



Willingness to Pay for Community-based Health Insurance and its Correlates among Households in Wukro and Setit-humera Towns, northern Ethiopia: A Cross-sectional Study

Goitom Gigar¹, Gebremedhin Berhe Gebregergs^{2*}, Estifanos Gebremeskel¹, Atakilti Abrha³ and Berihu Mesfin¹

¹ Tigray Regional Health Bureau, Mekelle, Ethiopia.

² School of Public Health, College of Health Sciences, Mekelle University, Mekelle, Ethiopia (*bgebrish04@gmail.com).

³ Ethiopian Health Insurance Agency, Addis Ababa, Ethiopia.

ABSTRACT

The study aimed to assess willingness to pay for community-based health insurance and its correlates among households in Wukro and Setit-humera towns, Tigray, Northern Ethiopia for the year 2016. A community-based survey was conducted in Wukro and Setit-humera towns of the Tigray region from August 30 to October 05, 2016. A total of 823 households were enrolled using a two-stage sampling. A structured, pre-tested, and interviewer-administered questionnaire was used. Data were entered and analyzed using SPSS version 20. Frequencies, mean, and median were calculated. Bivariate and multiple variable logistic regressions were fitted. Odds Ratio with 95% CI was used to see the associations between selected independent variables and the outcome variable. Willingness to pay for community-based health insurance (CBHI) in the two towns was 93.4% with 95% CI (91.6-95.0). The median amount of money that households are willingness-to-pay (WTP) was 11.1 USD. The mean amount of money an individual household is willing to pay was significantly higher in Setit-humera than in Wukro town. Participants who knew their monthly income were two times more likely to be willing to pay for CBHI [Adjusted odds ratio (AOR) =2.6, 95% CI; 1.1, 8.1]; and willingness was higher among households who perceived that the cost of care is affordable in health facilities [AOR=2.6, 95% CI; 1.02, 7.1]. The study has shown a high level of willingness to pay for health insurance. Perceived affordability and knowledge of monthly income were significant factors that affect willingness to pay for community-based health insurance. Therefore, it can be operationalized in urban settings provided that the community is aware and sensitized focusing on the benefits of health insurance. Besides, the premium needs to be carefully set to consider the community's ability to pay.

Keywords: Community health insurance, Urban, Willingness to pay, Tigray, northern Ethiopia.

1. INTRODUCTION

Globally, 32% of health expenditure was out-of-pocket spending (WHO, 2015). In Sub-Saharan Africa, people pay 60.2% of their health costs directly to healthcare providers out of their own pockets. The problem is serious in Ethiopia in which the out-of-pocket (OOP) expenditure goes as high as 78.1% (World Bank, 2017). In many countries, the burden of OOP spending is lowering

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health services utilization. Furthermore, people who use health services may need to cut spending on basic needs such as food, clothing, housing, and children's education to meet health costs (OECD, 2011).

Different literature revealed that many people are willing to be enrolled and pay for Community Based Health Insurance (CBHI). In Nigeria, the willingness ranged from 40 % to 72.7% (Onwujekwe et al., 2010; Oyibo et al., 2015), and in East Africa, it ranges from 10% in Kenya to 74% in Rwanda (Kimani et al., 2012; Ina et al., 2016). However, the mean willingness-to-pay (WTP) amount is low and depended on many factors such as socioeconomic status, geographic differences, and past health expenditure for health care (Onwujekwe et al., 2010; Dong et al., 2005). There are desirable effects of extending health insurance coverage in many low-income countries. This is because it reduces child work in the presence of parental health shocks in Rwanda, and the scheme mitigates the health shocks effect of economic reforms on poor rural households in Ethiopia (Asfaw et al., 2004; Woode et al., 2017).

In two years of scheme operation in Ethiopia, the CBHI uptake rate was 48 percent. At the same time, 82 percent of insured households renewed their subscriptions, and 25 percent of those who had not enrolled in the first year joined the scheme a year later (Mebratie, 2015). In June 2014, CBHI scheme enrolment reached 52.4%, of which 44% were fee-paying and 8.4% received a waiver (Ethiopian Health Insurance Agency, 2014).

In Tigray, Ethiopia, CBHI is already introduced in more than 20 districts and efforts are in progress to scale up region wide. Previously, the willingness to CBHI and its determinants in a rural community of Ethiopia have been investigated (Yilma et al., 2014; FMOH, 2011, Mebratie, 2015; Ethiopian Health Insurance Agency, 2014; Obse et al., 2015). While there is a reason to believe that households in different contexts are volunteering to be enrolled in health insurance, determining the existence of willingness in the urban community is conceivable of great interest. Thus, the present study is developed to assess the willingness to pay for community-based health insurance and its correlates among households in the urban community of Wukro and Setit-humera, Tigray, Ethiopia.

