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Factors Affecting the Adoption of Community Based Health Insurance among Households in *Adama* City, Ethiopia

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Journal of Agriculture and Development

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Factors Affecting the Adoption of Community Based Health Insurance among Households in *Adama* City, Ethiopia

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Abstract

The main objective of this study was to identify factors affecting the adoption of community-based health insurance among households in Adama city. The study used a cross- sectional data and explanatory research designs and mixed research approach. Structured questionnaires were used to collect primary data from 353 sample respondents, who were selected using probability sampling technique supplemented by key informant interview. Binary logistic regression model was employed to identify factors that determine the adoption of community- based health insurance in the study area. The descriptive statistics result revealed that most of (56.37%) the household heads adopted community-based health insurance. The resulting distribution on perception of community-based health insurance (CBHI) further showed that (35.69%) and (41.64%) of the respondents in the study area perceived CBHI as very good and good respectively. The regression result revealed that variables such as income, legal framework, occupation, chronic ill family member and facility preference are significantly and negatively associated with the adoption of community-based health insurance in the study area. On the other hand, higher education and drug availability significantly and positively affected the adoption of community-based health insurance in the study area. Thus, integrated effort is needed among the governmental and non-governmental organizations with full involvement of the households to enhance the adoption level of community-based health insurance. In addition, higher education and drug availability within the health facility should be strengthened that increases the likelihood of adoption of community- based health insurance.

Key Words: Adoption, Binary logit regression, Community-based health insurance, *Adama*

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Introduction

Health insurance is an emerging social security instrument for the rural poor, for whom chronic health problems, arising due to prevalence of diseases and inaccessibility to an affordable health care system. Chronic health is a major threat to their income earning capacity which leads all people aspire to receive quality and affordable health care (USAID, 2008). In 2012, the UN General Assembly calls on governments to significantly scale-up efforts to accelerate the transition towards universal access to affordable and quality healthcare service (World Bank, 2013).

According to Solomon *et al*. (2015), in the last 10 years, Africa has witnessed a renewed interest in community-based health insurance schemes as countries leverage communities to expand risk-pooling coverage to informal sectors and the rural population. FDRE Ministry of Health, (2010) in Africa the enrolment in health insurance is less than 10% but, in some countries the involvement has more than this. Specifically, Rwanda (80.9%), Ghana (32%), Kenya (25%), Senegal (18.1%) and Mali (12.1%) were covered.

The Government of Ethiopia in its Health Insurance Agency (2015) as part of its health care financing strategy in general and its health insurance strategy in particular, had endorsed and launched community-based health insurance (CBHI) schemes in 13 pilot Woredas in Amhara, Oromia, Southern Nations, Nationalities, and Peoples (SNNP), and Tigray regions in 2010/11 to provide risk protection mechanisms for those employed in the rural and the informal sectors. Three years on, triggered by the pilot's early successes, the government of Ethiopia decided to expand the pilot to 161 woredas in July 2013 (Solomon *et al*., 2015). The country experienced CBHI as one of the strategies for universal health coverage through a series of complementary

measures including national health financing so that its overall enrolment rate in the pilot districts reached approximately 52% of the target population; of which 85% are members that are going with the scheme by paying their premium.

In 2018, the enrolment reached 5.4 million in five regions. At the end of 2021, 834 Woredas in Ethiopia have started community-based health insurance scheme and health services using CBHI. In the 834 Woredas where health care service provision with community-based health insurance is started (excluding Tigray region), 8,700,359 (61%) of the total eligible households were enrolled into the CBHI program. From the total 8,700,359 household members 7,038,647 (81%) are paying members. Household membership in 2021 has increased from 49% in 2020 to 61% in 2021 (FDRE MoH, 2021). Therefore, this study aims to identify the determinant factors affecting the adoption of community-based health insurance among households in *Adama* city, Ethiopia.

People demand high quality health care service, but there is poor utilization of health care services in several countries due to low accessibility and quality of health care service. Thus, community health insurance might improve access to acceptable quality health care (WHO, 2010). Lack of health insurance decrease the health care seeking of the community which contributes to low coverage of health care. Community-based health insurance enables the government to focus on secondary and tertiary health care; which means secondary care focus on the curative aspect and tertiary care focus on the preventing of gaining complication due to the disease which was happened. This contributes to increase the accessibility of health care service by enhancing financial capacity and to increase the quality of health care delivery system.

Studies were conducted on community-based health insurance. Some of the studies are descriptive studies (Anagaw *et al.,* 2014; Tilahun *et al*., 2018) without applying econometric models. There is also variable inconsistency among findings of studies. Panda *et al*. (2016) found that knowledge of insurance, quality of healthcare, trust in scheme management are enablers of community-based health insurance, whereas, inappropriate benefits package, cultural beliefs, affordability, distance to health care facility, lack of adequate legal frameworks are barriers to community-based health insurance. Further, Hassen *et al.* (2021) found that family size, presence of frequently ill individual and presence of chronic illness were positively associated with CBHI, whereas poor quality of care, lack of managerial commitment, trust and transparency, unavailability of basic supplies are barriers of community-based health insurance enrolment. The other research gap identified is that, their limitation to apply data analysis model to identify the determinant factors among studies. However, there are still gaps which need further investigation in relation to the factors affecting the adoption of community-based health insurance in *Adama* city, Ethiopia. Therefore, this study is aimed to answer the questions: What is the current status of adoption and the level of household perception on the adoption of CBHI in *Adama* city? What are the major factors affecting the adoption of CBHI in the study area?

