absence of such a registration system, however, schemes may face the challenge of enforcing household enrolment, which, as our study suggests, can otherwise be a successful means of limiting adverse selection in settings where the implementation of complex underwriting procedures is not feasible.

The results of our multivariate analysis confirm the positive association between enrolment and a specific ethnic group[18] or community[19] reported in earlier studies. Previous research in the study area had already found that the Bwaba, an ethnic minority, held different risk perceptions regarding disease from those of other groups, and displayed greater openness towards new health initiatives.[39] Revealing the reasons behind ethnic differences, however, is beyond the reach of quantitative analysis relying on household survey data[30] and requires a complementary qualitative enquiry to explore how social dynamics within specific communities influence health-related behaviours, including the decision to enrol in CHI.[17]

The positive association between enrolment and judgement of the adequacy of traditional systems of care as being mediocre or poor is also in line with previous studies exploring health-care-seeking behaviour in the region[40,41] and can be understood intuitively. Our study is insufficient, however, to identify measures that could be used to promote enrolment by acting to alter perceptions of substitute systems of health care provision. Our study can highlight the existence of an association, but cannot provide any immediate policy guidance apart from the recommendation to invest in complementary qualitative research on illness perception and theories of disease causation which influence health care choices.

Evidence that, other factors held equal, enrolment is higher in communities living further from the health facility is counterintuitive and contradicts previous evidence from the Democratic Republic of the Congo[42] and Rwanda.[19] The difference may be attributable to the Nouna Health District promotion campaign, which purposely privileged distant communities. In addition, complementary qualitative findings have indicated that the comprehensive nature of the benefit package, including a wide range of first-line and second-line services, as well as emergency transport, was particularly appreciated by distant communities.[25,43] The experience of the Nouna Health District is therefore indicative of how a comprehensive benefit package and an extensive investment in promotion activities in remote rural areas may successfully counteract the potential barrier to enrolment imposed by distance.

The observed effect on enrolment of the referral facility is most likely a result of perceptions of the quality of services available in rural facilities compared with the urban facility. Counteracting such an effect would require substantial investment to ensure that rural facilities are as well-equipped as urban ones. In the short term, policy-makers should consider granting enrolees greater freedom of choice in first-line provider.

Our findings also highlight the fact that the individual decision to enrol in CHI is mediated by community characteristics. Our study shows that the introduction of CHI may turn out to be easier in communities which are already accustomed to extensive risk-sharing. Village indicators of socioeconomic inequality provide a measure of how resources are shared within a community and constitute a powerful proxy to assess widely held attitudes towards risk-sharing and solidarity.[28,44] The communities with the lowest levels of socioeconomic inequality were not necessarily the wealthiest. Across the five villages with the lowest levels of socioeconomic inequality, median household six-month expenditure ranged from 26 600 CFA (US$ 50) to 656 649 CFA (US$ 1270). The fact that we did not observe an effect on enrolment of the percentage of adults in another formal or semi-formal risk-sharing arrangement, however, is an indication

that risk-sharing is not necessarily channelled through formal and semi-formal arrangements. It is plausible to assume that communities that achieve low levels of socioeconomic inequality do so through informal mechanisms linked to the ancient African tradition of risk-sharing[45–47] rather than through institutionalized arrangements. Therefore, our study suggests that it is not necessarily previous experience of institutionalized arrangements that favours enrolment in CHI, but rather more generalized attitudes and practices pertaining to the sharing of resources in the community. In this regard, social marketing could effectively be used to modify attitudes and practices, encouraging increased risk-sharing and ultimately favouring enrolment.

Conclusion

Our study underlines the fact that the decision to enrol in CHI is shaped by a combination of household head, household and community factors. This invites reflection on the need to implement multi-faceted interventions that can effectively offset potential barriers to enrolment at all three levels. Unless the problem of low enrolment is addressed systematically and adequate policies to enhance participation are designed, CHI risks remaining an initiative exclusively accessible to certain groups within society, i.e. the wealthiest, the best educated, and those living in communities already accustomed to extensive risk-sharing. This would mean that CHI would fail to serve, as its advocates wish, as a step towards national health insurance coverage,[5,48] possibly yielding negative effects on the overall health financing and health provision system of a country.[49]

In addition, given the need to expand the evidence base for the development of CHI in sub-Saharan Africa, our study demonstrates the need for further research in the field, using studies similar to the one presented in this paper and by exploring in greater detail (e.g., through the application of qualitative methods of analysis) a selected set of factors which can be identified, but not easily explained, by regression modelling. ■

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Competing interests: none declared.

