Determinants of Enrolment in Community Based Health Insurance program among households in East Wollega Zone, west Ethiopia: Unmatched Case-Control Study

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Abstract

Background: Ethiopia has launched a community-based health insurance (CBHI) since 2011, which is a principal and innovative financing mechanism to enhance domestic resource mobilization and sustainable health financing. However, CBHI implementation has just started in East Wollega zone with an estimated household of 345,851 households (HHs), and a very low enrolment rate of roughly 19% far from the regional and national target coverage of 80% set for districts.

Objective: To assess determinants of CBHI enrolment among HHs of East Wollega zone, Oromia, Ethiopia, 2022.

Method and materials: Community based unmatched 1:2 case-control study design was conducted between Jan 7and Feb 5/2022 among 428 HHs (144 cases and 284 controls). Cases were selected from HHs who registered for CBHI and currently using CBHI. Controls were from those who do not registered for CBHI membership. Data collected using a semi-structured, interview administered questionnaire. Data coded and entered into SPSS version 25 for analysis. All candidate variables were entered into multivariable analysis done in stepwise back ward LR to declare statistical significant association at P-value <0.05, 95%CI.

Result: Data from 428 (144 enrolled and 284 non-enrolled to CBHI) was collected yielding a response rate of 98.8%. Statistically lower odds of CBHI enrolment was observed among HHs who have poor knowledge [AOR=0.48 (95%CI:0.27,0.85)], perceived not respectful care [AOR=0.44 (95%CI :0.24,0.81)], unavailability of laboratory services [AOR=0.37(95%CI:0.21,0.66)], inappropriate time of premium payment [AOR=0.31(95%CI:0.18,0.52)]. In addition, medium wealth status category [AOR=0.11(95%CI: 0.03, 0.45)]. Higher odd of CBHI enrolment observed among who have formal education [AOR=2.39(95%CI: 1.28, 4.48)].

Conclusion and recommendation: Educational level, knowledge, time of membership payment, laboratory test availability, perception on respectful care and wealth status were significant determinants of CBHI enrolment status. Therefore, the responsible bodies should discuss and decide with community on the appropriate time of premium payment collection, enhance community education and knowledge on CBHI benefit package. Tracing the continuity of laboratory services, focus on respectful care provision of health care work force and convince the medium and above wealth status classes that the objective of CBHI is to have solidarity of helping each other.

1. Background

The out-of-pocket (OOP) spending is the most inequitable way of financing the healthcare that affects the poor worst, lack of risk pooling and insurance could be argued as the main reasons for health-related impoverishment in developing nations [1]. In the majority of Sub-Saharan countries, healthcare cost is mainly paid at the time of sickness and out-of-pocket (OOP) at the point of service delivery which potentially could inhibit access to universal health coverage (UHC) [2]. To achieve UHC, service and population coverage of health services has to be expanded along with financial protection for marginalized communities [3]. Therefore, community-based health insurance (CBHI) was evolved as an alternative health financing mechanism to OOPs in low- and middle-income countries (LMICs), particularly in areas where government or employer-based health insurance is minimal [1]. CBHI is a scheme that requires community members to prepay for health services and a pledge agreement requiring the health insurer to cover basic health service costs in exchange for premium payments into a collective fund which is designed, owned, and administered by members [4]. Community financing for health is a mechanism whereby households in a community finance or co-finance the current and/or capital costs associated with a given set of health services. At the same time they are expected to gain participation in the management of the community financing scheme and the organization of the health services [5].

Over 800 million people spend at least 10% of their household budget to pay for health care and 100 million people pushed to extreme poverty due to excessive or 'catastrophic' healthcare expenditure on their livelihood and suffer from financial shocks each year globally. The total economic cost of illness for households (HHs) estimated to be frequently above 10% of household income. This is potentially catastrophic: as such expenditure levels are "likely to force households to cut their consumption of other minimum needs, trigger productive asset sales or high levels of debt, and lead to impoverishment [6]. Over 90% of healthcare financial hardship and their outcome have been occurring in Sub-Saharan African countries, where resources are limited. In fact, however CBHI frequently unable to achieve its aim, mostly because of inadequate level of household enrolment [7].

No country in the world is able to full providing health cover to citizens effectively due to a lack of spending money for health care services. UHC monitoring report in 2017 showed that many people lack essential health service and people pushed into poverty spending too much budget. It showed that in the entire worlds, more than 7.3 billion people do not receive all the essential health service they needs [2].

In Africa, enrolment in the community based health insurance is low; having more than 90% of the targeted population uninsured except Rwanda with an enrolment of over 80% of the population, but their scheme no longer meets the definition of CBHI, as it has been compulsory[8].

Access to health care services in most of developing countries were affected since healthcare cost is mainly paid at the time of sickness and OOP at the point of service delivery [1]. UHC is becoming a priority, there is a need to increase the financial accessibility of health care services, protecting the population from catastrophic expenditure and decreasing the risk of extreme poverty. The way a country finances its health care system is a critical determinant for reaching UHC. This is so because it determines whether the health services that are available are affordable to those that need them [9].

In Ethiopia, CBHI was accepted as one of the strategy to attain UHC, since it recognized to ease resource mobilization to promote health service uptake and provide financial threat protection to insured members like that of most Sub-Saharan countries[10].

Ethiopian Ministry of Health has a vision for sustainable development goal, equitable, sustainable, adaptive and efficient health services. To provide equitable service, the financial issue should be considered; CBHI is one of the strategies set as a policy to solve this problem and one of governmental concern in health care financing systems [11].

The Ethiopian health care system is characterized by high OOP expenditure, increased health care needs, inability to mobilize more resources for health among rural dwellers, and inability to fully recover costs of care incurred by beneficiaries [12].

Thus, strong commitment is required to shift from an OOP model to CBHI to achieve UHC, and increase access to essential health care while spreading the financial consequence of sickness among the residents [13].

CBHI piloted 4 years ago in four regions in Ethiopia, accounting for 85% of the total population. Under the CBHI system, each district or Woreda will have a collective health fund to which participants will contribute. The poor are eligible for membership in community health funds sponsored by the woredas and regions. The infancy stage of CBHI studies in piloted areas revealed that the scheme benefited members by reducing the need to borrow money for medical care, improving outpatient care, seeking ever increasing enrolment, and a better willingness to pay than other East African countries. Rural households in most developing countries excluded from the formal insurance system. Thus, CBHI is being promoted for its potential to pool risks and resources so as to reduce HHs OOP expenditure and improve access to health care [14].