The general objective of this study was to identify factors affecting the adoption of community-based health insurance among households in Adama city, Ethiopia. It was guided by the following specific objectives:

1. To assess the current status of households' adoption of community-based health insurance in the study area;
2. To assess households' perception towards the adoption of community-based health insurance in *Adama* city; and

3. To identify factors affecting the adoption of community-based health insurance in the study area.

Theoretical Framework: CBHI Scheme in Ethiopia

In Wagner and Degnan (2009), the term insurance refers to all types of health insurance programs, including private, public, for profit and not-for-profit programs and organizations, particularly, those which include the poor. Health insurance programs pool risks across populations and pay part of or all health-care expenses for their defined population of members from premiums contributed by individuals, employers, non-governmental organizations and/or government. The services and goods covered by health insurance programs vary widely. The medicines benefit would be provided in addition to coverage of basic health care services; we are not considering schemes that cover only medicines.

Hounton *et al*. (2012) examined CBHI is a type of insurance meant for informal sectors through contributing some amount of money that is owned, designed and managed by the members. The scheme is a not-for-profit type of health insurance that has been used by poor people to protect them against the cost of seeking medical treatment for illness. It is mainly financed by the contributions or premium regularly collected from its members. It is based on the premises of risk-pooling and community solidarity to risks of falling sick and conceptually designed to provide financial protection and reduce out of pocket payment for health care. Providing this financial protection, CBHI schemes could potentially increase access and utilization of health service and thus increase antenatal care and institutional delivery.

Nguhiu *et al*. (2021) in their examination found that only four countries had coverage levels with any type of health insurance of above 20% (Rwanda 78.7%, Ghana 58.2%, Gabon 40.8% and Burundi 22.0%). Overall, health insurance coverage was low (7.9%) and pro-rich; concentration index=0.4 (95% CI 0.3 to 0.4, p<0.001). Exposure to media made the greatest contribution to the pro- rich distribution of health insurance coverage (50.3%), followed by socio-economic status (44.3%) and the level of education (41.6%).

According to the Ethiopian Health Insurance Agency (2015), there is no one size fits all strategy for implementing risk-pooling mechanism. Some countries have used top-down public financing and social health insurance without CBHI, while others have used CBHI as the main model of reaching the informal sector. As a result of these differences in design, country experiences show huge variation in the breadth, depth, and height of coverage achieved. Successful CBHI models show that there are important conditions for CBHI to grow and develop, including: existence of a minimal level of (perceived) quality of care and gradual improvement of quality at the supply side; instituting adequate organizational practice and design including responsiveness to people's felt needs by the scheme management; government commitment and political will with clear action plans, national scope of implementation, existence of regulatory frameworks, and the unequivocal commitment to subsidize and finance the premium for the poorest in society and the need for CBHI schemes to join forces to expand risk pooling and ensure financial sustainability.

The CBHI is a participatory decision making and management structures; they might be more transparent and accountable and enhance community empowerment as well as the voice of the community. The other controversy

in their favour is that they can help built trust and encourage familiarity with the concept of health insurance (WHO, 2010).

CBHI Implementation in Ethiopia

In Ethiopia, the CBHI initiative was set up as a community-based health project that gathers payments made by members into fund, which covers basis health care costs, thus members are enabled access at local health care centers whenever they are sick. CBHI stems from the Ethiopian Federal Ministry of Health's effort to reach universal health coverage by improving overall financial protection for health care. Again, CBHI, in Ethiopia, targets the government aim of improving healthcare in the country by implementing a policy that adequately mobilizes domestic resources and improves access to quality healthcare. This was primarily due to high cost of services, especially for families who could not afford to pay these rates at once. Thus, the CBHI initiative was adopted as a means for families to have better financial protection for healthcare and increase the willingness of members of the community to seek modern health facilities more frequently (Tilahun *et al*., 2018) and (Umeh and Feeleya, 2017).

