The Contribution of Community Based Health Insurance (CBHI) in Improving Access and Utilization of Healthcare Services: The Case of Adea District, East Shoa Zone, Oromia Region, Ethiopia

Project work submitted to the Indira Gandhi National Open University in partial fulfillment of the requirements for the award of the Degree- Master of Arts (Economics). I hereby declare that this work has been done by me and has not been submitted elsewhere.

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CERTIFICATE

Certified that the project work entitled *The Contribution of Community Based Health Insurance (CBHI) in Improving Access and Utilization of Healthcare Services: The Case of Adea District, East Shoa Zone, Oromia Region, Ethiopia* submitted by **Zelalem Abebe Segahu** is his own work and has been done in light of the evaluator's comments under my supervision.

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Acronyms/Abbreviations

CBHI	=	Community Based Health Insurance
CTP	=	Capacity to Pay
ETB	=	Ethiopian Birr
FGD	=	Focus Group Discussion
FMOH	=	Federal Ministry of Health
GTP	=	Growth and Transformation Plan
HSDP	=	Health Sector Development Plan
HSFR/HFG	=	Health Sector Financing Reform/Health Financing and Governance
HSTP	=	Health Sector Transformation Plan
ICE	=	Incidence of Catastrophic Expenditure
IPD	=	Inpatient Department
JBHI	=	Jami Bora Health Insurance
KII	=	Key Informant Interview
MHO	=	Mutual Health Organization
NCMS	=	New Medical Cooperatives scheme
NHE	=	National Health Expenditure
NHIS	=	National Health Insurance scheme
OOP	=	Out-of-pocket
OPD	=	Out Patient Department
OR	=	Odds Ratio
SES	=	Socio Economic Status
SNNP	=	Southern Nations, nationalities and People
UHC	=	Universal Health Coverage
USAID	=	United States Agency for International Development
VHCFP	=	Vietnam Health Care Fund for the Poor
VLSS	=	Vietnam Living Standards Survey
WHO	=	World Health Organization

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Abstract

The purpose of this study is to examine the contribution of Community Based Health Insurance (CBHI) in Adea District in improving access to modern healthcare and providing financial protection to CBHI member households. The district has 29,062 households out of which 26,156 are eligible for CBHI membership. Currently 12,341 households are enrolled in the CBHI scheme. Health insurance coverage rate in the district is 45%. The government provides support to the scheme in the form of providing targeted and general subsidies, covering operational expenditures, and providing leadership and technical support. The community is also involved in the governance system of the schemes by participating in the general assembly and board.

The study used binary logistic regression model to see if there is a difference in access to modern healthcare and exposure to catastrophic health expenditure. The sample size for the study was 280. The overall response rate was 96.43 percent. The study covered 126 CBHI member households and 144 non CBHI member households.

The analysis found significant positive effects of health insurance coverage in improving access of households to modern healthcare services (OR= 2.533). It is established in this study that CBHI member households in Adea Woreda are more likely to use health care services than non CBHI member households in the same Woreda.

 It also established that households with health insurance coverage have reduced chance of being exposed to catastrophic health expenditures (OR = 0.271). Members of Adea CBHI scheme were provided effective protection against catastrophic health expenditure.

Key Terms: Adea District (Woreda), Community Based Health Insurance, Health Service utilization, Catastrophic Health Expenditures.

1. Orientation to the Study

1.1 Introduction

Ethiopia is the second-most populous country in Sub-Saharan Africa with a population of 99.4 million, and population growth rate of 2.5% in 2015. One of the world's oldest civilizations, Ethiopia is also one of the world's poorest countries. The country's per capita income of $590 is substantially lower than the regional average (Gross National Income, Atlas Method) [1]. The government aspires to reach lower-middle income status over the next decade.

The government is currently implementing the second phase of its Growth and Transformation Plan (GTP II). GTP II, which will run from 2015/16 to 2019/20, and which aims to continue improvements in physical infrastructure through public investment projects is meant to transform the country into a manufacturing hub. The overarching goal is to turn Ethiopia into a lower-middle-income country by 2025. Currently, the health sector in Ethiopia is implementing the health component of the Growth and Transformation plan II named Health Sector Transformation Plan which has three key features; quality and equity; universal health coverage; and transformation.

As far as health is concerned, Ethiopia used to have poor health status in relation to other low-income countries although the facts seem to be reversed in recent years. Widespread poverty along with low income and education levels, inadequate access to clean water and sanitation facilities and poor access to health services due to various barriers have contributed to the high burden of ill-health in the country. The average life expectancy at birth is now 64.[2] The Infant Mortality rate is estimated at 48 per 1000 live births and under five mortality rate is 64 deaths per 1000 live births; Moreover, despite the various efforts of the government, Ethiopia still has a high maternal mortality ratio of 412/100,000 live births.[3] In Summary, such low health status of