In Oromia, regional state the CBHI coverage is 43.5% in 2020/2021less than the national coverage, which was 50%. Indeed, the CBHI scheme's members are able to access health care benefits without financial hardship when they actually seek health care services although in Oromia still majority of vulnerable groups are not yet included in the scheme [15].

Though measures like awareness creation, community mobilization by health sectors have taken to increase the enrolment of HHs, the Zonal report shows that the CBHI coverage of East Wollega Zone is currently very low (18.69%). There was limited study that documented on factors determining CBHI enrolment in Oromia Regional State in general, East Wollega zone in particular. Hence, the aim of this study is to assess determinants of CBHI in East Wollega zone, Oromia Regional State, Ethiopia.

2. Methods And Materials

2.1. Study area and period

This study was conducted in East Wollega zone from Jan-07 to Feb 05/2022. It is one of the 21 zones of Oromia regional sate west of Ethiopia. The zone has 17 woredas', and has 340 Kebeles" with 338,599 HHs. The zone has currently 327 health posts, 65 public health centers, 5 public hospitals, and 1 regional laboratory facility, as reported by the zonal Health Office in the 2021-second quarter report.

2.2. Study Design

- Community based unmatched 1:2 case-control study conducted.

2.3. Population

All HHs reside in East Wollega zone during study period was a source population. Cases were HHs who registered for CBCI and currently using the program. Controls were HHs those who do not registered for CBHI membership. Study unit was all selected HHs who resides in the selected kebeles. HH heads older than 18 years who resides at least for 6 months were included in the study and HH heads that are unable to communicate during data collection were excluded from the study.

2.4. Sample size determination

The sample size was calculated by using Epi info version 7.2.2.6 Stat Calc. The known independent factors from the previous study considered to get maximum sample size for this study. Numerous factors considered to determine sample size for this study. Thus, sex of household head from study conducted in North Gondar gave maximum sample size required to conduct this study. Based on the following assumption; by 80% power at 95%CI, ratio of control to cases (r) = 2, Odds ratio = 2.79, P_2 = 17.2% [16].Considering design effect of 2 and possible non-response rate 10%; sample size of 433 (144 cases and 289 Controls) HHs was included in the study.

2.5. Sampling procedure

The study participants were drawn by using multistage sampling. In the first stage, seven districts were selected randomly from 14 districts launched to implement the CBHI before 2021. Then, 60 kebeles selected randomly from seven districts (143 kebeles). The final stage involved selection of HHs from sixty kebeles. List of cases and controls identified from each kebele administrations and utilized for sampling frame. Sample size proportionally allocated for

selected kebeles based on each kebeles HHs. Simple random sampling applied to select cases and controls by taking their lists as frame [Figure 1].

2.6. Data quality assurance

Data were collected using a semi-structured, interview administered questionnaire, which initially prepared in English and translated into Afaan Oromo, by those proficient in the language, and checked for consistency. Data collectors and supervisors trained intensively for 3 days, focusing for data collectors mainly on how to interview respondents and how to fill the questionnaires on a given instruction. Similarly, for supervisors, how to check reliability and validity of information daily collected. Besides, training which emphasized on the importance of respondents verbal consent and right, privacy and confidentiality.

Two nurses per Woreda assigned for data collection. Similarly, three primary health care unit (PHCU) directors were assigned for all woredas as supervisors.

All the data were checked for completeness, accuracy, and consistency by the principal investigator and the supervisors immediately after the data collection. In addition, the principal investigator and supervisors closely monitored the data collection. To check consistence of the questionnaire a pre-test conducted on 5% of the total sample size outside study area. The purpose of the pre-test was to ensure that the data collectors are familiar to the tools; the respondents are able to understand the questions, wording, and logic and skip order of the questions in a sensible way to the respondents. An amendment was done accordingly after the pre-test.

The validity of questionnaire was kept by using World Health Organization guideline for health insurance implementation, Ethiopian federal ministry of health standard tools for assessment of CRC (compassionate, respectful and caring) implementation, and adopted from published study done at Northern Ethiopia.

2.7. Description of variables

2.7.1. Outcome variable

- CBHI enrollment

2.7.2. Independent/explanatory variables

- **Socio demographic factors of CBHI**: Age, sex, educational status, marital status of HH head, occupation, and wealth index.
- **Health facility factors**: Time when membership payments made, availability of basic laboratory service, and availability of drug supplies in the health facility
- **Behavioral factors**: Awareness on the program, knowledge, and attitude towards CBHI management
- **Perceived compassionate and respectful care at public health facility**: Compassionate care, and respectful care.

2.8. Operational definition

Community Based Health Insurance

is a type of health insurance program that provides financial protection against the cost of illness and improving access to health care service for communities engaged in the informal sector [17].

Good knowledge

Based on evidence collected from the respondents, respondents/household heads who have correctly answered six value and above out of 10 knowledge questions classified as having good knowledge on CBHI [18].

Poor knowledge

Based on evidence collected from the respondents, respondents/household heads who have correctly answered less than six values out of 10 knowledge questions classified as having poor knowledge on CBHI [18].

Attitude: Assessed by Likert's scale. The questions on the Likert's scale had positive and negative responses that ranged from strongly agree, agree, neither agree nor disagree, disagree and strongly disagree. The scoring system was used with respects to respondents' responses as follows: strongly agree 5,agree 4,neither agree nor disagree 3,disagree 2,strongly disagree 1. The responses summed up and a total score obtained for each respondent. The median score was calculated and those scored above the median and median score categorized as positive attitude and scores below the median meant negative attitude towards CBHI [19, 20].

Compassionate care

If the respondents score median and above of compassionate assessment items/questions [21].

Not Compassionate care

If the respondents score below the median of compassionate assessment items/questions [21].

Respectful care

If the respondents score median and above of respectful assessment items/questions [21].

Not respectful care

If the respondents score below the median of respectful assessment items/questions.

Time of membership

is the time when premium payment for CBHI membership collected from the HH heads.