Conceptual Frame-work

From the theoretical and empirical literature review, it is observed that adoption of CBHI is influenced by factors that can reasonably grouped into demographic, socio-economic and other factors need to understand. To align the conceptual framework with the research objectives, adoption of CBHI is the dependent variable and the independent variables. The conceptual frame work for this study is shown in Figure 1.
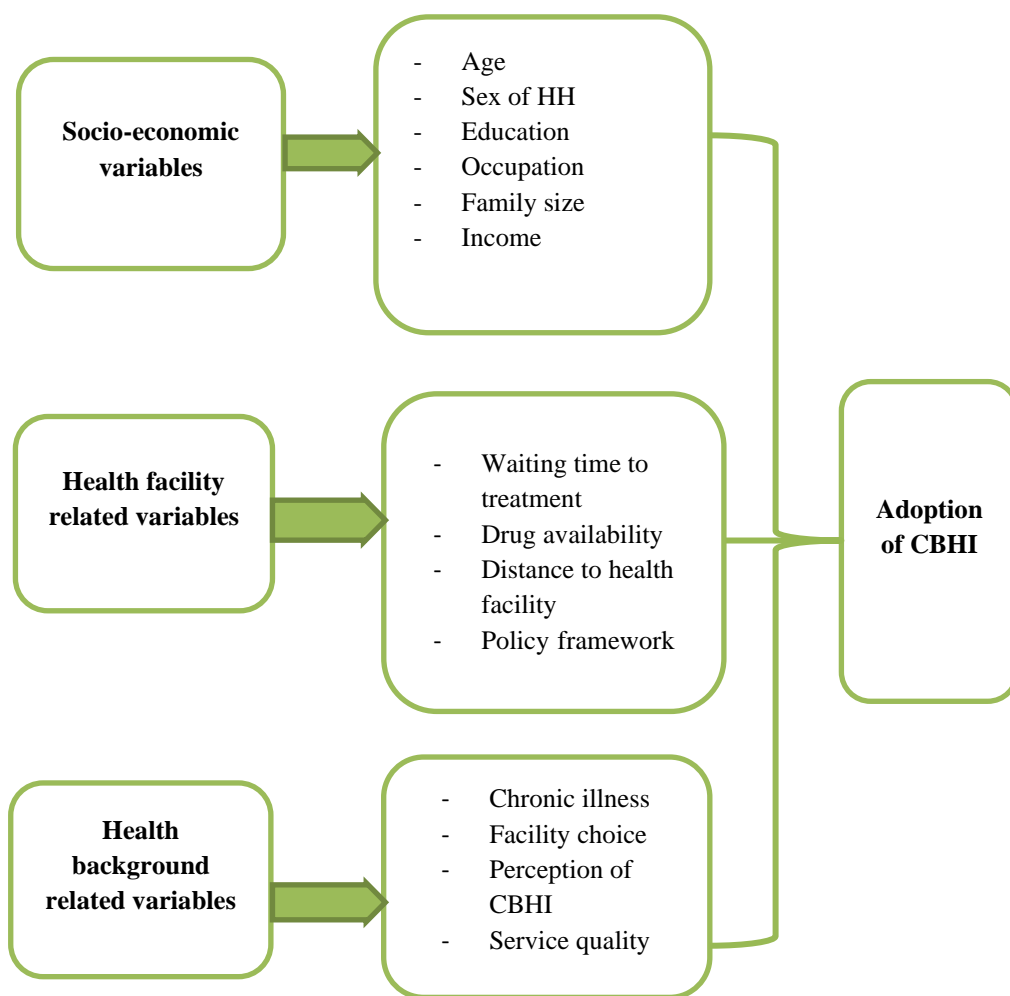
Figure 1. The conceptual frame work for this study (2021)

Research Methods

This study used a cross-sectional, survey descriptive research designs in order to assess the status of household's adoption of community-based health insurance and their perception towards community-based health insurance

among households in *Adama* City Administration. Explanatory research design was also used to critically examine the factors affecting the adoption of community-based health insurance in the study area. The study employed mixed research approach.

Both probability and non-probability sampling techniques were used to determine the sample households and select the study area. According to *Adama* City Finance Office (2020), the city is divided by six sub-cities which have 60,100 household heads. Therefore, the study applied multistage sampling technique. In the first stage *Adama* city is selected purposively which has six sub cities (*Aba geda* sub-city, *Denbela* sub-city, *Bole* sub-city, Lugo sub-city, *Dabe* sub-city and *Boku* sub-city and 60,100 household heads. In the second stage, three sub-cities (*Aba Geda* sub-city, *Denbela* sub-city and *Lugo* sub-city are selected randomly to understand the current status, household perception and identify determinant factors of CBHI in the study area. In the third stage, since all sub cities and *Kebeles* have almost similar characteristics in socio-economic and cultural practices, three *Kebeles* (*Gurmu* from *Abageda*, *Degaga* from *Denbela* and *Bika* from Lugo sub cities) one from each sub-city were selected randomly through lottery system, considering the time and cost limitations of the researcher. Thus, three *Kebeles* were selected randomly with a total of 6,129 household heads formed the base for sampling frame in this study.

From the study population of 6,129 households, the sample size was determined based on Yamane (1967) simplified formula assuming a 95% confidence interval and p = 0.05 level.

$$n = \frac{N}{1+N(e)2} \qquad\qquad n = \frac{6,129}{1+6129(0.05)2} = 375$$

Where ´n´ is the sample size, ´N´ indicates the size of population, and ´e´ is the level of accuracy.

Since, the target population is less than 10,000 the desired sample size is adjusted using finite population correction formula. Because a given sample size provides proportionately more information for a small population. Thus, the sample size is adjusted as follows:

$$fn = \frac{n}{1+\frac{n-1}{N}} \qquad\qquad fn = \frac{375}{1+\frac{375-1}{6129}} = 353$$

Where: N= the target population size, fn = The adjusted sample size, n = the sample size

Therefore, the sample size of the study was made to be 353 household heads. After calculating the sample size n, then the sample size for each kebele using proportional allocation formula was determined as follows.

