



**Effect of informal financial support for healthcare on health Insurance uptake: evidence from a mixed-methods study in Tamale metropolis of northern Ghana**

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## Abstract

Attempts to study the determinants of health insurance enrolment in resource-poor settings have often given less consideration to the potential influence of informal risk-sharing systems on individuals and households' decisions about health insurance.

This paper contributes to existing discussions in this area by examining the effect of informal financial support for healthcare, an example of informal risk-sharing arrangement, on enrolment in the Ghana National Health Insurance Scheme (NHIS). It is based on a mixed-methods research in Tamale metropolis of northern Ghana.

The study found widespread availability and reliance on informal support among low-income households to finance out-of-pocket healthcare expenditure. Informal financial support for enrolment into the NHIS was noted to be less available. The study further found less strong but suggestive evidence that the perceived availability of informal financial support for healthcare by individuals diminishes their enrolment in the NHIS. The paper emphasizes the need for theory and policy on health insurance uptake in resource-constrained settings to consider existing informal risk-sharing arrangements as much as other known determinants of enrolment.

## Keywords

NHIS, health insurance, informal risk-sharing, informal financial support, enrolment, Ghana.

## Background

There has been a growing interest in health insurance as a financing model for achieving universal health coverage (UHC) in low-and -middle income countries (LMICs) [1]. As a result, many LMICs, including Ghana, have implemented a range of different forms of 'social' health insurance schemes. Historically, 'social' health insurance referred to mandatory public health insurance programmes; however, it is now widely used to describe a range of not-for-profit prepayment healthcare financing programmes that are either mandatory or voluntary, including schemes that are commonly called national health insurance, community-based health insurance, and micro-health insurance. At the core of social insurance schemes are the principles of social solidarity and risk and resource pooling which proponents argue facilitate greater financial protection, access to healthcare and improvement in health outcomes [2].

Studies have demonstrated that social health insurance schemes do indeed improve access to care, financial risk protection and health outcomes, albeit amongst individuals who are insured in the scheme [3]. However, a key challenge with these schemes concerning UHC has been low enrolment rate, especially among low-income households in the informal sector UHC [4]. It has been suggested that for social health insurance schemes to have greater impact, countries need to focus on scaling up membership coverage by increasing enrolment and retention particularly among individuals in the informal sector [5]. Copious studies have discussed the determinants of insurance uptake and the mechanisms for improving coverage in

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3 resource-constrained settings. Many of these studies, which predict enrolment  
4 decisions of individuals and households, are based on econometric models; fewer  
5 studies employ qualitative and mixed-methods approaches to explore the  
6 determinants of enrolment in greater depth [5]. These have mostly identified causes  
7 of low insurance uptake in the informal sector to include issues around affordability,  
8 perceive benefits of insurance, knowledge and understanding of insurance principles  
9 and socio-cultural practice [4]. A systematic review of factors affecting uptake of  
10 voluntary and community-based health insurance programmes in LMICs found a  
11 positive association between enrolment and key socio-economic and demographic  
12 variables such as household income, household size, female headed household,  
13 and education and age of head of household. The presence of chronic illness also  
14 had a positive influence on enrolment, perhaps because it reflects a need for  
15 healthcare and the potential to benefit from the scheme. The review further revealed  
16 that while affordability (financial constraints, lack of money) was a major constraint  
17 for enrolment, such problems were compounded by inflexible premium collection and  
18 payment modalities. Other significant determinants of enrolment identified were trust  
19 in scheme management, scope of benefits package and quality [5]. These studies  
20 provide useful insights into understanding the demand for health insurance in  
21 resource-poor settings, however, to the best of my knowledge, few of them have  
22 given sufficient consideration to the potential influence of informal risk-sharing  
23 system, a form of informal insurance, on insurance decisions of individuals and  
24 households.

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52 Therefore, this paper represents an attempt to contribute to the broader discussion  
53 on the effect of informal risk-sharing arrangements on voluntary insurance uptake. It