2.9. Data processing and analysis

For completeness and consistency at the end of data collection period, the principal investigators checked questionnaires completed by respondents. Then coded and entered to SPSS for analysis. Before running statistical analysis, the categorical variables recoded and categorized to fit for analysis using SPSS. Odds ratio at 95% CI used to describe the association between the independent and outcome variables. Descriptive statistics presented using narration and table in the form of frequency and percentage to describe the relevant variables correlated study population. Bivariate logistic regression analysis performed to find a crude association of explanatory variables with the outcome variable at p-value ≤ 0.25 and crude odds ratio (COR) with 95% CI. Those explanatory variables demonstrate association by bivariate logistic regression models considered candidate for multivariable model. The multivariate logistic regression models will be calculated at 95% confidence level (AOR with 95% CI) and alpha (α) = 5% cut off point (at p-value less 0.05). Those variables found significant at p-value 0.05 level & Adjusted Odds ratio (AOR) with 95% CI considered as independent determinant factors associated with community based health insurance enrollment status. Principal component analysis was done to analysis to classify wealth status of participants.

2.10. Ethical considerations

Before conducting any research work, Ethical clearance was obtained from Institutional Review Board of Nekemte health Science College. Besides, the letter of approval was taken from East Wollega Zonal health department, and it was taken to district health office for final approval. Informed verbal consent was taken from each study participant after briefed on their right and autonomy, study objective and what needed from them. All methods of this research work were carried out in accordance with relevant guidelines and regulations.

3. Results

Among 433 of the study participants, a total of 428 (case 144 and 284 controls) of HHs in east Wollega zone were involved in study at response rate of 98.8%.

3.1. Socio demographic characteristics

Demographic status shows that the mean age (standard deviation) for cases and control were 39.5(SD: ±10.5) and 38.4 (SD: ±12. 6) years, respectively. Concerning sex of respondents, 108(75%) of cases and 193(68%) of controls were male headed HHs. The marital status of respondents found as about half, 125(86.8%) of cases and majority 246 (86.6%) of controls were in marriage. Regarding to ethnicity, 137 (95.1%) cases and 277 (97%) of controls were Oromo. Seven (4.9%) of cases and two (0.7%) of controls belongs Amhara.

Regarding to job status, 93(64.6%) cases and 189 (66.5%) of controls were farmers. According to literacy status 66 (45.8%) of cases and 76 (26.8%) of controls attended primary education. According to number member 80(55.4%) of cases and 151(53.2%) of controls have greater than five family members [Table 1].

Table 1
Sociodemographic characteristics of study participants in east Wollega zone, 2022.

Variables	Category	Cases (n = 144)	Control(n = 284)	COR 95%CI	P-value
Age	≤ 24	6 (4.2%)	31(10.9%)	1	
	25–54	123 (85.4%)	215(75.7%)	2.956 (1.20 ,7.28)	0.019
	55–64	11 (7.6%)	26(9.2%)	2.19 (0.71, 6.72)	0.172
	65 and above	4 (2.8%)	12(4.2%)	1.72 (0.41, 7.19)	0.456
Sex	Male	108 (75%)	193(68%)	1	
	Female	36 (25%)	91(32%)	0.71 (0.45, 1.11)	0.133
Marital status	Married	125 (86.6%)	246(86.6%)	1	
	Widow	9 (6.3%)	14(4.9%)	1.27 (0.53, 3.00)	0.594
	Divorce	3(2.1%)	8(2.8%)	0.74 (0.19, 2.83)	0.658
	Single	7(4.9%)	16(5.6%)	0.86 (0.35, 3.15)	0.748
Family Size	≥ 5	80 (55.4%)	151(53.2%)	1	
	< 5	64 (54.6%)	133(46.8%)	0.5 (0.33, 2.76)	0.341
Educational level	Secondary and above	33(22.9%)	78(27.5%)	1	
	Primary school	66(45.8%)	76(26.8%)	2.1 (1.22, 3.47)	0.007
	Able to read and write	13(9.1%)	22(7.7%)	1.4 (0.63, 3.10)	0.411
	Unable to read/write	32(22.2%)	108(38%)	0.7 (0.34, 1.23)	0.218
Occupation	Farmer	93(64.6%)	189(66.9%)	1	
	Daily labor	22(15.3%)	48(16.5%)	0.9 (0.53,1.64)	0.854
	Merchant	8(5.6%)	7(2.5%)	2.3 (0.82, 6.6)	0.114
	Gov. Employee	14(9.7%)	34(12%)	0.8 (0.43, 1.64)	0.602
	NGO Employee	7(4.9%)	6(2.1%)	0.68(0.13 ,3.42)	0.637
Wealth status	Poorest	32 (22.2%)	70(24.6%)	1	
	Poor	37 (25.7%)	38(13.4%)	2.1 (1.15, 3.95)	0.016
	Medium	3 (2.1%)	46(16.2%)	0.1 (0.04, 0.49)	0.002
	Rich	72 (50%)	130(45.8%)	1.2 (0.73, 2.01)	0.459
Chronic disease	Yes	83(57.6%)	153(53.9%)	1	
	No	61(42.4%)	131(46.1%)	0.585 (0.573,1.28)	0.459
Ethnicity	Oromo	137(95.1%)	277(97.5%)		
	Amhara	7(4.9%)	2(0.7%)		
	Gurage		2(0.7%)		

Variables	Category	Cases (n = 144)	Control(n = 284)	COR 95%CI	P-value
	Others		3(1.1%)		
Religion	Orthodox	37 (25.7%)	97(34.2%)		
	Protestant	104 (72.2%)	170(59.9%)		
	Muslim	3(2.1%)	11(3.9%)		
	Others		6(2.1%)		

3.2. Wealth status of respondents by principal component analysis (PCA)

According to wealth status of respondents 72 (50%) of enrolled and 130(45.8%) of non-enrolled were found in fourth quintile (rich)[Figure 2].

3.3. Health facility factors

Ninety-four (65.3%) and 198 (69.7%) of the cases and controls respectively perceive that they wait for long time to get service from public health facility. Ninety-four (65.3%) of the enrolled and seventy-four (26.1%) non-enrolled HHs respectively reported as the time of member ship is appropriate [Table 2].