Résumé

Motifs de la souscription d'une assurance-maladie communautaire par les habitants de l'Afrique subsaharienne : étude cas-témoin en population rurale menée au Burkina Faso

Objectif Identifier les facteurs associés à la décision de s'affilier à un régime d'assurance-maladie communautaire récemment mis en place.

Méthodes Nous avons mené une étude cas-témoin en population parmi 15 communautés du Burkina Faso auxquelles avait été proposée en 2004 une assurance-maladie. Comme sujets de l'étude, nous avons sélectionné 154 individus parmi les membres de ces communautés s'étant affiliés au régime et un échantillon aléatoire de 393 foyers ne s'étant pas affiliés (témoins). Nous avons fait appel à une analyse par régression logistique non conditionnelle (en appliquant une correction de Huber-White destinée à tenir compte de la possibilité de grappage au niveau communautaire) pour étudier l'association entre le statut d'affiliation et une série de caractéristiques relatives au chef de famille, au foyer et à la communauté.

Résultats L'analyse multivariée fait apparaître une association entre l'affiliation à ce régime et l'appartenance à l'ethnie Bwaba, un niveau d'éducation ou un statut socioéconomique élevés, une perception négative de l'efficacité des soins de type traditionnel, une proportion importante des enfants vivant dans le foyer, l'éloignement de l'établissement de santé et un faible niveau d'inégalité socioéconomique au sein de la communauté, mais n'indique aucun lien avec l'état de santé du foyer ou un recours antérieur de celui-ci à des services de santé.

Conclusion Notre étude a apporté des preuves de l'influence sur la décision d'affiliation au régime d'assurance-maladie communautaire d'une combinaison de facteurs relatifs au chef de famille, au foyer et à la communauté. Les stratégies visant à augmenter le taux d'affiliation doivent agir à l'ensemble de ces trois niveaux. A la lumière de ces résultats, nous avons examiné certaines recommandations politiques et mis en évidence des aspects à étudier de manière plus approfondie.

Resumen

Análisis de la decisión de acogerse a un seguro médico comunitario en el África subsahariana: estudio poblacional de casos y controles en la Burkina Faso rural

Objetivo Identificar los factores asociados a la decisión de contratar un seguro médico comunitario (SMC) de reciente creación.

Métodos Realizamos un estudio de casos y controles basado en la población entre 15 comunidades a las que se ofreció la posibilidad de acogerse a un seguro en 2004 en zonas rurales de Burkina Faso. Seleccionamos para el estudio a la totalidad de los 154 hogares asegurados (casos) y a una muestra aleatoria de 393 hogares no asegurados (controles). El estudio de la asociación entre el hecho de estar o no asegurado y un conjunto de factores relacionados con el cabeza de familia, el hogar y la comunidad se realizó mediante una técnica de regresión logística incondicional (aplicando la corrección de Huber-White para tener en cuenta los conglomerados a nivel de la comunidad).

Resultados El análisis multifactorial efectuado reveló que la contratación del SMC estaba asociada a la etnia Bwaba, la enseñanza superior, un mayor estatus socioeconómico, una imagen negativa de la atención tradicional, la presencia de una mayor proporción de niños en el hogar, una mayor lejanía del establecimiento de salud y un menor nivel de desigualdad

socioeconómica dentro de la comunidad, pero no con el estado de salud de los miembros del hogar o con la utilización previa de los servicios de salud.

Conclusión Los datos de nuestro estudio parecen indicar que la decisión de acogerse al SMC está determinada por una combinación de factores relacionados con el cabeza de familia, el hogar y la comunidad. Las políticas de fomento de la contratación de un seguro deberían intervenir en esos tres niveles. A partir de nuestros resultados, analizamos determinadas recomendaciones normativas y destacamos diversos ámbitos para realizar nuevas investigaciones.

ملخص

فهم الانضمام إلى الضمان الصحي الاجتماعي في جنوبي الصحراء الأفريقية: دراسة للحالات والشواهد من السكان في ريف بوركينا فاسو

الهدف: التعرُّف على العوامل التي تؤخذ بالحسبان لدى اتِّخاذ قرارات الانضمام إلى الخطة الحالية للضمان الصحي الاجتماعي.