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3 focuses on informal financial support for healthcare, which refers here to various  
4 financial assistance such as gifts and loans that are exchanged between family,  
5 friends and other social network members to help pay medical bills [6]. Excluded  
6 from the formal sector, most low-income households rely on informal support  
7 arrangements to deal with health related shocks [7]. Theoretically, such support may  
8 facilitate insurance uptake by enabling an individual to pay for the membership cost.  
9 Conversely, the availability of informal support to pay for healthcare or the perception  
10 that such support will be available during illness may reduce a person's need for  
11 formal health insurance [8]. Also, excessive financial commitment to members of  
12 one's network may impose financial constraints on an individual's ability to insure.  
13 The influence of informal support on insurance may not be limited to the actual  
14 availability of support, but also the perception that such support would be available  
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33 Empirical evidence on the effects of informal financial support on health insurance  
34 uptake is scanty. Exceptions include a study in Vietnam which found that informal  
35 financial support (networks) crowd out the benefits of formal health insurance and  
36 reduced uptake [9]. Contrariwise, other studies, mainly focusing broadly on social  
37 capital, have suggested that reciprocal support within social networks may facilitates  
38 insurance uptake by enabling individuals to afford the financial cost of scheme  
39 membership [10–12]. Most studies are based on the reverse impact of formal health  
40 insurance on informal support, with the majority reporting a negative effect [13–15].  
41 Ligon et, al. [16] explained that because formal health insurance provides an  
42 alternative protection against illness it tends to reduce the social costs associated  
43 with non-participation in informal social protection systems. Bowles [17] also argued  
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3 that the uptake of formal insurance by some members of a network sends a signal to  
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5 other members about the weakening of the network to protect them against illness  
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7 which creates a disincentive for them to commit to the network (and its risk-sharing  
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9 arrangements). Suggesting that as more individuals in a community embrace formal  
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11 health insurance, informal social protection systems become less relevant which  
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13 further persuades many people in the community to participate in the scheme.  
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15 However, DeWeerd and Dercon [2006] observed that rather than substitute, formal  
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17 and informal insurance complement each other because they each do not often  
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19 provide full protection against illness on their own.  
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24 This paper examines the effect of informal financial support for healthcare on  
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26 enrolment in the Ghana National Health Insurance Scheme (NHIS). It addresses the  
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28 questions: does the availability of informal financial support for healthcare during  
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30 illness affect an individual's decision to enrol or not to enrol in the NHIS? Is so, what  
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32 implication does this have for theory and practice on health insurance uptake in  
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34 resource-poor settings. The next section presents an overview of the NHIS. This is  
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36 followed by an outline of the research methods, research findings, discussion and  
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38 conclusions respectively.  
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## 44 **Overview of the NHIS**

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49 The NHIS was launched in 2004 to minimize financial barriers to care and ensure  
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51 equitable access to quality healthcare for all Ghanaians [19]. Membership in the  
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53 NHIS is legally compulsory for all residents in Ghana, but in practice, it is voluntary  
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3 [20]. The scheme is funded with tax revenue (2.5% levy on goods and services),  
4 Social Security and National Insurance Trust (SSNIT) contributions and premium  
5 payments. Formal sector workers who are members of SNNIT are exempt from  
6 paying premium because 2.5% of their SSNIT contribution is transferred to the NHIS.  
7 Informal sector adults and non-SSNIT formal sector workers pay annual membership  
8 premium. The premium is supposed to range from GH¢7.20 (US\$2) to GH¢48.00  
9 (US\$13) depending on individual income bracket. However, in practice, a flat rate of  
10 GH¢10.00 (US\$ 2.7) is charged due to difficulty in accessing people's income levels.  
11 Most members pay an additional administrative fee of about GH¢4 (US\$ 1.2) [21]. (1  
12 Ghana Cedis was equivalent to 3.7 USD in 2015). The scheme exempts certain  
13 groups of the population from paying premium, namely, the elderly (considered to be  
14 people who are 70 years and over), children who are under 18 years, indigents,  
15 mental health patients and pregnant women [22]. Members of the scheme are  
16 entitled to a range of free outpatient and inpatient healthcare services in accredited  
17 public and private healthcare facilities [23].  
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Studies have shown that the NHIS provides greater financial protection and improved access to healthcare among people in the premium paying category. However, enrolment coverage remains low, especially among premium-paying individuals in the informal sector. As of 2013, just a little over 38% of Ghana's population, mainly people who are exempt from paying premium, was insured in the NHIS, nearly ten years after the scheme had started [19]. Substantial socio-economic inequalities remain in NHIS enrolment, with fewer low-income and informal sector households participating in the scheme [24]. Previous studies have identified a wide range of factors that may be responsible for the inequities in coverage,

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3 including poverty, lack of information, poor quality of care, unaffordable premiums,  
4 and administrative bottlenecks, etc.[24–27]. Most of Ghana's population work in the  
5 informal sector, and are reliant of informal support arrangements to the meet their  
6 daily needs, including healthcare. As a result, it was hypothesised in the present  
7 study that part of the reasons for the low NHIS uptake among individuals in the  
8 informal sector is due to the availability of informal financial support for healthcare.  
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## 18 **Methods**

### 19 *Study settings*

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22 Data for the research was collected from the Tamale metropolis in northern Ghana,  
23 between August and November 2015. The area consist of urban and peri-urban  
24 communities, and has one of the lowest NHIS coverage rates in Ghana, estimated  
25 to be around 30% of the total population in 2014 [28]. Residents are predominantly  
26 non-literate [29], and work in the informal sector of the economy, mainly as petty  
27 traders, farmers, artisans, retailers and food sellers [28]. Despite rapid urbanization  
28 in recent years, much of social activities in the metropolis revolves around kinship  
29 and friendship networks.  
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### 44 *Study Design*