Table 1. Sampling proportion

No	Kebele	Households	Sample size determination by proportion	Samples taken
1	*Gurmu Kebele*	2,285	*Gurmu Kebele* $(n_1) = \frac{N\ N_1}{N} = \frac{353*2285}{6129}$	131.6
2	*Degaga Kebele*	1,800	*Degaga Kebele* $(n_2) = \frac{n\ N_2}{N} = \frac{353*1800}{6129}$	103.6
3	*Bika Kebele*	2,043	*Bika Kebele* $(n_3) = \frac{n\ N_3}{N} = \frac{353*2043}{6129}$	117.6
Total		6129		353

Source: Field survey, 2021

As per Bhattacherje (2012), systematic sampling technique involves a random start and then proceeds with the selection of every k^{th} household head from that point onwards (k = N/n), where k is the ratio of sample frame size ´N´ and desired sample size ´n´. Hence, this study used this method to select every

17th household head from "K*ebele*" name list in three "*Kebeles*" until the total sample size of the study reached.

The study used both primary and secondary data sources. The primary data were collected from sample household heads using structured questionnaires and through KII from key informants in the study area. Structured questionnaires were prepared to collect cross sectional data from primary sources and translated to *Oromifa* which is the working language of the study area. The secondary sources of data were published and unpublished materials, manuals, journals, sectorial reports, previous researches, websites and regulations in relation with this study were reviewed well.

The collected data were analysed quantitatively and qualitatively. The statistical analysis took a form of descriptive and inferential statistics. The descriptive statistics such as frequency, percentage, mean and standard deviation were used to measure the status of adoption and level of household perception towards CBHI. Binary logistic regression was employed to estimate the level of determination of independent variables on the dependent variable. Then the collected data has been entered, cleaned and analysed using STATA data analysis tool.

Model Specification

Binary logistic regression was used to investigate the factors influencing the adoption of CBHI. This model is a statistical technique for predicting probability of an event, given a set of predictor variables. Community-based health insurance is a binary variable, best measured in terms of adoption of CBHI by the households.

Logistic regression was used to predict the propensity of adoption of CBHI on the basis of independent variables and to determine the effect size of the independent variables on the dependent variable and to understand the magnitude of the effect of predictor variables. The effect of predictor variables is usually explained in terms of odds ratio and hence the name logistic regression, also called the log-odds function. This model applies maximum likelihood estimation after transforming the dependent variable into a logit variable (the natural log of the odds of the dependent variable occurs or does not occur). Binary logistic regression is one part of logistic regression which is predictive model that can be used when the outcome variable is categorical variable with two choices and the independent variables are of any type.

Binary logistic regression has other application of combining the dependent variables to estimate the probability that particular event will occur, that is a subject which would be a member of one of the groups defined by the dichotomous dependent variable. Due to the above-mentioned issues, binary logistic model of adoption of CBHI in this study is specified as:

$$P_i = \frac{e^{\beta_o + \beta_1 X_1 + \cdots + \beta_k X_k}}{1 + e^{\beta_o + \beta_1 X_1 + \cdots + \beta_k X_k}} = \frac{e^{X'\beta}}{1 + e^{X'\beta}}$$

Where, P_i = is the probability of adoption

Hence, the logit transformation of P_i given as follows:

$$logit(P_i) = log\left(\frac{P_i}{1 - P_i}\right) = \beta_o + \beta_1 X_1 + \cdots + \beta_k X_k$$

Where

P_i: is the probability of adoption, β_0: is *the intercept term,* β_i: *the coefficient of xi*

X_i: *are the explanatory variables*

A logistic regression model used to determine the relationship between a binary outcome   dependent variable and a group of predictor variables. More formally, let **y** be the binary outcome variable indicating adopter/non adopter with 1/0 and p be the probability of y to be 1,

$$P = prob \ (y = 1).$$

Let x1... x10 be a set of predictor variables. Then the logistic regression of y on x1... x14 estimates parameter values for β0, β1. . . β14 via maximum likelihood method of the following equation.

$$logit(p) = \log \ (p/(1-p)) = B_{0+} \ B_1 * X_1 + \cdots + B_{10} * X_{10}$$

Given the above stated model of binary logistics regression, the likelihood of the farmers to adopt CBHI is given by the expression $p_i = \frac{1}{1-e^{-z_i}}$ where $z_i = \beta_1 + \beta_2 X_i$ while the probability of not adopting CBHI is given as $1 - p_i = \frac{1}{1 + e^{z_i}}$.   Hence, the log of the odds ratio is the natural log of the two probabilities i.e. $(\frac{p_i}{1-p_i})$ (Gujarati, 2004).

Table 2. Variable Definitions, Measurement and Expected Signs

Variable	Definition of variables	Measurement	Expect sign
Dependent variable			
Adoption of CBHI	Adoption of CBHI among households (1 if adopter, 0 otherwise)	Binary	
Independent variable			
Age	Age of the household head in years	Continuous	+
Sex	Sex of the household head; 0=male 1=female	Categorical	-
Educational level	Finalized school grading	Continuous	+
Family size	Number of family members in the house	Continuous	+
Occupation	The types of works which did by household head	Categorical	+
Income	Per capita income per month in ETB for the household	Continuous	+
Chronic illness	Being long-lasting and characterized by long suffering	Categorical	+
Waiting time to service	Adopters waiting time to treatment in health facility/minutes	Continuous	-
Drug availability	Availability of essential drugs in health facility (1 if fully available, 0 otherwise)	Binary	+
Distance to health facility	Distance to CBHI identified health facilities in minutes	Continuous	-
Policy framework	Households' knowledge of CBHI policy frameworks (1 if you know policy framework, 0 otherwise)	Binary	+
Perception on CBHI	Household heads perception about CBHI	Categorical	+
Service Quality	Health service quality at CBHI health facilities	Categorical	+
Facility Choice	Households' preference to get service other than CBHI facility (1 if you need other health facilities, 0 otherwise)	Binary	-