2. METHODOLOGY

2.1. Study Design, Setting, and Population

A community-based cross-sectional study was carried out in Wukro, and Setit–humera, Tigray, northern Ethiopia from August 30 to October 05, 2016. Wukro had a total population of 47611 in 10800 households. There were 4232 registered traders in the town. In Setit-humera, there were 7794 households. It had a population of size of 34295, and 2585 traders. All households in the two urban districts were our study population. We interviewed heads of households that live for more than 6 months in the study area.

2.2. Sample Size and Sampling Technique

We used a multi-stage (two-stage) sampling technique. Of the 12 urban districts in the region, we included Wukro and Setit-humera purposively as they were the pilot areas selected for the implementation of community-based health insurance. First, two kebeles were selected randomly from each district. Next, households were selected using the lottery method from the selected kebeles in both districts. Four hundred twenty and 403 heads of households responded to the study in Wukro and Setit-humera, respectively. The overall response rate was 97.8%. We calculated the sample size using a single population proportion formula. We used a CBHI scheme enrolment rate, $P= 52.4\%$ (Ethiopian Health Insurance Agency, 2014), 95% confidence level, and 5% degree of precision. Multiplying by the design effect of two and adding 10% for the non-response rate, the last sample size was 841. For a single population proportion, the formula to calculate the sample size is written below.

$$n = \frac{\left(\frac{Z_{\alpha}}{2}\right)^2 p(1-p) def}{d^2}$$
; where n =sample size; d = degree of precision; $\left(\frac{Z_{\alpha}}{2}\right)$ = z score for 95 % confidence level; p =proportion; def = design effect.

$$n = \frac{(1.96)^2(0.524)(0.476)*2}{0.05^2} = 765$$
, then (10% none-response rate) $=765 \times 0.10 = 76$. The final sample size was then: $n_f = 765 + 76 = 841$

2.3. Data Collection Tool and Procedure

Data were collected using face-to-face interview techniques to collect information from each household. We used a structured and pre-tested questionnaire. The questionnaire was prepared in English and then translated into Tigrigna. Eighteen health professionals who have a Bachelor of Science were recruited from health facilities as data collectors. The head of each household was

interviewed. Data collectors and supervisors were trained for two days mainly on how to properly fill out the questionnaire, data collection techniques, and the purpose of the study. The study team supervised the data collection process.

2.4. Data Processing and Analysis

Data were coded on the pre-arranged coding sheet by the study team. We cleaned and edited it manually. Data were entered and analyzed using SPSS version 20. For normally distributed continuous data, results are presented using the mean \pm standard deviation (SD), while for the skewed data, results are presented using the median (interquartile range, IQR). The descriptive results of categorical variables are presented as the absolute value (n) and percentage (%). Bivariate and multiple variable logistic regressions were fitted. Binary logistic regression requires the dependent variable to be dichotomous (e.g., yes Vs no) and observations to be independent (Worster et al., 2007). Logistic regression is the appropriate regression analysis to conduct when the dependent variable is categorical (Peng et al., 2002). As a predictive analysis, it describes data and explains the relationship between one dependent binary variable and independent variables. In our case, our dependent variable is 'willingness to pay', a categorical variable coded as yes= '1' and no= '0'. The independent variables included: socio-demographic and economic factors, health-related factors, perception, and knowledge. Variables whose p-values are ≤ 0.2 during the bivariate analysis were fitted to the final multiple logistic regression model (backward step-wise) to adjust for potential confounders. In the final model, a p-value <0.05 was considered statistically significant.

2.5. Ethics Approval and Consent to Participate

Ethical clearance was obtained from the Tigray Regional Health Bureau. Permission was sought from each selected district health office. Informed oral consent was obtained from respondents as the majority of them were unable to read and write. Enumerators explained the study objective to all participants. All the information obtained from the respondents was treated as private and confidential.

3. RESULTS

3.1. Socio-demographic and Economic Characteristics of Respondents

A total of 823 individuals were enrolled in the study. Four hundred and twenty (51%) were from Setit-humera and 403(49%) were from Wukro town. Females comprised 449 (54.6%) and the

majority, 757(92%) were Orthodox Christian. The average family size in the household was 4.2. The mean age of respondents was 39.6 years (SD±13.2 years). A quarter of the participants, 209 (25.6%), were in the age range of 18-29 years and 245 (30%) were in 30-39 years. More than half of the participants were married 476 (57.8%). Five hundred seventy-three (69.7%) were illiterate (Table 1).