Table 2
Factors related to health facility in East Wollega zone, 2022.

Variable	Category	Case (n = 144)	Control (n = 284)	COR 95%CI	P-value
Distance from the health facility	≤ 10Km	111 (77.1%)	223 (78.5%)	1	0.734
	> 10Km	33 (22.9%)	61 (21.5%)	0.920(0.569,1.488)	
Waiting for long time to get a service after reaching the health facility	Yes	94 (65.3%)	198 (69.7%)	1	0.352
	No	50 (34.7%)	86 (30.3%)	1.225(0.800,1.875)	
Time of member ship registration is appropriate (when you get money)	Yes	94 (65.3%)	74 (26.1%)	1	0.000
	No	50 (34.7%)	210 (73.9%)	0.187(0.122,0.289)	
Getting the drug prescribed from the public health facility	Yes	76 (52.8%)	90 (31.7%)	1	0.000
	No	68 (47.2%)	194 (68.3%)	0.415(0.275,0.627)	
Getting the laboratory service requested by the health professionals from public health facility	Yes	109(75.7%)	111 (39.1%)	1	0.000
	No	35(24.7%)	173 (60.9%)	0.206(0.131,0.313)	

3.4. Knowledge assessing characteristics of respondents

Knowledge of respondents on CBHI assessed based on the following variables. The response of participant summed up to categorize the participant as having good knowledge or poor knowledge on community based health insurance [Table 3].

Table 3
Knowledge assessing items

Variables	category	Enrolled	Non-enrolled
Are you aware of the benefits of CBHI	Yes	134 (93.1%)	227 (79.9%)
	No	10 (6.9%)	57 (20.1%)
The community-based health insurance scheme will pay for your medical expenses when you get sick	Yes	115 (79.9%)	160 (56.3%)
	No	29 (20.1%)	124 (43.7%)
The CBHI scheme will cover the health care services gained by the formally employed and not employed households once joined to the CBHI scheme	Yes	20 (13.9%)	28 (9.9%)
	No	124 (86.1%)	256 (90.1%)
Both the rich and the poor will receive proper healthcare of the same quality when becoming a member of the CBHI scheme	Yes	91 (63.2%)	122 (43%)
	No	53 (36.8%)	162 (57%)
The quality of healthcare services will be almost the same throughout the whole country once the country implemented the community based-health insurance	Yes	88 (61.1%)	149 (52.5%)
	No	56 (61.1%)	135 (47.5%)
You will receive services from the referred contracted higher health facilities with no out of pocket money when your health needs a specialized health care setup.	Yes	106 (73.6%)	189 (66.5%)
	No	38 (26.4%)	95 (33.5%)
The community-based health insurance covers the cost of pharmaceutical care and diagnostic tests for referred cases	Yes	33 (23.1%)	28 (9.1%)
	No	110 (76.9%)	256 (90.9%)
The community-based health insurance scheme excludes treatment abroad, kidney dialysis/treatments, artificial teeth, and plastic surgery.	Yes	76 (52.8%)	152 (53.5%)
	No	68 (47.2%)	132 (46.5%)
The community-based health insurance scheme pays for the services received from only governmental health institutions	Yes	114 (79.2%)	199 (70.1%)
	No	30 (20.8%)	85 (29.9%)
CBHI allows people to have equal/fair access by skilled health professionals.	Yes	121 (84%)	202 (71.1%)
	No	23 (16%)	82 (28.9%)

When data computed for assessing knowledge 71.5% of those enrolled to CBHI and 53.9% of non-enrolled have good knowledge on CBHI whereas 28.5% of enrolled, and 46.1% of non-enrolled have poor knowledge on CBHI [Table 7].

3.5. Attitude assessing characteristics of respondents

Likert scale of measurement applied to measure the attitude of respondents towards CBHI. Thus, nine item statements regarding CBHI were prepared to measure the attitude of respondents. Strong agreement to express favorable at one extreme of scale and strong disagreement to show unfavorable attitude towards CBHI considered. The score of each respondent was obtained by summing of each item. Accordingly, numerical score indicating least favorable attitude given one (1) and the most favorable attitude had given five (5) to yield total score that indicate attitude towards scheme. The scoring system was used with respects to respondents' responses as follows: strongly agree 5, agree 4, neither agree nor disagree had given 3, disagree 2, and strongly disagree 1. The median score was calculated and those scored above the median and median score categorized as positive attitude and scores below the median meant negative attitude towards CBHI [Table 4].

Table 4
Attitude assessing items

Variables	Category	Enrolled N (%)	Non-enrolled N (%)
CBHI benefit packages are adequate to meet health care needs of insured household.	1. Strongly disagree	3 (2.1%)	2(0.7%)
	2. Disagree	10 (6.9%)	50(17.6%)
	3. Neither agree nor disagree	4(2.7%)	3(1.1%)
	4. Agree	70 (48.7%)	142(50%)
	5. Strongly Agree	57 (39.6%)	87(30.6%)
CBHI management is trust worthy.	1. Strongly disagree	2(1.3%)	6(2.1%)
	2. Disagree	9(6.4%)	50(17.6%)
	3. Neither agree nor disagree	2(1.3%)	2(0.7%)
	4. Agree	74(51.5%)	148(52.1%)
	5. Strongly Agree	57(39.6%)	78(27.5%)
The quality of health care services is good (waiting time, availability of drugs, diagnostics)	1. Strongly disagree	3(2.1%)	8(2.8%)
	2. Disagree	13(9%)	53(18.7%)
	3. Neither agree nor disagree	9(6.4%)	8(2.8%)
	4. Agree	66 (45.7%)	105(37%)
	5. Strongly Agree	53(36.8%)	110(39.7%)
CBHI has the potential of on promoting healthcare seeking behavior from modern health care institutions	1. Strongly disagree	1(0.7%)	0
	2. Disagree	14 (9.7%)	46(16.2%)
	3. Neither agree nor disagree	2(1.4%)	4(1.4%)
	4. Agree	63 (43.8%)	133(46.8%)
	5. Strongly Agree	64 (44.4%)	101(35.6%)
CBHI protects from unaffordable healthcare expenditures	1. Strongly disagree	1(0.7%)	0
	2. Disagree	9(6.3%)	31(10.9%)