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46 Quantitative and qualitative methods were employed to collect the data. The primary  
47 purpose of the quantitative method was to ascertain whether informal financial  
48 support for healthcare had any effect on NHIS enrolment. It examined the hypothesis  
49 that individuals who perceive to have greater informal support networks or are likely  
50 to obtain support from their networks to pay for healthcare during illness are less  
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3 likely to enrol in the NHIS. Surveys were carried out by experienced local  
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5 researchers to collect a range of information relating to individuals' socio-  
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7 demographic characteristics, social support networks and participation in the NHIS.  
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9 This information was complemented with semi-structured interviews conducted by  
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11 the author to obtain deeper insights into people's perceptions, experiences,  
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13 motivations and practices on informal risk-sharing. Ethical approval for this study  
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15 was obtained from the Coventry University ethics review committee.  
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### 20 *Sampling*

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22 A two-stage sampling approach was employed to select respondents for the survey.  
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24 Six urban and peri-urban communities were first randomly selected from the  
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26 metropolis; followed by a selection of at least 100 respondents from each of the  
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28 selected communities. A total of 800 respondents were chosen for the survey,  
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30 although only 776 respondents provided all the information that could be used for the  
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32 analysis. To qualify for selection, prospective respondents needed to be 18 years  
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34 and above, unemployed or working in a non-wage job (informal sector), and not  
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36 eligible for NHIS premium exemption<sup>†</sup>. The exclusion of non-premium paying  
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38 individuals was necessary to eliminate any potential bias that premium exemption  
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40 may have had on individuals' motivation and ability to enrol in the NHIS. Similar  
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42 inclusion and exclusion criteria were used to select 27 respondents for the semi-  
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44 structured interviews. These were purposively selected to ensure adequate  
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46 representation of individuals from the different study communities and gender.  
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53 <sup>†</sup> Pregnant women, elderly people, beneficiaries the Livelihood Empowerment against Poverty Programme,  
54 and formal sector workers, who are exempt from premium payment in the NHIS, were excluded from the  
55 study.

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*[Insert Table 1 here]*

### *Study Variables*

The outcome variable considered in the quantitative analysis was membership in the NHIS (or NHIS status). This was represented by two variables: insured and uninsured. The main explanatory variable was informal financial support for healthcare. This was measured by two proxy variables: (1) number of financial support networks for healthcare that an individual perceived to have, and (2) level of confidence in obtaining financial support from one's social networks to pay for healthcare when ill. Following Sarason et al.'s [30] approach, these proxy variables were assessed by asking respondents the following questions: who amongst your friends, family members and community groups can you really count on to help you with financial support to access healthcare when you are ill? How confident are you that you will be able to obtain financial support for healthcare from these social networks when you are ill? The number of supportive persons/groups reported by each respondent was summed to represent a score (index) of their perceived informal financial support network for healthcare (PIFSN). Principal component analysis was performed on all the PIFSN items, with all of them loading on a single factor. Each of the items had an eigenvalue greater than one, and therefore were all retained to calculate the PIFSN index [31]. The reliability of the PIFSN index was assessed, which produced a Cronbach's alpha of 0.731, indicating a high reliability of the index [32]. Confidence in the availability of informal financial support for healthcare was represented on a three-point scale, ranging from 'less confident' (with a score of 1) to highly confident (with a score of 3).

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5 In addition to the explanatory variables, eight key variables with a potential to  
6 influence NHIS uptake were identified in the literature and controlled in a regression  
7 analysis [33]. These control variables included gender, literacy level, age, self-rated  
8 health status (SRHS), residential location, socio-economic status (SES), trust in  
9 NHIS management, and trust in healthcare providers [25,34] . SRHS was assessed  
10 based on a recall period of 12 months relative to the time of the survey. Using Filmer  
11 and Pritchett's [36] approach, SES was measured based on respondents' household  
12 wealth characteristics, with questions adapted from the 2008 Ghana Demographic  
13 and Health Survey (reference data). Factor weights and quintile cut-off points from  
14 the reference data were used to standardize respondents' SES to the general  
15 population [37]. Although respondents' age was reported on a continuous scale,  
16 they were recoded into three categories to reflect differences in health needs in the  
17 population [23]. Literacy level was assessed based on a yes-and-no question posed  
18 to respondents on whether they were capable of reading and writing in English.  
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### 38 *Analysis*