Table1. Socio-demographic characteristics of respondents in 2016.

<i>Variable</i>	<i>Category</i>	<i>Frequency</i>	<i>Percent</i>
Sex	Female	449	54.6
	Male	374	45.4
Age	18-29	209	25.5
	30-39	245	30.0
	40-49	184	22.5
	≥50	180	22.0
Marital status	Married	476	57.8
	Single	115	14.0
	Divorced	151	18.4
	Widowed	81	9.8
Religion	Orthodox	757	92.0
	Muslim	61	7.4
	Catholic	2	0.2
	Protestant	3	0.4
Educational status	Illiterate	573	69.7
	Literate	250	30.3
District	Wukro	420	51.0
	Setit-humera	403	49.0
House ownership	Owner	371	45.7
	Rented	414	51.1
	Dependent	26	3.2

One out of ten participants had no work at the time of data collection and 43.6% are engaged in sales and services. More than half (58.3%) of the respondents knew their family monthly income, and the median monthly income was 66.7 USD (Interquartile Range (IQR) = 72.2 USD). Likewise, only 31% were a member of a local saving organization (Idir), of which 228 (27.7%) respondents saved a median of 6.7 USD (IQR=5.2 USD) per year (Table 2).

3.2. Health-related Characteristics of Respondents

Of the total, 113 (13.7%) had a family member with a chronic illness. Neuromuscular disorder (23.3%), kidney disease (21.4%), and tuberculosis (17.5%) were the most common diseases mentioned by heads of households. A hospital was the commonest (72.4%) place of care for people with chronic illness (Table 3). Among 395 (48.2%) respondents, at least one of their family members had an illness in the year 2016 (Table 3).

Table 2. Socioeconomic characteristics of respondents in 2016.

<i>Variable</i>	<i>Category</i>	<i>Frequency</i>	<i>Percent</i>
Occupation	Sales and services	354	43.6
	Unskilled manual	177	21.8
	Other	169	20.8
	No work/unemployed	72	8.9
	Skilled manual	21	2.6
	Professional/technical/managerial	19	2.3
Know monthly income	No	332	41.7
	Yes	465	58.3
Family monthly income	≤ 38.9 USD	119	25.6
	39.0 – 66.7USD	120	25.9
	66.8 – 111.1 USD	108	23.3
	≥111.2 USD	117	25.2
Member of a local saving organization (Idir)	No	509	69.0
	Yes	228	31.0
Amount of money saved per year	≤ 3.3 USD	84	38.1
	3.4-6.7 USD	77	35.0
	6.8-8.5 USD	3	1.4
	≥8.6 USD	56	25.5

Note: 1USD = 18 ET Birr at the time of data collection

Table 3. Health-related characteristics of respondents in 2016.

<i>Variable</i>	<i>Category</i>	<i>Frequency</i>	<i>Percent</i>
Presence of a family member with chronic illness	No	710	86.3
	Yes	113	13.7
Type of chronic illness (n=103)	Neuroma- muscular disorders	24	23.3
	Kidney disease	22	21.4
	Tuberculosis	18	17.5
	Mental illness	14	13.6
	Asthma	7	6.8

	Cardiovascular disease	7	6.8
	Diabetic	6	5.8
	HIV	4	3.8
	Cervical cancer	1	1.0
Place of care for chronic illness	Hospital	76	72.4
	Health Center	8	7.6
	Private Facility	19	18.1
	Other	2	1.9
Paid for medical care of chronic illness	No	48	41.0
	Yes	69	58.1
Illness in family member in 2016	No	425	51.8
	Yes	395	48.2
Medical care sought at	Nowhere	2	0.3
	Hospital	282	41.2
	Health center	99	14.5
	Private facility	67	9.8
	HC and hospital	96	14.0
	Hospital & private facility	79	11.5
	HC & private facility	9	1.3
	All the above	50	7.4
Cost of care covered by	Self	620	89.9
	Waived	70	10.1
Perceived affordability	No	243	39.7
	Yes	369	60.3

Note: HC= Health center.

Table 4. Descriptive result of selected scale variables among respondents in 2016.

<i>Scale variables</i>	<i>Median (USD)</i>	<i>Interquartile range</i>
Monthly income	66.7	72.2
Saved money in Idir	6.67	5.2
Cost of medical care	11.1	28.9
WTP Premium in Wukro	7.8	5.5
WTP Premium in humera	16.7	16.7
WTP Premium (total)	11.1	15.6

Note: WTP= Willing To Pay.