Source: Literature review, 2021

Results and Discussion

Socio-Economic Characteristics

The study surveyed 353 sample respondents through survey questionnaires which makes the response rate 100% without default from the expected sample size. The results presented in this study were based on this number of sample respondents from the study area. Looking first to the age of respondents, the table shows that, the average age was 41.03 years with standard deviation of 10.29 from the mean age of the respondents. The result indicated that most of the respondents were adults given the mean value of age with its average variation. When the age variation is considered, the respondents have a huge difference in age where the minimum age was 20 years while the maximum age was 70 years. The wide gap in age between sampled respondents enables to better understand the adoption of CBHI among households.

 The result also indicated that, the average family size of respondents was nearly 4 members with standard deviation of 1.31 from the mean family size of the respondents. The result indicated that most of the respondents of the study were nuclear family given the mean value of family size with its average variation. When the family size variation is considered, the respondents have a reasonable difference in their family size where the minimum family size was two members while the maximum respondent family size has six members.

Table 3. Respondents age, family size and income distribution

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	353	41.04	10.29	20	70
Family size	353	3.93	1.31	2	6
Income	353	4,951.50	993.34	3600	8500

Source: Survey, 2021

The result from descriptive statistics indicated that, the average monthly income of respondents was 4,951.50 birr with standard deviation of 993.33 from the mean monthly income of respondents. The result indicated that most of the respondents have low income given the mean value of monthly income with its average variation. When the income variation is considered, the respondents have a reasonable difference in their income where the minimum monthly income was 3,600 Birr while the respondent's maximum monthly income was 8,500 Birr.

The Adoption Status of CBHI in the Study Area

The result from descriptive statistics on the adoption status of community-based health insurance distribution of respondents in the study area is presented in Table 4. The result in Table 4 related to the adoption status of community-based health insurance indicates that, most of the respondents contributing about (56.37%) adopted community-based health insurance in the study area. On the other hand (43.63%) of the respondents are not adopters of the community-based health insurance. The resulting data from key informant interview supports this finding of progressive adoption of community-based health insurance in the study area.

Table 4. The adoption status of community-based health insurance

Variables	Freq.	Percent
CBHI Adoption		
No	154	43.63
Yes	199	56.37
Total	353	100

Source: Survey, 2021

Key informants confirmed that, poor awareness about the community-based health insurance, shortage of medical and pharmaceutical supplies within the health facility were hindering the adoption of community-based health insurance. There was also lack of follow up and monitoring the implementation process on the side of health insurance agency and city health bureau. Thus, these stakeholders were poorly monitoring and supporting CBHI customers at health facility.

Household Perception of Community Based Health Insurance

The descriptive statistics result, on the community-based health insurance perception of respondents in the study area, (table below) shows that the majority of respondents, which accounts (41.64%) and (35.69%) perceived community-based health insurance as a good and very good opportunity to improve their health condition. On the other hand, the descriptive statistics result show that, about (1.43%) and (21.53%) of the respondents perceived neutral and bad on community-based health insurance in the study area. This finding was also supported by key informants who believed that the community perception is improving through time to time.

Table 5. Respondents' perception distribution on community-based health insurance

Perception on CBHI	Frequency	Percent
Very good	126	35.69
Good	147	41.64
Neutral	4	1.43
Bad	76	21.53
Total	353	100

Source: Survey, 2021

However, the figure below shows the health service quality perception of respondents. Accordingly, most of the respondents contributing (58.64%) and (21.81%) have very poor and poor perception on the health service quality given by CBHI contracted health facilities respectively. While the rest (7.64%) and (11.9%) of the respondents have good and very good perception on the health service quality given by CBHI contracted health facilities in the study area. From this, it can be inferred that more than (80%) of the survey respondents acknowledged that the CBHI scheme's health service quality is poor and it may affect the adoption of community-based health insurance in the study area.
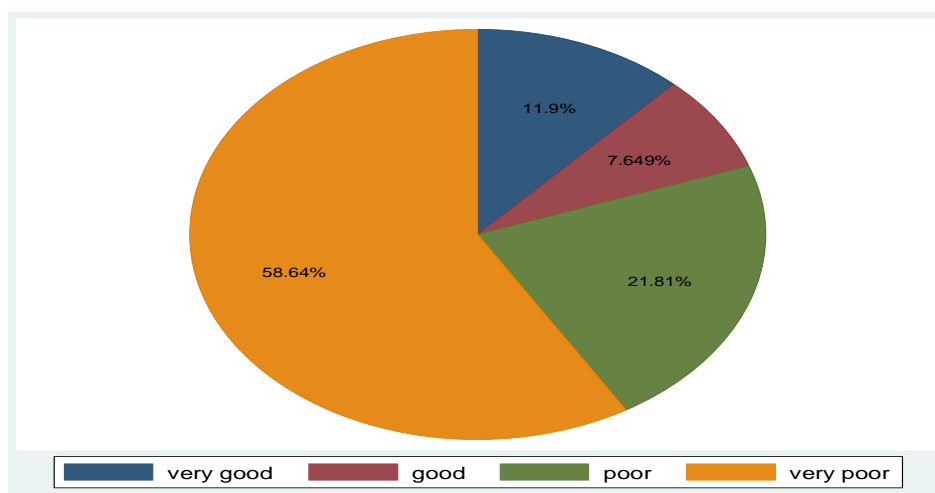