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40 The quantitative data was analysed with SPSS 20 software using bivariate and  
41 multivariate analytic techniques. Chi square test was carried out to assess the  
42 association between the independent variables and the outcome variable. It was also  
43 used to identify control variables that have significant relationship with NHIS  
44 enrolment for inclusion in the regression model to improve model fitness. Binary  
45 logistic regression was conducted to examine the independent effect of informal  
46 financial support on NHIS enrolment. This technique was chosen because the  
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3 outcome variable was measured in a categorical scale [38]. Three regression models  
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5 were fitted to fully understand the independent effect of the explanatory variables.  
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7 Model 1 consisted of six control variables that had significant relationship with NHIS  
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9 enrolment from the Chi square analysis, namely, gender, literacy level, SES, SRHS,  
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11 trust in NHIS management, and trust in healthcare providers. Model 2 was fitted to  
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13 assess the independent effect of the two informal financial support variables on  
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15 NHIS enrolment, and comprised of the PIFSN index, the confidence score, and all  
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17 the control variables of model 1. The third model (Model 3) entailed all the control  
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19 variables of model 1, the confidence score, and disaggregated variables of the  
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21 PIFSN index (i.e. number of close family relatives, number of friends, and number  
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23 community groups/associations). Model 3 aimed to assess the individual contribution  
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25 of each of the informal financial support network variables. Model fitness was  
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27 assessed with Omnibus Chi square test of model coefficient, percentage of  
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29 respondents correctly classified as insured, sensitivity, specificity and Nagelkerke  $R^2$   
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31 (See Table 4). All the models produced a good fit of the data, with statistically  
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33 significant ( $p < 0.05$ ) Chi square values. Additionally, preliminary tests were carried  
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35 out on the variables, using Box-Tidwell test of linearity of continuous independent  
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37 variables, outlier test and multicollinearity test, which showed that the data was fit for  
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39 regression analysis. For each model, adjusted odds ratios (AOR) of the predictor  
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41 variables are reported together with their 95% confidence intervals (95 % CI) to show  
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43 their contribution to predicting NHIS enrolment when all other variables in the model  
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45 are controlled [39].  
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52 Data for the semi-structured interviews were audio-recorded, transcribed verbatim,  
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54 and analysed with NVivo 10 software using inductive analytic technique. The results  
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3 of the interview were validated in two separate workshops involving women and  
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5 youth groups, some of whose members participated in the interviews.  
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## 8 9 **Results**

### 10 11 12 13 ***Informal financial support and healthcare financing***

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18 The use of informal support to pay for healthcare was ubiquitous in the study  
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20 community. As illustrated in Table 3, the research respondents had an average of  
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22 just under eight individuals or groups, mainly friends and family members, whom  
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24 they perceived would support them to pay for their healthcare when they are ill.  
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26 Close family members were identified as the most useful source of financial support  
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28 for healthcare, followed by close friends. Support arrangements for healthcare were  
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30 mainly bilateral, involving individuals and households. Although group-based support  
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32 arrangements were prevalent, they were largely common among closely-knit  
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34 networks such as close family members and youth and women's associations. No  
35  
36 community-wide support arrangements were reported. Support exchanges among  
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38 family members were mostly in the form of gifts. Loans were largely forbidden  
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40 among close family members but common among friends and associational network  
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42 members. Such loans were exchanged on flexible payment terms, mostly with no  
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44 interests and timeline for repayment. However, individuals were generally apathetic  
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46 towards loans due in part to stigma, religion (perception that loans are a source of  
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48 usury which is forbidden in Islam) and fear of default.  
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Illness was widely deemed to attract greater financial assistance compared with other forms of need. However, the availability of support during illness was primarily influenced by perception of the severity of the illness. Individuals who are deemed to be severely ill were more likely to receive financial assistance from their network members: *"when you are ill people want to help you, when you are not they don't want to help...when your sickness is serious they are more willing to help, if it is just malaria they say it is not serious enough ...."* (Insured female respondent). Despite the widespread reliance on informal support for healthcare, some respondents reported that such supports were sometimes "insufficient", "irregular" and "unavailable".

Unlike payment for medical bills, little informal financial support was reported to be available to help with NHIS enrolment. Very few respondents had received financial support from their networks to pay for NHIS membership. A key reason commonly cited for the lack of support for NHIS enrolment was that health insurance is a 'luxury', and not urgent. Some respondents also noted that support for health insurance enrolment evoked less social recognition and associated with little obligation compared with direct support for healthcare during illness: *"people will not blame me if I am not able to help my wife, mother or sister to enrol in the NHIS. But if they are ill there is an obligation on me to ensure that they go to the hospital... there is that[social] pressure... you can't even live with yourself with that... But it is not the same with health insurance"* (Insured male respondent).