Variables	Category	Enrolled N (%)	Non-enrolled N (%)
	3. Neither agree nor disagree	5(3.5%)	4(1.4%)
	4. Agree	51(35.4%)	134(47.2%)
	5. Strongly Agree	78 (54.1%)	115(40.5%)
Premium payment for CBHI scheme is Inexpensive	1. Strongly disagree	2(1.4%)	4(1.4%)
	2. Disagree	9(6.3%)	65(22.9%)
	3. Neither agree nor disagree	3(2.1%)	5(1.8%)
	4. Agree	66(45.8%)	124(43.6%)
	5. Strongly Agree	64(44.4%)	86(30.3%)
CBHI is not only to promote health condition of the poor	1. Strongly disagree	5(3.5%)	18(6.3%)
	2. Disagree	12(8.3%)	48(16.9%)
	3. Neither agree nor disagree	3(2.1%)	4(1.4%)
	4. Agree	71(49.3%)	130(45.8%)
	5. Strongly Agree	53(36.8%)	84(29.6%)
CBHI is not a means of collecting revenue (profit) to the government	1. Strongly disagree	2(1.4%)	4(1.4%)
	2. Disagree	7(4.9%)	20(7%)
	3. Neither agree nor disagree	5(3.5%)	4(1.4%)
	4. Agree	68(47.2%)	145(51.1%)
	5. Strongly Agree	62(43.1%)	111(39.1%)
CBHI is trusted to establish equity of service for all households	1. Strongly disagree	3(2.1%)	5(1.8%)
	2. Disagree	24(16.7%)	70(24.6%)
	3. Neither agree nor disagree	4(2.7%)	3(1.1%)
	4. Agree	70(48.7%)	135(47.5%)
	5. Strongly Agree	43(29.8%)	71(25%)

Finally the computed data reveals 126 (87.5%) of enrolled and 192(67.6%) of non-enrolled have positive (Favorable) attitude towards CBHI. But, 18 (12.5%) of enrolled and 18(12.5) have negative attitude on CBHI. Majority of the non-enrolled household heads have positive attitude and 92(32.4) of them have negative attitude towards CBHI [Table 7].

3.6. Community's perception towards compassion care

Standard checklist from national CRC training guideline designed to assess how compassion health worker is used. Eight statements were taken to assess how communities feel about health workforce. Respondents score median and above classified as perceived compassionate and score below the median of compassionate assessment items classified as perceive not compassionate [Table 5].

Table 5
Service provider's Compassion assessment items

Service provider's Compassion assessment items	Category	Enrolled	Not enrolled
		N (%)	N (%)
At public health facility, the health care provider properly introduces himself/herself and status.	Yes	111 (77.1)	180 (63.4)
	No	33 (22.9)	104 (36.6)
At public health facility, the health care provider called client by name.	Yes	123 (85.4)	214 (75.3)
	No	21 (14.6)	70 (24.7)
At public health facility, the health care provider actively listen what the client says.	Yes	140 (97.2)	262 (92.3)
	No	4 (2.8)	22 (7.7)
At public health facility, the health care provider shows love and tolerance.	Yes	134 (93.1)	246 (86.6)
	No	10 (6.9)	38 (13.4)
At public health facility, the health care provider tries to understand the clients' need.	Yes	136 (94.4)	266 (93.7)
	No	8 (5.6)	18 (6.3)
At public health facility, the health care provider actively understands the patient' emotions?	Yes	137 (95.1)	242 (85.2)
	No	7 (4.9)	42 (14.8)
At public health facility, the health care provider show relational communication.	Yes	135 (93.8)	276 (97.2)
	No	9 (6.3)	8 (2.8)
At public health facility, the health care provider use supportive words.	Yes	138 (95.8)	241 (84.9)
	No	6 (4.2)	43 (15.1)

According to the data collected on perception, 92(63.9%) of enrolled and 127(44.7%) non-enrolled to CBHI perceive health work force is compassionate. Whereas 52(36.1%) of enrolled and 157(55.3%) of non- enrolled to CBHI perceived health care workforces not compassionate respectively [Table 7].

3.7. Items to assess respect of health work force to community

Standard checklist from national CRC training guideline designed to assess how Health worker respect the client used. Ten statements had taken to assess how the communities feel about health workforce. If the respondents score median and above of respectful assessment items/questions categorized as perceived respectful. Not respectful care: If the respondents score below the median of respectful assessment items/questions [Table 6].

Table 6
Service provider's Respect assessment items

Service provider's respect assessment items	Category	Enrolled N (%)	Not enrolled N (%)
The service provider greets the client respectfully	Yes	122 (84.7)	170 (59.9)
	No	22 (15.3)	114 (40.1)
The service provider obtains consent before examination and procedures	Yes	125 (86.8)	191 (67.3)
	No	18 (13.2)	93 (32.7)
The service provider ensures confidentiality of patient	Yes	139 (96.5)	274 (96.5)
	No	5 (3.5)	10 (3.5)
The service provider maintains privacy in providing clinical care	Yes	130 (90.3)	231 (81.3)
	No	14 (9.7)	53 (18.7)
The service provider do not verbally abuse patients	Yes	32 (22.2)	40 (14.1)
	No	112 (77.8)	244 (85.9)
The service provider treat patients equally without discrimination	Yes	106 (73.6)	188 (66.2)
	No	38 (26.4)	96 (33.8)
The service provider responds promptly and professionally when patients ask for help	Yes	112 (77.8)	176 (62)
	No	32 (22.2)	108 (38)
The service providers physically do not abuse clients	Yes	116 (80.6)	164 (93)
	No	28 (19.4)	20 (7)
The guards receive patient and families with respect	Yes	126 (87.5)	235 (82.7)
	No	18 (12.5)	49 (17.3)
The record officers treat patient and families with respect	Yes	119 (82.6)	194 (68.3)
	No	25 (17.4)	90 (31.7)

The study indicates110 (76.4%) of the enrolled house holds 146(51.4%) non-enrolled to CBHI perceived work force as respectful. Whereas 34(23.6%) of enrolled and 138(48.6%) non-enrolled perceived health care work forces do not show respect[Table 7].