As it is shown in table 4, the median amount of money paid for one medical care of chronic illness, as an OOP expenditure, was 11.1 USD (IQR = 28.9). During the investigation of the cost of medical care for any illness (health problem) in the household, the median (IQR) cost for one

medical care in public and private facilities was 5.6(5.3) and 22.2(22.2) USD, respectively. For respondents who used both facilities, the median (IQR) cost for one medical care was 16.7(29.4) USD. Only 10 of the 305 (3.3%) respondents knew that the cost of care for their family was waived. Seventy-nine (9.7%) had missed medical care due to a lack of money.

3.3. Willingness to Pay for Health Insurance

In combination, the overall proportion of willingness to pay for CBHI in the two towns was 93.4% with a 95% CI (91.6-95.0). In Setit-humera, 97.8% of the household heads were willing to pay for community-based health insurance, and in Wukro, the willingness to pay was 89.3%. Little variation was observed among men and women: 94.4% Vs 92.7%, respectively. Among the willing individuals, 65.2 % of them want to pay annually and 34.8% want to pay twice a year (Table 5). The median amount of money participants can pay for the CBHI was 11.1 USD (IQR=15.6 USD). There was a significant difference in the median WTP money (p-value≤0.001) between the districts. Respondents would like to pay a similar amount of money if the government decided it.

Table 5. Willingness and amount of money individual households can pay per annum in 2016.

<i>Variable</i>	<i>Category</i>	<i>Frequency</i>	<i>Percentage</i>
Willing to Pay	No	54	6.6
	Yes	769	93.4
Amount of money an individual is WTP	≤6.7 USD	188	22.8
	6.8-11.1 USD	210	25.5
	11.2-22.2 USD	174	21.1
	≥22.3 USD	143	17.4
	Did not mention	54	6.6
Frequency preferred to pay	Annual	497	65.2
	Biannual	265	34.8

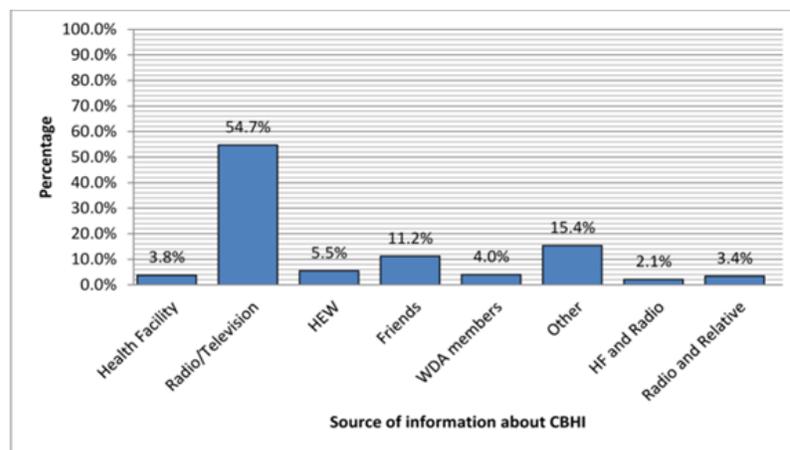


Figure 1. Source of information about community-based health insurance for participants in 2016.

More than half, 57.6% (469/814), of the respondents heard about health insurance. The main sources of information were radio/television (54.7%) and friends (11.2%) (Fig 1).

3.4. Correlates of Willingness to Pay for Community-based Health Insurance

In multivariable logistic regression perceived affordability and knowledge of monthly income had statistically increased willingness to pay for community-based health insurance (Table 6).

Table 6. Factors Associated with Willingness to Pay for Health Insurance in 2016.

<i>Variables</i>	<i>Willing to Pay</i>		<i>COR (95% CI)</i>	<i>AOR (95% CI)</i>
	Yes	No		
Sex				
Female	416	33	0.7 (0.3, 1.3)	0.5 (0.2,1.4)
Male	353	21	1	1
District				
Wukro	375	45	1	1
Setit-humera	394	9	5.3 (2.5, 10.9) *	(1.8,0.5,6.2)
Perceived affordability				
No	226	17	1	1
Yes	360	9	3 (1.3, 6.9) *	2.6(1.02,7.1) *
Know monthly income				
No	304	28	1	1
Yes	449	16	2.6 (1.4,4.9) *	2.1(1.1,8.1) *
Illness of a family member				
No	391	34	1	1
Yes	375	20	1.6 (0.9-2.9)	1.2 (0.4,3.3)
Heard about health insurance				
No	318	27	1	1
Yes	446	23	1.6 (0.9-2.9)	2.7(0.9,8.6)

Note: *Significant at $p < 0.05$; COR-Crude Odds Ratio; AOR - Adjusted Odds Ratio.