### ***Effect of informal financial support for healthcare on NHIS enrolment***

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3 The relative availability and widespread reliance on informal financial support for  
4 healthcare leads to the question: how does this influence people's decision to enrol  
5 in the NHIS? Table 4 presents results of a binary logistic regression on the  
6 relationship between informal financial support variables and participation in the  
7 NHIS. It entails three regression models fitted around different permutations of the  
8 independent variables (see the analysis section for further details about the models).  
9  
10 Adjusting for all other factors in the three models the results show that some of the  
11 control variables are significant predictors of NHIS enrolment, namely, gender,  
12 literacy level, SES, trust in NHIS management and trust in healthcare providers. The  
13 odds of enrolling in the NHIS were about 63% or more lower for male respondents  
14 compared with their female counterparts. Literate respondents were nearly two times  
15 as likely to insure compared with non-literate respondents. Also, trust in NHIS  
16 management and healthcare providers significantly increased the odds of enrolling in  
17 the NHIS. Although no significant difference was observed in the odds of enrolment  
18 between respondent with 'good' health and those with 'poor' health, respondents  
19 who reported to have 'fair' health status were twice or more likely to insure than  
20 those with 'poor' health status. Respondents in the highest SES quintile (Q5) were  
21 nearly six times more likely to insure than those in the lowest quintile (Q1) in Model  
22 1, seven times more in Model 2 and five times more in Model 3, suggesting that  
23 socioeconomic status is an important mediator of NHIS enrolment.  
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48 In Model 2, all the informal financial support variables were found to be significantly  
49 associated with NHIS enrolment. Each additional unit increase in PIFSN reduced the  
50 odds of enrolment by 7.5% (AOR 0.925,  $p < 0.01$ , 95% CI 0.881 - 0.972). Also, the  
51 odds of enrolment were 58% (AOR 0.419,  $p < 0.01$ , 95% CI 0.234 - 0.749) lower for  
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3 respondents who were 'very confident' about obtaining informal financial support for  
4 healthcare compared with those who were 'less confident' about receiving such  
5 support. In Model 3, where the PIFSN variable is disaggregated, the result indicates  
6 that of all informal financial support variables, level of confidence about receiving  
7 informal financial support is the strongest predictor of NHIS enrolment ( $p=0.010$ ),  
8 followed by number of close family relatives ( $p=0.028$ ), and number of friends ( $p=$   
9  $0.04$ ) respectively. The number of supported community groups/association was not  
10 found to be a significant predictor of NHIS enrolment ( $p = 0.156$ ). Overall, the results  
11 of the regression analysis suggest that as individuals' perception of the availability of  
12 informal financial support to pay for healthcare increases, their likelihood of enrolling  
13 in the NHIS reduces.  
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32 When respondents were asked whether the availability of informal financial support  
33 for healthcare affected their decisions to enrol in the NHIS, a third of them responded  
34 in the affirmative. Many respondents were of the view that the NHIS did not offer  
35 anything significantly better compared with existing informal support arrangements in  
36 terms of financing healthcare. Although some respondents frequently commended  
37 the NHIS for providing predictable healthcare support, they also noted that it was  
38 riddled with many problems including unaffordable premiums and difficulties in  
39 registration and membership renewal.  
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51 Evidence on the reverse effect of the NHIS on informal financial support for  
52 healthcare was mixed. On the one hand, most insured respondents said they  
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3 continued to rely on support from their informal networks to supplement the NHIS to  
4 pay for healthcare because the NHIS did not cover all healthcare costs/services: “*If*  
5 *you have insurance and you go to the hospital you still have to pay for some*  
6 *services. It [NHIS] is not enough, you still need help from your family and friends to*  
7 *pay for care that even when you are insured*” (Insured female respondent). However,  
8  
9 a few respondents mentioned that they had observed a reduction in the demand for  
10 financial support for healthcare from friends and family members since the  
11 introduction of the NHIS. There appeared to be an increasing expectation that  
12 everyone signs up for the NHIS. People who failed to enrol were deemed to be  
13 irresponsible and not deserving help when they are ill: “*Now health insurance is*  
14 *everywhere so if you don’t insure and you fall sick, don’t expect anybody to help you,*  
15 *it is your fault...*” (Insured male respondent).  
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### 31 **Other factors that influenced NHIS enrolment**