3.8. Knowledge, Attitude, and perception on CRC and quality of health service

On bi-variable analysis; perception on compassion and respect, knowledge and attitude of study participants are selected for multivariable analysis at p-value < 0.25 and 95%CI [Table 7].

Table 7
Perception of care and Behavioral factors participants in East Wollega zone, 2022

Variable	Category	Case(n = 144)	Control(n = 284)	COR 95%CI	P-value
Perceived compassionate care	Compassionate	92(63.9%)	127(44.7%)	1	0.000
	Not compassionate	52(36.1%)	157(55.3%)	0.46(0.30,0.69)	
Perceived respectful care	Respectful	110 (76.4%)	146(51.4%)	1	0.000
	Not respectful	34(23.6%)	138(48.6%)	0.33(0.21,0.51)	
Knowledge on CBHI	Good	103(71.5%)	153(53.9%)	1	0.000
	Poor	41(28.5%)	131(46.1%)	0.47(0.30,0.72)	
Attitude towards CBHI	Positive	126(87.5%)	192(67.6%)	1	0.000
	Negative	18(12.5%)	92(32.4%)	0.30(0.17,0.52)	

3.9. Determinants of Community Based Health Insurance

3.9.1. Bi-variable analysis

After bi-variable analysis in Binary logistic regression; some variables were selected by being potential candidate for multivariate analysis at 95%CI and p-value < 0.25. High CBHI enrollment status observed in those who asked to enroll in appropriate time for member ship registration when they got money than those asked at any time [Table 2]. Educational level and wealth status of the respondents also show association with CBHI enrollment [Table 1]. Among service delivery, related factors availability of drug prescribed and laboratory service analyzed for being potential candidate for multivariate analysis [Table 2]. From CRC assessment factors CBHI enrollment status was higher among those who perceive that health care provider were compassionate than not. In addition, those who perceive that health worker shows respect ion to client enrolled in CBHI program than that do not perceive respect ion of health workers [Table 3].

Other factors such as knowledge and attitude of respondents were analyzed for being candidate for CBHI enrollment at 95%CI and p-value < 0.25. In which CBHI enrollment was higher in those who have good knowledge about CBHI than who have poor knowledge. Similarly, those who have good attitude toward CBHI enrolled more when compared with those who have negative attitude about CBHI [Table 3].

3.9.2. Multivariable analysis

After all variables in the study entered to binary logistic regression to identify candidate variable; for multivariate analysis, some variables were selected being potential candidates by p-value < 0.25. These variables are; Wealth status, Level of education, membership registration time, Drug availability, Laboratory service availability, perception of community toward compassion of health care, respect of health service provider, Knowledge on CBHI and attitude of community toward CBHI program.

To control possible confounders all candidate variables were included in multivariate analysis in logistic regression using backward likelihood ratio model (LR); membership registration time, wealth status, level of education, Laboratory service availability, perception of community on respect of health service provider and attitude of community toward CBHI program had statistically significant association with CBHI enrollment (p- value < 0.05). P-value and confidence interval was test used to declare significance association and multicollinearity checked for variance inflation factor [Table 8].

Table 8
Multivariable analysis of independent factors of CBHI enrollment at East Wollega Zone, Oromia Region, West Ethiopia, 2022.

Variable	Category	Enrollment status		COR	AOR	P-value
		Enrolled	**Non enrolled**	(95%CI)	(95%CI)	
Appropriate time to enroll	yes	94 (65.3%)	74 (26.1%)	1	1	
	No	50 (34.7%)	210 (73.9%)	0.187(0.122,0.28)	.31(.18,.52)	.000**
continuous Drug availability	Yes	76 (52.8%)	90 (31.7%)	1	1	
	No	68 (47.2%)	194 (68.3%)	0.415(0.275,0.627)	1.14(.66,1.99)	.631
Continuous Lab. tests availability	Yes	109(75.7%)	111 (39.1%)	1	1	
	No	35(24.7%)	173 (60.9%)	0.206(0.131,0.313)	.37(.21,.66)	.001**
Perception on compassionate	compassionate	92(63.9%)	127(44.7%)	1	1	
	not compassionate	52(36.1%)	157(55.3%)	0.46(0.30,0.69)	1.09(.58,2.06)	.788
Perception on Respect	respectful	110 (76.4%)	146(51.4%)	1	1	
	not respectful	34(23.6%)	138(48.6%)	0.33(0.21,0.5)	.44(.24,.81)	.009**
Knowledge on CBHI	Good	103(71.5%)	153(53.9%)	1	1	
	Poor	41(28.5%)	131(46.1%)	0.47(0.30,0.72)	.48(.27,.85)	.011**
Attitude towards CBHI	Positive	126(87.5%)	192(67.6%)	1	1	
	Negative	18(12.5%)	92(32.4%)	0.30(0.17,0.52)	.1.43(.69,2.97)	.336
Educational level	Secondary school and above	33(22.9%)	78(27.5%)	1	1	
	Primary school	66(45.8%)	76(26.8%)	2.1(1.22, 3.47)	2.39(1.28,4.48)	.006**
	Able to read and write	13(9.1%)	22(7.7%)	1.4(0.63, 3.10)	1.40(.52,3.75)	.502
	Can't read or write	32(22.2%)	108(38%)	0.7(0.34, 1.23)	1.18(.58,2.43)	.648
Wealth index	Poorest	32 (22.2%)	70(24.6%)	1	1	.015
	Poor	37 (25.7%)	38(13.4%)	2.1 (1.15, 3.95)	.97(.45,2.10)	.944
	Medium	3 (2.1%)	46(16.2%)	0.1 (0.04, 0.49)	.11(.03,.45)	.002**
	Rich	72 (50%)	130(45.8%)	1.2 (0.73, 2.01)	.74(.36,1.53)	.418

Note: **CI = confidence interval, ** significant**

4. Discussion

This study revealed that, Educational status of HH heads, Wealth index, Knowledge, HH heads perception of Respectful care, Time of membership premium payment and Unavailability of continuous laboratory service were independent determinant factors for CBHI enrollment in East Wollega Zone.