4. DISCUSSION

Lack of health insurance in developing countries impedes access to health care. Thus, CBHI has been considered an effective means to reach the poor (Donfouet, 2012). Since there has been an increased desire to extend the scheme, we investigated the willingness to pay among the urban community in northern Ethiopia.

This study showed that more than 90% of households in the two urban districts were willing to pay for community-based health insurance. This is higher than the proportion (52.4%) reported earlier by the Ethiopian Health Insurance Agency in the country (Ethiopian Health Insurance Agency, 2014) and other African countries (Kimani et al.,2012; Ina et al., 2016). But it was in line

with a study conducted in Bangladesh, where WTP for a CBHI scheme was 86.7% among informal workers (Ahmed et al., 2016). This could be linked to a difference in the study population. In our study, we examined willingness in the urban community, while others focused on either rural or both setups.

Not only the decision to be enrolled but also the amount of money WTP for the scheme is very important. In the present study, the median amount of money household WTP was 11 USD. This amount is lower than the WTP in other African countries: Cameroon and Tanzania (Donfouet et al., 2011; Macha et al., 2014). Across the countries, variations in socioeconomic status may be the likely explanation. In Nigeria, the mean WTP per person per annum was 11.24 US dollars for urban households, which is in agreement with our findings. However, there is a difference in membership. In Ethiopia, enrollment is allowed only at the household level (Mebratie 2015) whereas in Nigeria the membership decision is taken at an individual level (Bukola, 2013).

About 40% of the respondents had never heard about health insurance, although CBHI has been in operation in twenty rural districts in Tigray (Ethiopian Health Insurance Agency, 2016). In support of this, Obse et al. (2015) also reported that most participants of the FGDs in Addis Ababa were not aware of the availability of health insurance. Even, there is very limited knowledge among those who are currently insured.

Several studies have reported that affordability of premiums, low socioeconomic status, and poor quality of healthcare services offered to members, and limited referral services are major constraints to health insurance enrolment (Onwujekwe et al., 2010; Carrin et al., 2005; Bonus, 2003; Kamuzora et al., 2007). In our study, perceived affordability plays a crucial role in WTP for CBHI. The likely hood (odds) of willingness was four times higher among heads of households who perceive the cost of medical care is affordable. People who can afford to use health services frequently when they get sick. Therefore, the scheme requires regular use of orthodox means of treatment (Donfouet et al., 2011). In the current study, knowing monthly income was significantly associated with willingness to pay for health insurance, as knowledgeable household heads were two times more likely to be enrolled in the scheme. When people know their income, they might have saved money and planned expenses. In our setting, 65% of the respondents desired to pay annually. Other studies showed that households do have enough willingness to pay if the payment mode is planned, conducive, and once per year (Entele et al., 2016).

In this study, income had no relation with WTP for the CBHI scheme. On the contrary, many studies such as Onwujekwe et al. (2010); Oyibo et al. (2015); Entele et al. (2016); Bärnighausen et al. (2007) revealed a positive correlation between WTP and income. In Senegal, although community-based health insurance scheme reaches the poor in general, the poorest of the poor within the villages find it financially difficult to participate in the insurance (Jutting, 2003). Thus, social inclusion, a primary objective of the CBHI scheme, should not be overlooked.

Regarding the policy implications, the very high willingness-to-pay and the small differences in willingness-to-pay between the household head categories in table 5 seem to indicate that extending health insurance coverage is much needed in these two urban communities.

5. CONCLUSION

The study has shown a high level of willingness to pay for community health among household heads in an urban setting. The median amount of money WTP was 11 USD, and 65% of them want to pay annually. The mean willingness to pay money was significantly higher in Setit-humera than in Wukro. Nearly half of the households had never heard of community-based health insurance. Perceived affordability and knowledge of monthly income were significant factors that affect willingness to pay for community-based health insurance. The limitation of the study is that it was not triangulated by a qualitative study. Social desirability bias might occur. Respondents may not tell their exact monthly income.

6. RECOMMENDATION

We recommend intensive public awareness creation, and sensitization activities focusing on the benefits of health insurance before implementation. This is because there is limited knowledge about CBHI in the community. Premiums must be set very carefully. It must take into account the willingness and ability to pay for the community. The government should introduce a premium subsidy for the poor as households who can't afford the cost of medical care were less willing to pay for this proposed scheme.

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8. CONFLICT OF INTEREST

There is no conflict of interest.

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