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35 Apart from informal financial support for healthcare, another key factor which  
36 influenced individual’s decisions about NHIS enrolment was perception about their  
37 health risks. Health insurance was widely perceived to be a thing for sick people.  
38 Most individuals were unlikely to register or renew their membership if they  
39 perceived themselves to be ‘healthy’: “*I don’t normally get sick so health insurance is*  
40 *not for me....*” (Uninsured male respondent). Financial constraints were also widely  
41 mentioned as a reason for non-enrolment. “*I like the NHIS but I can’t afford it now....*”  
42 (Uninsured male respondent). People were mostly discouraged by long distance to  
43 NHIS registration centres, long waiting time and delays in membership registration.  
44 Mistrust and perceptions of unequal treatment and poor-quality service associated  
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3 with NHIS care were also common reasons for non-participation. The NHIS was  
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5 widely perceived to be associated with long-waiting times in hospitals, poor-quality  
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7 medicines and poor treatment by health workers. Some respondents did not insure  
8  
9 because the NHIS did not cover certain medicines and healthcare services that they  
10  
11 needed. However, for some respondents, the decision to enrol was less driven by  
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13 the direct benefits of the NHIS, but rather due to the social costs and benefits  
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15 associated with enrolment. Some respondents insured because of pressure from  
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17 family and friends.  
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## 23 Discussion

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27 The main objective of the study was to ascertain whether informal financial support  
28  
29 for healthcare affects individuals' decision to participate in the NHIS. The findings  
30  
31 point to an extensive reliance on informal support arrangements to finance  
32  
33 healthcare among low-income households in the study community. Also, it found  
34  
35 less strong but suggestive evidence that perceived availability of informal financial  
36  
37 support for healthcare diminishes enrolment in the NHIS. As illustrated in the results  
38  
39 section, an increase in a person's perceived informal support networks for healthcare  
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41 and confidence in obtaining support reduced their likelihood of enrolling in the NHIS.  
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43 This finding parallels Jowett's [9] observations about the 'negative' effect of informal  
44  
45 risk sharing arrangements on insurance uptake in Vietnam. Similarly, Mladovsky et  
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47 al. [40] found that in Senegal access to privileged relations (a source of informal  
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49 support) reduced enrolment in a community-based health insurance scheme.  
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53 However, the present finding contradicts the notion that social capital as embedded  
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3 in social relations will facilitate participation in collective risk-sharing programmes  
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5 such as health insurance schemes [12].  
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9 The findings highlight the importance of informal risk sharing systems in the health  
10 insurance decisions of individuals and households in resource-poor settings. The  
11 economic literature suggests that formal health insurance and informal support for  
12 healthcare are likely to crowd out each other because they perform similar risk  
13 protection functions [8]. People choose between these formal and informal  
14 arrangements when it comes to making decision about financing healthcare and  
15 insuring against health risks. Morduch [41] had predicted that constraints associated  
16 with informal risk-sharing systems in health-related risk protection would lead to  
17 greater desire for and enrolment in formal health insurance schemes. This not well  
18 supported by the evidence of this study. As noted in the results section, even though  
19 some respondents found informal financial support to be sometimes “unavailable”  
20 “insufficient” and “irregular” they still found it to be attractive for financing healthcare.  
21  
22 Several factors accounted for the continuous reliance on informal risk sharing  
23 arrangements for financing healthcare in the study community. Firstly, informal  
24 healthcare support arrangements are nested within a broader informal social  
25 protection system, which enable individuals to unlock other forms of social support in  
26 order to meet their daily needs other than just healthcare. Secondly, there is greater  
27 flexibility with informal risk-sharing arrangements in terms of the timing, nature and  
28 size of contribution. This flexibility means that, unlike participation in the NHIS, which  
29 is based on monetary payments at specific times of the year to register or renew  
30 membership, individuals do not have to be financially rich to participate in an informal  
31 risk-sharing scheme; their contribution can be made in kind and at a time convenient  
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3 to them. Thirdly, informal risk-sharing arrangements are embedded within the  
4 cultural fabric of society, which, unlike the NHIS, require little or no education for  
5 most people (who were predominantly non-literate) to comprehend and enrol. Thus,  
6 not only are informal risk-sharing arrangements considered by many households to  
7 be cost-effective, they are also perceived to be compatible with established norms of  
8 reciprocity in the community.  
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18 The significance of existing informal support systems in understanding behaviour  
19 towards formal health insurance resonates with the notion of endowment effect and  
20 status quo bias [42], which suggest that the aversion to new phenomena (e.g. NHIS)  
21 could influence individuals to stick to traditional approaches to financing healthcare  
22 despite their challenges. The study found no substantial evidence to support the  
23 dominant view in health economics that insurance uptake decisions are primarily  
24 determined by the need to avert risk and a desire for income certainty [43]. Rather  
25 than insure for precautionary reasons due to uncertainties about future health and  
26 related financial risks, most people enrolled in the NHIS because they are *certain*  
27 that they (will) need healthcare (in future) due to their current poor health condition.  
28 This supports the state-dependent utility theory and prospect theory which emphasis  
29 the role of individuals' present condition in shaping their perception about the  
30 prospects of gains and losses of health insurance [44]. Overall, study underscores  
31 the fact that existing informal support arrangements for healthcare are as important  
32 as other known socio-economic and health system determinants of insurance uptake  
33 (e.g. socio-economic status, perception of health risk, quality of healthcare and  
34 scheme management, etc.) and should be taken seriously when designing or  
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3 theorising about voluntary participation of individuals and households in social health  
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5 insurance schemes in resource-poor settings.  
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## 8 9 **Limitations**