This study revealed that, having primary education show a positive association with CBHI enrollment. This finding is consistent with the study conducted in Southern Ethiopia[23], Northwest Ethiopia[24], Oromia Regional state[11], and Ghana[32].The odds of attending primary education is 2 times more likely in enrolled than non-enrolled. This could be because those who are educated can understand the CBHI scheme principle and benefit.

In this study, knowledge of HH heads is significantly associated with CBHI enrollment. Having poor knowledge on CBHI reduces the probability of enrollment by 52%. This agrees with the studies conducted in North East [21] and North West Ethiopia [24].This might be for the reason that those individuals with good knowledge could ask details of the package benefit & convinced, and decide enrolled.

Perception of HH heads on respectful care found to be factors significantly associated with enrollment to CBHI scheme. The community members perceive health work force as no respectful care by health work force enroll by 56% less likely than those who perceive as respectful. Similarly, a study conducted in Ghana shows that Perceptions related to providers was among the factors that affect enrollment to health insurance [16]. This could be because the more the community perceives, as health care providers are respectful, the more likely they enroll in CBHI scheme to utilize public health care services.

The study pointed out that CBHI premium collection time was significant determinant factor of enrollment into CBHI schemes. Household heads who perceived collection time as appropriate were 69% more likely to be enrolled into CBHI compared to those responded as not appropriate. This could be because of the truth that even though they have convinced and have willingness to be enrolled. However, the time and mode of premium collection is not during when the community gets the money. Known that they fill inconvenient, and they could not be the member. This finding is similar with studies conducted in developing countries [7] and southern Ethiopia [23].

Conferring to this study, level of wealth index of household heads category medium was a significant predictor for CBHI enrollment. It agrees/consistent with studies conducted in North West Ethiopia [22], South Ethiopia [23], Kenya [24] and Ghana's Upper West Region [32]. This is explains that those who have wealth index (income) medium category might have the potential to pay from out of pocket payment for their health care cost and less likely to be enroll to CBHI scheme. One the other hand, the poorest have the worry of covering the health care cost it incurs from their own out of pocket payment when their family member get sick and, they could be more likely to enroll in CBHI scheme. Those who are unable to pay for the CBHI service showed that the insurer could subsidize in part at least for basic health services for the poor part of the households.

According to this study, unavailability of continuous laboratory tests in health facility was significantly associated with community based health insurance enrollment status. Availability laboratory increases CBHI enrollment by 63% more likely. This is similar to the study conducted in South Ethiopia [23] and North West Ethiopia [33]. This linked to; household heads who perceived lack of continuous laboratory tests were hinder from enrollment in to Community based health insurance scheme. This is due to the decline in confidence in getting quality health care from the scheme benefit package in the lack of continuous laboratory tests.

4.1. Limitation of the study

- This research is not free of limitations:-recall bias since some of the data were collected through interviewing the respondents.

5. Conclusion

The study pinpointed determinant factors of CBHI enrollment. Educational level, Knowledge, Time of membership payment, Laboratory test availability, Perception on Respectful care and Wealth status were significant determinants of CBHI enrollment status.

6. Recommendation

Oromia Regional Health Bureau should

- Amend time of membership premium payment, by involving the community to decide the appropriate time for premium payment (membership time).
- Conduct further study on premium renewal status of the community.
- Conduct further study on the respectful care status of the health care work force to gain further evidence and appreciate the perception of the community on respectful care characteristics.
- Farther work to increase the knowledge of the community on CBHI benefit package in a tailored way using different channels of communication.
- Supervise and monitor laboratory services in the health facilities since unavailability of continuous laboratory tests was among the determinant factors for CBHI enrollment.
- Pay special attention for those with low educational status to enhance their participation in CBHI enrollment

East Wollega Zonal Health Office should

- Supervise and monitor laboratory services supply in the health facilities and fill the gaps continuously.
- Decide on premium collection time as conducive to the specific woredas.
- Assess the respectful care provision of health workforces periodically.
- Facilitate means to enhance knowledge of the community on CBHI benefit package

Woreda Health offices should

- Involve the community to decide the convenient premium payment collection time based on their specific tangible income variability.
- Improve the level of knowledge of the community on CBHI benefit package, through periodic and planned community conversation.
- Assess the health work force respectful care provision whether or not it attracts the community towards CBHI enrollment.
- Prepare and provide information on CBHI enrollment particularly focusing on uneducated household heads based on their level of understanding.
- Work with other stakeholders (agricultural, education, Business sectors and others) collaboratively to increase wealth of the community.
- Assess and avail the basic laboratory services continuously, and request to fill the potential gaps timely

Health facility should

- Conduct community conversation to fix appropriate time for premium payment collection.
- Provide tailored education for the community on CBHI benefit package.
- Validate the respectful care provision of health care work force and act on it accordingly.

Abbreviations

- CBHI: Community based health insurance.
- CRC: Compassionate and respectful care
- HHs: Households
- OOP: Out-of-pocket
- PCA: Principal component analysis
- UHC: Universal health coverage

Declarations

Ethics approval and consent to participate

Initially, ethical clearance obtained from the Institutional Review Board of Nekemte health science college, and then letter of approval was taken from East Wollega Zonal health department. This approved letter taken to the district health office for final approval. After approval, it handed to the data collectors and used throughout their visit to all selected sites for data collection. Each study participants briefed on their right and autonomy, study objective and what needed from them. To whom show permission verbal consent granted and included in participants of the study.

Consent for publication

'Not applicable.'

Availability of data and materials

The finding of this study was generated from the data collected and analyzed based on stated methods and materials. The original data supporting this finding are available from the corresponding author on reasonable request.

Competing interests

"The authors declare that they have no competing interests."

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Authors' contributions

MD, TL, BT, and TO were participated in the design of the study, performed the data collection and the statistical analysis. **TT** and **ZK** supervised the study, ensured quality of the data, assisted in the analysis and interpretation of the data. All authors read and approved the manuscript.