الطريقة: أجرينا دراسة للحالات والشواهد من السكان في 15 مجتمعاً من المجتمعات التي يُتاح فيها الضمان عام 2004 في ريف بوركينا فاسو. ولكي نقبل العناصر في الدراسة اخترنا من السكان 154 حالة (الذين انضموا إلى الضمان الصحي الاجتماعي) وعينة عشوائية تتألَّف من 393 من الشواهد الذين لم ينضموا إلى الضمان الصحي الاجتماعي. واستخدمنا طريقة التحوُّف اللوجستي غير المشروط وطبقنا تصحيح هوبر وايت لحساب وتعيين المجموعات العنقودية في مستوى المجتمع، وذلك لكشف الترافق بين حالة الانضمام ومجموعة أرباب الأُسَر وأعضاء الأسرة ولخصائص المجتمعات المدروسة.

الموجودات: أظهر التحليل المتعدِّد المتغيِّرات أن الانضمام إلى الضمان الصحي الاجتماعي قد ترافق بالانحدار من العرق ((بوابا))، وبالتعليم الرفيع المستوى، وبالحالة الاجتماعية والاقتصادية الرفيعة، وبالإدراك للجوانب السلبية لكفاية الرعاية التقليدية، وبنسبة أكثر ارتفاعاً من الأطفال الذين يعيشون في المسكن، وببُعد أكبر عن المرفق الصحي، وبمستوى أخفض لعدم المساواة الاجتماعية والاقتصادية ضمن المجتمع. ولكنه لم يترافق مع الحالة الصحية للسكان أو باستخدامهم السابق للخدمات الصحية.

الاستنتاج: قدمت دراستنا البيِّنة على أن قرار الانضام إلى الضمان الصحي الاجتماعي يُتَّخذ بمشاركة رب الأسرة وأعضاء الأسرة وعوامل اجتماعية أخرى. وينبغي للسياسات التي تهدف إلى تعزيز هذا الانضمام أن تعمل على هذه المستويات الثلاثة جميعها. وانطلاقاً من هذه الموجودات ناقشنا بعض التوصيات الخاصة بالسياسات ووضحنا جوانب أخرى لإجراء المزيد من البحوث عليها.

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Table 2. **Descriptive sample characteristics of study population**[a]

Variables	In CHI[b] ($n = 137$)	Not in CHI ($n = 393$)	χ^2 *P*-value
Household head characteristics			
Sex			
Female	13 (9.49)[c]	51 (12.98)	
Male	124 (90.51)	342 (87.02)	0.281
Ethnicity			
All others	63 (45.99)	288 (73.28)	
Bwaba	74 (54.01)	105 (26.72)	0.001
Education			
No schooling	77 (56.20)	335 (85.24)	
Primary school	33 (24.09)	44 (11.20)	
Secondary school	27 (19.71)	14 (3.56)	0.001
Age in years			
20–40	47 (34.31)	115 (29.26)	
41–60	66 (48.18)	184 (46.82)	
⩾61	24 (17.52)	94 (23.92)	0.252
Occupation			
Farmer	92 (67.15)	297 (75.57)	
Other occupation	45 (32.85)	96 (24.43)	0.056
Traditional healer care rating			
Adequate	14 (10.22)	196 (49.87)	
Mediocre/inadequate	123 (89.78)	197 (50.13)	0.001
Household characteristics			
Household expenditure			
1st quartile (poorest)	15 (10.95)	118 (30.03)	
2nd quartile	25 (18.25)	107 (27.23)	
3rd quartile	37 (27.01)	96 (24.43)	
4th quartile (wealthiest)	60 (43.80)	72 (18.32)	0.001
Child/adult ratio			
⩽1	86 (62.77)	289 (73.54)	
>1	51 (37.23)	104 (26.46)	0.017
Chronic diseases			
None	48 (35.04)	135 (34.35)	
At least one	89 (64.96)	258 (65.65)	0.884
Use of curative care in previous 12 months			
No contact	81 (59.12)	303 (77.10)	
At least one contact	56 (40.88)	90 (22.90)	0.001
Use of preventive care in previous 12 months			
No contact	102 (74.45)	306 (77.86)	
At least one contact	35 (25.55)	87 (22.14)	0.414
Village characteristics			
Distance to health facility			
Near (⩽5 km)	90 (65.69)	291 (74.05)	
Far (>5 km)	47 (34.31)	102 (25.95)	0.061
Referral facility			
Urban first-line facility	57 (41.61)	189 (48.09)	
Any rural first-line facility	80 (58.39)	204 (51.91)	0.190
Socioeconomic inequality			
High level of inequality	54 (39.42)	190 (48.35)	
Middle level of inequality	35 (25.55)	136 (34.61)	
Low level of inequality	48 (35.04)	67 (17.05)	0.001
Participation in other risk-sharing			
Low level of participation	50 (36.50)	138 (35.11)	
Middle level of participation	38 (27.74)	142 (36.13)	
High level of participation	49 (35.77)	113 (28.75)	0.150