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13 Due to data constraints, the research adopted easily accessible and measurable  
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15 variables as a proxy for informal financial support for healthcare. This may have  
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17 excluded other factors that are essential to understanding the entirety of people's  
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19 social support for healthcare. For example, the analysis did not consider differences  
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21 in the strength and value of individuals' relationship with members of their network as  
22  
23 well as the effects of other informal risk-coping mechanisms such as savings and  
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25 access to credit [45], which may all have an influence on individuals' decision about  
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27 NHIS enrolment. Secondly, the findings relate specifically to 'perceived availability of  
28  
29 financial support for healthcare'; other forms of social support such as emotional,  
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31 informational and appraisal support, which are likely to affect insurance enrolment,  
32  
33 were not considered. Thirdly, it is important to recognise that differences in cultural  
34  
35 norms and scheme design features may have impacted the findings and thus the  
36  
37 need not to over-generalise to different cultural settings and health insurance  
38  
39 programmes. Lastly, the non-experimental design of the research means that only  
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41 associational inferences should be made from the findings. The findings do not in  
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43 any way suggests causal relationship between the explanatory variables and NHIS  
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45 enrolment.  
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## 51 52 **Conclusions**

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3 To contribute to the broader discussion on the determinants of health insurance  
4 uptake in resource-poor settings, this study found less strong by indicative evidence  
5 that suggests that informal risk-sharing mechanisms in the form of financial support,  
6 commonly employed by low-income households to finance out-of-pocket healthcare  
7 payments, may have a detrimental effect NHIS enrolment by reducing uptake. It  
8 finds that individuals may be less willing to insure if they believe that they are likely to  
9 obtain financial support from members of their social networks to pay for care when  
10 they are ill. This is partly because such informal support arrangements crowd out the  
11 value of the NHIS and are relatively more flexible, affordable and socio-culturally  
12 significant. The findings suggest the need for theory and practice on the demand for  
13 health insurance in resource-poor settings to consider the role that existing informal  
14 risk-sharing systems play in shaping people's behaviour towards enrolment in formal  
15 health insurance schemes.

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33 Measures aimed at improving NHIS enrolment should consider making the scheme  
34 more attractive than other existing healthcare financing arrangements including  
35 informal risk-sharing systems. These measures may include addressing the  
36 administrative bottlenecks in membership registration and renewal, improving the  
37 modalities of premium collection and payment and improving the quality of NHIS  
38 related healthcare. Additionally, efforts should be geared towards reorienting support  
39 relations in community groups and associations to help members enrol in the NHIS.  
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### TABLE LEGEND

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37 **Table 1:** Descriptive characteristics of survey and interview respond

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40 **Table 2:** Summary of study variables for the quantitative analysis

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42 **Table 3:** Respondents social network characteristics

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45 **Table 4:** Results of a binary logistic regression predicting the odds of enrolling in the  
46 NHIS (n= 776)

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**Table 1: Descriptive characteristics of survey and interview respondents**

Characteristics	Survey (n = 776)		Qualitative interview (n = 27)	
	No. of respondents	%	No. of respondents	%
Gender				
Female	465	59.9	16	59.3
Male	311	40.1	11	40.7
Age category				
18 - 45	651	83.9	9	33.3
46 - 55	53	6.8	10	37
56 - 69	72	9.3	8	29.6
Literacy level				
Non-literate	503	64.8	17	63.0
Literate	273	35.2	10	37.0
Residential location				
Urban	425	54.8	12	44.4
Peri-urban	351	45.2	15	55.5
NHIS status				
Insured	510	65.7	13	48.1
Uninsured	266	34.3	14	51.9

**Table 2: Summary of study variables for the quantitative analysis**

Variables	Measurement/coding
<b>Dependent variable</b>	
Membership in the NHIS	0 = Uninsured; 1 = Insured
<b>Explanatory variables</b>	
Number of close family members that can be relied upon for financial support for healthcare during illness	Continuous (transformed into actual values)
Number of friends that can be relied upon for financial support for healthcare during illness	Continuous (transformed into actual values)
Number of community groups/associations that can be relied upon for financial support for healthcare during	Continuous (transformed into actual values)

illness	
Confidence in obtaining financial support from one's social networks to pay for care during illness	1 = Less confident; 2 = Quite confident; 3 = Very confident
<b>Control variables</b>	
Gender	1= Female; 2= Male,
Literacy	1 = Non-literate; 2 = Literate
Self-rated health status	1 = Poor; 2 = Fair; 3 = Good
Residential location	1 = Urban; 2 = Peri-urban
Age category	1 = 18 – 45; 2 = 46 – 55; 3 = 56 – 69
Socio-economic status (wealth quintile)	1 = Quintile 1; 2= Quintile 2; 3 = Quintile 3; 4= Quintile 4; 5 = Quintile 5
Trust in NHIS management	1 = Strongly disagree, 2 = Disagree; 3 = Agree; 4 = Strongly agree
Trust in NHIS healthcare providers	1 = Strongly disagree, 2 = Disagree; 3 = Agree; 4 = Strongly agree