Figure 2. Health service quality category of participants computed from STATA

Binary Logistic Regression Analysis

In this study, logistic regression was performed to assess the impact of independent variables on the adoption of CBHI of households or to estimate factors determining the adoption of CBHI. The result of the binary logistic regression obtained from the STATA output is given in Table 6 which displays the coefficient, standard error, significance level and confidence interval. The estimated model coefficients cannot be interpreted directly but they explained much about the direction and significance of the predictor variables. Hence, in this study the determinants are identified by using the coefficients, while the magnitude of influence is expressed using the odds ratio.

The odds ratio was computed to be used in order to show the magnitude of determination of independent variables on the dependent variable, the adoption of community-based health insurance. The binary logistic regression result displayed the proportional odds ratio that is interpreted in terms of the change in odds. If the value exceeds one, then the odds of success (being adopter) increases, if the value is less than one, any increase in the predictor variables leads to a minimum in the odds of adoption. The odds ratio gives the relative amount by which the odds of the outcome increase (if odds ratio >1) or decrease (if odds ratio <1) when the value of predictor is increased by one unit.

As far as the variable education is concerned, the regression result shows that it affects the adoption of community-based health insurance in a positive direction. When the household's higher education increases, the likelihood of adopting community-based health insurance increases among respondents, which is significant at 95% confidence interval. The predicted result of the

binary logistic regression indicted that holding other factors constant, going from primary school to degree level of education increases the odds of adopting community-based health insurance by 6.64 times, compared to those who have primary school level of education. This might be explained by the fact that the higher education has found to increase the household probability to adopt community-based health insurance. Higher education is believed to provide respondents with greater capacity to learn and absorb new information about the CBHI. The result is in line with the findings of Jembere, (2018), Mark Dror *et al*. (2016), found that higher educational status has a positive influence on the adoption of community-based health insurance among households.

The estimated logistic regression result coefficient also indicates that monthly income determines the adoption of CBHI among households in a negative direction. When the household income increases, their likelihood of adopting community-based health insurance decreases among respondents which is significant at 95% confidence interval. The negative direction may be because of the household perception to get health service anywhere they want and like. The regression result revealed that assuming all other factors remains constant, a unit increase in monthly income of the respondents decreases the adoption of community-based health insurance by 0.99 times. This may be because of the respondent's capacity to pay that; they may need freedom to go anywhere and get medical treatment with better quality including medical treatments abroad. This result is in line with the finding of (Mukangendo *et al.*, 2018); Mark Dror *et al.*, 2016) which indicates income significantly affects the adoption of community-based health insurance.

Further, the estimated logistic regression result coefficient indicates that a legal framework significantly determines the adoption of community-based

health insurance among respondents in a negative direction. When households know about community-based health insurance legal frameworks, the likelihood of adopting CBHI increases among respondents which is significant at 99% confidence interval. The negative direction may be because of the household's knowledge of CBHI legal framework does not cover costs like chronic illness, dental treatment and other beauty medical treatment costs. Unfortunately, nowadays medical treatment for these services is increasing rapidly.

The regression results further revealed that taking all other variables remains constant, a unit increase in knowing CBHI legal framework among the respondents decreases the adoption of community-based health insurance by 0.0025 times. This may be because of the respondent's knowledge that, they become clear on what health costs are covered by the CBHI and which health is not covered by community-based health insurance. Thus, they may retreat to adopt community-based health insurance in the study area. This result is in line with the findings by (Mark Dror *et al.*, 2016) on which he argues that legal framework significantly affects the adoption of community-based health insurance.

Table 6. Coefficients of the binary logistic regression model and Odds ratio

Logistic regression			Number of obs		=	353
			Wald chi2(19)		=	110.86
			Prob > chi2		=	0.000
Log pseudo likelihood	=	-48.659885	Pseudo R2		=	0.7988