[a] Values indicate numbers.
[b] CHI = community health insurance scheme.
[c] Figures in parentheses are percentages.

Table 3. **Odds ratio (OR) estimates for bivariate and multivariate analysis**

Variables	Bivariate		Multivariate[a]	
Household head characteristics	**OR**	**CI[b]**	**OR**	**CI**
Sex				
Female	1.00		1.00	
Male	1.42	(0.75–2.70)	0.98	(0.61–1.57)
Ethnicity				
All others	1.00		1.00	
Bwaba	3.22	(2.15–4.82)	2.06	(1.17–3.63)
Education				
No schooling	1.00		1.00	
Primary school	3.26	(1.95–5.46)	3.86	(2.01–7.43)
Secondary school	8.39	(4.20–16.75)	7.45	(2.63–21.01)
Age in years				
20 to 40	1.00		1.00	
41 to 60	0.88	(0.56–1.36)	1.21	(0.77–1.90)
61+	0.62	(0.36–1.10)	1.18	(0.36–3.86)
Occupation				
Farmer	1.00		1.00	
Other occupation	1.51	(0.99–2.31)	0.87	(0.48–1.58)
Traditional healer care rating				
Adequate	1.00		1.00	
Mediocre/inadequate	8.74	(4.86–15.72)	13.35	(4.94–36.09)
Household characteristics				
Household expenditure				
1st quartile (poorest)	1.00		1.00	
2nd quartile	1.84	(0.92–3.67)	3.44	(1.31–9.06)
3rd quartile	3.03	(1.57–5.85)	3.47	(1.19–10.12)
4th quartile (wealthiest)	6.56	(3.47–12.40)	7.67	(3.14–18.75)
Child/adult ratio				
⩽ 1	1.00		1.00	
> 1	1.65	(1.09–2.49)	1.76	(1.02–3.04)
Chronic diseases				
None	1.00		1.00	
At least one	0.97	(0.65–1.46)	1.03	(0.71–1.47)
Use of curative care in previous 12 months				
No contact	1.00		1.00	
At least one contact	2.33	(1.54–3.52)	1.28	(0.82–1.99)
Use of preventive care in previous 12 months				
No contact	1.00		1.00	
At least one contact	1.21	(0.77–1.90)	1.38	(0.92–2.04)
Village characteristics				
Distance to health facility				
Near (⩽ 5 km)	1.00		1.00	
Far (> 5 km)	1.49	(0.98–2.26)	4.51	(2.04–9.97)
Referral facility				
Urban first–line facility	1.00		1.00	
Any rural first–line facility	1.30	(0.88–1.93)	0.38	(0.15–0.95)
Socioeconomic equality				
High level of inequality	1.00		1.00	
Middle level of inequality	0.91	(0.56–1.46)	1.25	(0.71–2.19)
Low level of inequality	2.52	(1.56–4.07)	7.54	(3.37–16.87)
Participation in other risk–sharing				
Low level of participation	1.00			
Middle level of participation	0.74	(0.46–1.20)	0.81	(0.43–1.52)
High level of participation	1.20	(0.75–1.90)	1.55	(0.61–3.93)
Observations	530		530	

[a] Multivariate estimates were computed using Huber–White correction techniques to account for clustering at the community level. The OR estimates in the multivariate analysis were simultaneously adjusted for all other variables in the model.

[b] CI = confidence interval (shown in parentheses).