**Table 3: Respondents social network characteristics**

	Number of Reported network members/groups		Network members/groups that can be relied upon for financial support to pay for healthcare		Which of your networks do you consider most useful for financing healthcare?	
	Mean	SE	Mean	SE	n	%
Close family relatives	9.0	0.87	5.1	0.11	521	67.1
Friends	5.22	0.15	2.39	0.45	244	31.4
Community association/ groups	1.1	0.26	0.55	0.13	11	1.4
TOTAL	15.32		7.95		776	100

**Table 4: Results of a binary logistic regression predicting the odds of enrolling in the NHIS (n= 776)**

Variables	Model 1 (Socio-demographic, health and perception variables)	Model 2 (model 1 variables + PIFSN index + confidence in receiving support)	Model 3 (Model 1 variables + close family relations + friends + community groups + confidence in receiving support)
	AOR (95% C.I.)	AOR (95% C.I.)	AOR (95% C.I.)
<b><u>Main independent variables</u></b>			
Index of perceived informal financial support network for healthcare (PIFSN)		0.925(0.881 - 0.972)**	
Close family relatives			0.944 (0.891 - 1.000)*
Friends			0.898 (0.773 - 1.042)*
Community groups			0.751 (0.470 - 1.200)
Confidence in receiving informal financial support (base: less confident)			
Quite confident		0.908 (0.602 – 1.370)	0.874 (0.577 - 1.325)
Very confident		0.455 (0.257 – 0.803)**	0.419 (0.234 - 0.749)**
<b><u>Control variables</u></b>			
Gender (base: female)			
Male	0.365 (0.253 - 0.528)***	0.374 (0.258 - 0.542) ***	0.376(0.258 - 0.548)***
Literacy (base non-literate)			
Literate	2.176(1.498 - 3.162)***	2.105 (1.446 - 3.066)***	1.958(1.339 - 2.863)**
Socio-economic status (base: quintile 1 - lowest)			
Quintile 2	2.177 (1.256 - 3.773)**	2.010 (1.153 - 3.504)*	2.013 (1.142 - 3.548)*
Quintile3	2.676 (1.662 - 4.312)***	2.648 (1.641 - 4.274)***	2.588 (1.587- 4.218)***
Quintile 4	4.132 (2.444 - 6.986)***	4.386 (2.579 - 7.460)***	4.011(2.308 - 6.970)***
Quintile 5 (highest)	6.492 (3.679 - 11.458)***	7.236 (4.048- 12.934)***	6.409 (3.512 - 11.694)***
Self-rated health status (base: Poor - lowest)			
Fair	2.734 (1.495 - 5.002)**	2.653 (1.437 - 4.897)**	2.061 (1.076 - 3.945)*
Good	1.127 (0.599 - 2.120)	1.194 (0.629 - 2.269)	0.858(0.424 - 1.736)
Trust in NHIS scheme management (Strongly disagree)			
Disagree	3.902 (1.878 - 8.105)***	3.710 (1.777 - 7.746)***	3.695(1.765 - 7.736)**
Agree	3.847 (1.924 - 7.692)***	3.503 (1.738 - 7.059)***	3.693(1.825 - 7.473)***
Strongly Disagree	3.990 (1.735 - 9.174)**	4.014(1.731 - 9.306)**	4.331 (1.855 -

				10.108)**
Trust in NHIS healthcare providers (Strongly disagree)				
Disagree	2.792 (1.031 - 7.564)*	3.161 (1.171 - 8.533)*	2.810 (1.057 -7.938)*	
Agree	4.217 (1.636 - 10.867)**	4.620(1.804 - 11.835)**	4.444(1.708 - 11.566)**	
Strongly Disagree	6.601 (2.262 - 19.259)**	6.658 (2.295- 19.311)***	6.116 (2.062 - 18.136)**	
<b>Statistical tests</b>				
Nagelkerke R2	0.247	0.267	0.271	
Block Chi square (sig)	152.820 (.001) df=14	166.413 (.001) df=17	169.385(.001) df=19	
Sensitivity	90.8	90.2	88	
Specificity	43.6	43.2	44.4	
Percentage correctly classified	74.6	74.1	73	

\* p<.05; \*\* p<.01; \*\*\* p<.001