Robust

CBHI Adopter	Coef.	Odds Ratio	Std. Err.	z	P>z	95% Conf.
Age	-0.0231144	0.9771507	0.0289343	-0.8	0.424	-0.0798245
Sex	-0.9176553	0.3994545	0.681155	-1.35	0.178	-2.252695
Education						
Secondary	0.0088275	1.008867	1.174197	0.01	0.994	-2.292556
Diploma	0.7710316	2.161995	0.8953404	0.86	0.389	-0.9838033
Degree	1.893565	6.64301	0.9531738	1.99	0.047	0.0253789
Graduate and above	2.382908	10.83637	1.484491	1.61	0.108	-0.5266404
Income	-0.0008471	0.9991533	0.0003207	-2.64	0.008	-0.0014757
Family Size	0.0133975	1.013488	0.2143065	0.06	0.950	-0.4066354
Legal frame	-5.979108	0.0025311	1.355138	-4.41	0.000	-8.635129
Occupation						
Private business	0.8204271	2.27147	0.791258	1.04	0.300	-0.7304102
Others	-1.959821	0.1408836	0.5561779	-3.52	0.000	-3.04991
Waiting time	-0.0440418	0.9569139	0.0451858	-0.97	0.330	-0.1326044
Drug availability	2.913023	18.41238	0.9094667	3.2	0.001	1.130501
Distance	-0.0691102	0.9332238	0.0455971	-1.52	0.130	-0.1584789
Chronic illness	-2.514927	0.0808688	0.5376295	-4.68	0.000	-3.568661
Service quality						
Good	-1.274152	0.2796682	1.346446	-0.95	0.344	-3.913137
Poor	-1.443362	0.2361325	1.117834	-1.29	0.197	-3.634276
Very poor	1.896109	6.659928	0.7506441	2.53	0.012	0.4248733
Facility preference	-3.518673	0.0296387	0.9069648	-3.88	0.000	-5.296291
_cons	16.24588	1.140007	4.804076	3.38	0.001	6.830066

Source: Survey, 2021

In addition, the estimated regression coefficient indicated that, taking civil servant as a base category, occupational category of being in other occupations significantly determines the adoption of CBHI among households in a negative direction. When respondents are going from civil servant to other works, the likelihood of adopting CBHI decreases among respondents, which is significant at 99% confidence interval. The negative direction may be because of the sense of job losing and lack of confidence to pay for community-based health insurance. The result also indicated that assuming all other factors remains constant, household occupational engagement other than civil servant, decreases the odds of adopting community-based health insurance by 0.14 times compared to those who are civil servants. This may be because of frustration to get regular salary and inability to pay for community-based health insurance. This result is in line with the findings of Atinafu, Tilahun and Alemu (2017) they found that occupation has significant effect on the adoption of community-based health insurance.

On the other hand, the estimated logistic regression result coefficient shows that drug availability in the health facility significantly affects the adoption of CBHI among respondents in a positive direction. As the availability of essential drugs in the health facility increases the likelihood of adopting CBHI increases among respondents which is significant at 95% confidence interval. The positive direction may be because of the availability of drugs within the facility decreases their time and cash wastages. Further, the binary logistic regression result show that, all other variables remain constant, a unit increase in the availability of drugs within the health facility increases the adoption of community-based health insurance by 18.41 times among respondents. This may be because of drug availability avoid time and resource wastage for

respondents and easy access to medicines. This result is in line with the finding by Fufa *et al.* (2021) which indicates drug availability significantly affects the adoption of community-based health insurance.

Furthermore, the estimated binary logistic regression results coefficient indicates that, the availability of chronically ill family member significantly determines the adoption of CBHI among respondents in a negative direction. When the respondents have a family member with chronic illness, the likelihood of adopting CBHI decreases among respondents which is significant at 99% confidence interval. The negative direction may be because of the CBHI agreement is not covering the cost of chronically ill patients. The finding was also supported by the findings from key informant interview, that CBHI has limitations in covering the cost of chronic patients. Similarly, the regression result indicates that, other variables remain constant, a unit increase in the presence of chronically ill family member decreases the probability of adoption of community-based health insurance by 0.08 times among the respondents. This may be because of the community-based health insurance guideline limitation to include chronically ill patients in the CBHI system decreases the respondent's probability to adopt the insurance. This result is in line with the finding by Abdilwohab *et al.* (2021) and Mark Dror *et al.* (2016) arguing that the availability of chronically ill family member significantly affects the adoption of community-based health insurance.

Finally, the regression result coefficient showed that, the respondent's preference to get treatment in other health facilities significantly affects the adoption of community-based health insurance among respondents in a negative direction. As the respondents have interest to get treatment in other health facilities, the likelihood of adopting CBHI decreases among respondents which is significant at 99% confidence interval. The negative

direction may be because of the respondent's fear of restrictions to get health service from other health facilities. The estimated regression result indicates that, all other variables remain constant, a unit increase in the preference to get medical treatment in other health facilities decreases the probability of adoption of the community-based health insurance by 0.029 times among the respondents. This might be because of the respondent's preference to get medical treatment to anywhere they want and to escape restrictions in health service providing facility decreases the adoption of community-based health insurance. This finding is in line with the findings of Atinafu *et al*. (2017) they found that preference to get health treatment in other health facility significantly affects the adoption of community-based health insurance.

Conclusions and Recommendations

Conclusions

To give conclusions about factors determining the adoption of community-based health insurance, the researcher combined both descriptive and inferential analysis results together. In the descriptive part of the study, the results showed that (56.37%) of the respondents adopted community-based health insurance and also 35.69% and 41.64% of the respondents have very good and good perception towards community-based health insurance scheme respectively. From the binary logistic regressions, it can be concluded that higher education and drug availability have a significant and positive effect on the adoption of community-based health insurance. In other words, the increase in these variables increases the likelihood of adopting community-based health insurance. On the other hand, income, legal framework, occupation, chronically ill family member and other facility preference have a significant and negative effect on the dependent variable,

adoption of community-based health insurance. The increase in these independent variables underestimated the likelihood of adoption of community-based health insurance among household heads. Considering the results of odds ratio, the increase in these independent variables, decreases the likelihood of households to adopt community-based health insurance.