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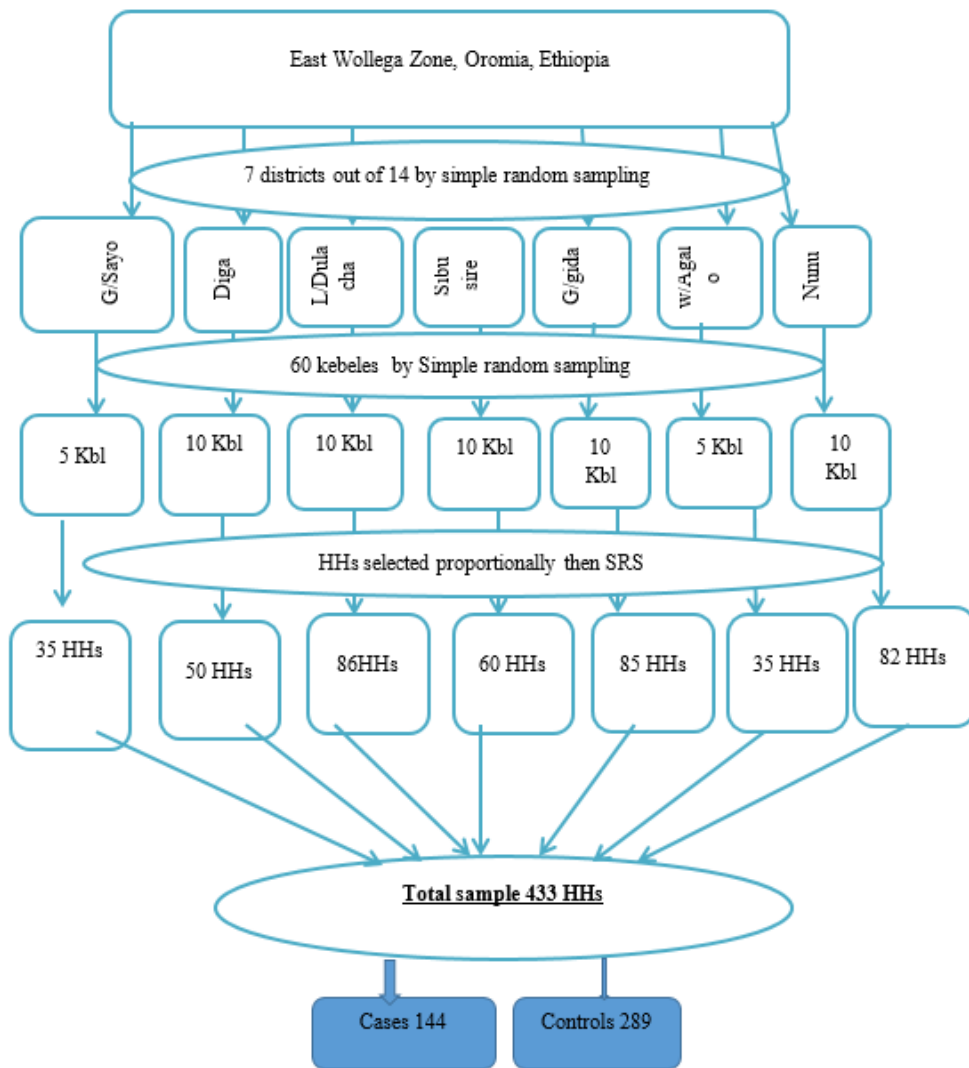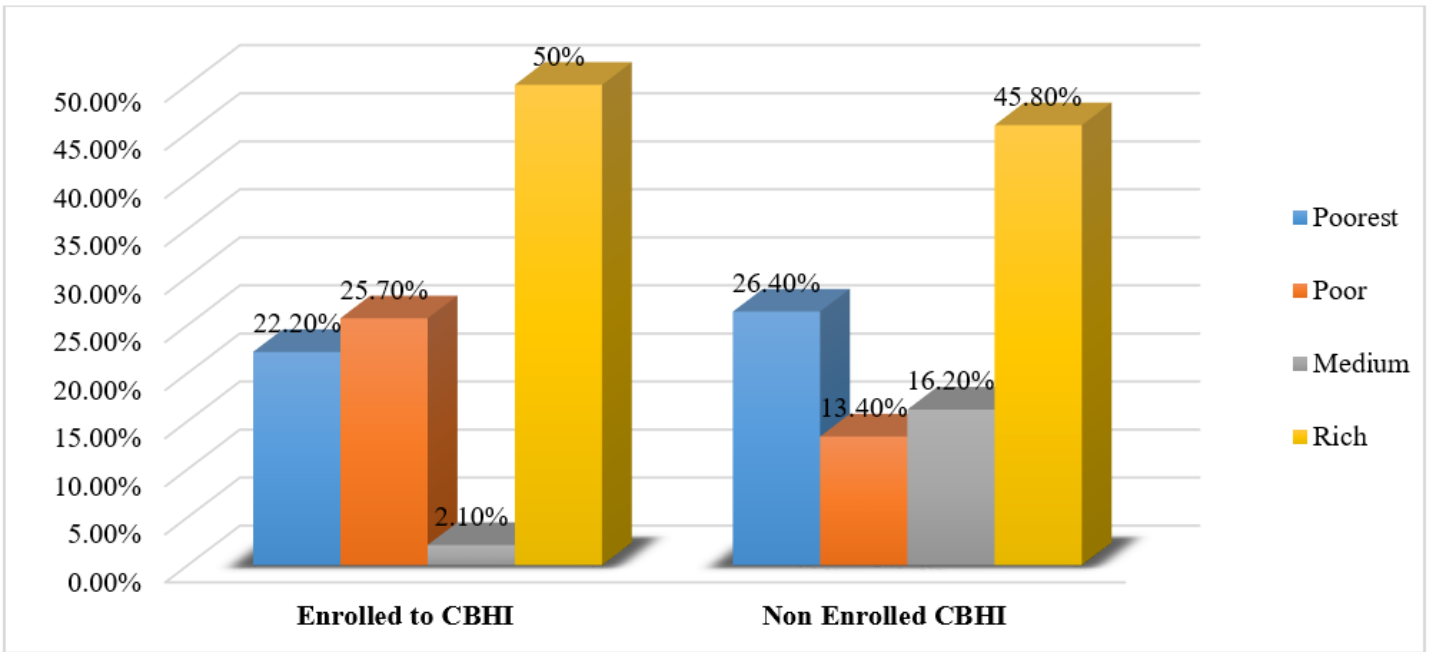
Figures

Figure 1

Sampling procedure

Figure 2

Wealth status category of study participants of East Wollega Zone 2022.