Recommendations

To improve the adoption status of community-based health insurance, integrated effort is needed among the governmental and nongovernmental organizations with full involvement of the households to enhance the adoption level of community-based health insurance and fully benefit the community from community-based health insurance service. Moreover, higher education should be strengthened and enhanced to cultivate its opportunity in raising the level of awareness about the benefits of community-based health insurance. Similarly, drug availability within the health facility should be strengthened that raise their likelihood of adoption of community-based health insurance. Therefore, the Ethiopian health insurance agency in collaboration with Ethiopian pharmaceutical supply agency could avail all the necessary drugs in health facilities to retain CBHI customers.

Extensive awareness creation system should be created and strengthened to break the perception of high-income households not to go to community-based health insurance. Likewise, the community-based health insurance guideline should be revised to include some chronic diseases medications to CBHI service list and cover the cost. In addition, community-based health insurance health facilities must be inclusive and competitive in-service quality and supplies to satisfy their customers and retain them. Finally, the

community-based health insurance service needs strong follow up and monitoring to solve facility level problems and sustain the service.

References

Abdilwohab MG., Abebo ZH., Godana W., Ajema D., Yihune M. and Hassen, H. (2021). Factors affecting enrolment status of households for community-based health insurance in a resource limited peripheral area in Southern Ethiopia. Mixed method.

Aderibigbe S., Adedeji, A., Doyin, Osagbemi, G., Kayode and A. Ayodele, A. (2017). Knowledge, Practice, and Willingness to Participate in Community Health Insurance Scheme among Households in Nigerian Capital City. Sudan Journal of Medical Sciences Volume 12, Issue no. 1, DOI 10.18502/sjms.v12i1.854.

Anagaw D., Sparrow R., Yilma Z., Alemu G. and Bedi A. (2014). Dropping out of Ethiopia's community-based health insurance scheme.

Atnafu D., Tilahun H. and Alemu YM. (2017). Community-based health insurance and healthcare service utilization, North West, Ethiopia: a comparative, cross sectional study.

Bifato B., Ayele B., Rike M. and Dangura D., (2020). Community Based Health Insurance Enrollment and Associated Factors in Sidama Region, Ethiopia. DOI: https://doi.org/10.21203/rs.3.rs-121840/v1

Demssie and Negeri (2020). Effect of Community-Based Health Insurance on Utilization of Outpatient Health Care Services in Southern Ethiopia: A Comparative Cross-Sectional Study.

Dror DM., Hossain SAS, Majumdar A., Pérez Koehlmoos TL., John D. and Panda PK. (2016). What Factors Affect Voluntary Uptake of Community - Based Health Insurance Schemes in Low-and Middle-Income Countries? A Systematic Review and Meta-Analysis. PLoSONE11 (8): e0160479.doi:10.1371/ journal. pone.0160479

Ethiopian Health Insurance Agency (2015). Evaluation of Community-Based Health Insurance Pilot Schemes in Ethiopia: Final Report. Addis Ababa, Ethiopia.

Fufa G., Ermeko T., Mohammed Y. and Lette, A. (2021). Assessing Factors Associated with Poor Community Based Health Insurance Client Satisfaction Level with Public Health Care Services in Negele Arsi Woreda Health Centers, Ethiopia. Health Sci J. 15 No. 5: 839.

Jembere M. (2018). Attitude of Rural Households towards Community Based Health Insurance in Northeast Ethiopia, the Case of Tehuledere District. Prim Health Care 8: 303. doi: 10.4172/2167-1079.1000303.

Mekuria and Girma (2010). Community-based Health Insurance Coverage, Drop-out Rates and Associated factors among households in selected districts of West Shewa Zone, Ethiopia.

Mukangendo M., Nzayirambaho M., Hitimana R. and Yamuragiye A., (2018). Factors Contributing to Low Adherence to Community-Based Health Insurance in Rural Nyanza District, Southern Rwanda. Journal of Environmental and Public Health Volume 2018, Article ID 2624591, 9 pages https://doi.org/10.1155/2018/2624591

Solomon F., Workie M., Hailu Z. and Tesfaye D. (2015). Ethiopia's Community Based Health Insurance: A step on the Road to Universal Health Coverage.

Tilahun H., Atnafu D., Asrade G., Minyihun A. and Alemu Y., (2018). Factors for healthcare utilization and effect of mutual health insurance on healthcare utilization in rural communities of South Achefer Woreda, North West, Ethiopia. Health Economics Review https://doi.org/10.1186/s13561-018-0200-z

Umeh and Feeleya (2017). Inequitable Access to Health Care by the Poor in CBHI Programs: A Review of Studies from Low and Middle-Income Countries.

USAID/INDIA (2008). Health Insurance Needs, awareness and assessment in the Bahraich District, Uttar Pradish.

Wagner K and Degnan D. (2009). Insurance systems in the Asia-Pacific region: Improving appropriate use of and access to medicines. Prescribing cultures and pharmaceutical policy in the Asia Pacific. The Walter H. Shorenstein Asia-Pacific Research Center at Stanford.

WHO (2010). World Health Report: Health Systems: Measuring Performance. Targeted health insurance in a low-income country and its impact on access and equity in access.