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[1] The World Bank, Ethiopia Overview
[2] Federal Ministry of Health, Health Sector Transformation Plan (HSTP), 2015-2020
[3] Ethiopia Demographic and Health Survey 2016, Central Statistical Agency

the Ethiopian population is a cumulative result of various barriers including physical barriers, finical barriers, cultural barriers and governance problems.[4]

With the objective of mitigating the above obstacles, the Ethiopian government has been implementing various programs and initiatives which have led to the improvement of the performance of the health sector and the health status of the Ethiopian population in recent years. The expansion of primary care service through the massive construction of health posts, health centers & primary hospitals and through the deployment of 2 female health extension workers in each Kebelle[5] have alleviated the problem of physical access and contributed in mitigating the effect of cultural barriers on access to modern healthcare service utilization. Similarly, the implementation of various reforms such as the institution of fee-waiver system for the poor, provision of standardized exempted services for all citizens, setting and revision of user fees based on ability to pay of the population, and just recently the introduction of prepayment mechanisms contributed in the reduction of financial barriers to modern care and in reducing the impoverishing impacts of direct payments to healthcare on households.

CBHI was initially implemented in Ethiopia as a pilot program in 13 districts selected from four regions of the country. The pilot program was led by the Federal Ministry of Health, Regional Health Bureaus, and the local administrations. The Health Sector Financing Reform project funded by USAID and implemented by Abt Associates Inc. supported the pilot implementation program through the provision of technical assistance.

Available data suggest that the use of modern healthcare services has increased since the introduction of CBHI. A pilot evaluation study conducted in 13 CBHI pilot districts authenticated that CBHI was effective in increasing health service access to insured households and has provided effective protection to member households against catastrophic health expenditures.

The findings of the evaluation study showed that CBHI is meeting its objectives despite some challenges. The evaluation study among other things has indicated that CBHI has increased health service utilization by more than two fold. Likewise, by taking a 15% non-food expenditure threshold only 7% of CBHI members were found to face the risk of catastrophic health

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[4] World Health Organization, Ethiopia Facts
[5] The lowest administrative unit in the Ethiopian government structure

expenditure while for non-members 19% were exposed to the risk of catastrophic health expenditures. The evaluation study therefore concluded that CBHI was effective in improving healthcare access and in providing financial protection to its members against catastrophic health expenditures.[6]

The program has since then been scaled-up to more than 300 CBHI districts in the pioneer four regions and currently other regions are also at different preparatory stages to implement the program. No extensive study has been undertaken since then if the findings of the pilot evaluation are still valid in the new districts in particular and in the scale-up phase in general.

The purpose of this study is to investigate whether Community Based Health Insurance (CBHI) improves healthcare service utilization or not and if CBHI schemes are providing financial protection to their members against catastrophic out of pocket health expenditures by taking Adea CBHI scheme as a case study.

The research questions to be addressed in this study are:

1. Is there any variation in health service utilization between members and non-members of CBHI schemes?
2. To what extent does CBHI improve access to modern health care?
3. Does Community Based Health Insurance reduce out-of-pocket health expenditures for insured members as compared to non-members?
4. What situations lead CBHI members to incur OOP while having insurance?

1.2 Background to the Research Problem
1.2.1 Health Financing: the Macro Context in Ethiopia

Health services in Ethiopia are financed by four main sources. These are government (both federal and regional); bilateral and multilateral donors (both grants and loans); non-governmental organizations; and private contributions.

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[6] Evaluation of CBHI Pilot Schemes in Ethiopia, Ethiopian Health Insurance Agency, 2015

The fifth round (2010/11) of National Health Accounts (NHA) indicates that the country's total health expenditure is growing steadily both in gross and per capita spending. The National Health Expenditure (NHE) increased from 11.1 billion ETB (US$1.2 billion) in 2007/08 to more than 26.5 billion ETB (US$1.6 billion) in 2010/11, while the per capita NHE increased from US$16.09 per capita in 2007/08 to US$20.77 in 2010/11. Despite the increase, the per capita NHE amount remains far below the Health Sector Development Program (HSDP-IV) per capita spending target of US$32[7]. The amount is also low compared with other sub-Saharan African countries. For instance, 49 low-income countries on average spent $22 per capita in 2006 (WHO 2010). As noted above, it also is by far much less than the US$34 per capita recommended by World Health organization (WHO) in 2001. The minimum per capita spending recommended by the WHO high-level Taskforce on Innovative International Financing for Health Systems has been updated which suggested that by 2009 a low income country needed to spend on average US$ 44 per capita to strengthen its health system and to provide an essential package of health services and this estimate has increased to a little more than US$60 per capita by 2015[8]. Thus, the health sector in Ethiopia is still underfinanced and requires substantial increases in the current levels of health expenditure to further improve health service access by the Ethiopian population. However, it should also be noted that Ethiopia fares good in terms of relatively better health outcome despite the low level of Per capita expenditure when compared with peers.

Moreover, in terms of source of financing, the Ethiopian health sector is largely financed by the rest of the world (36 percent), and households (33 percent) which are burdened by high out-of-pocket (OOP) expenditures. Direct payments at the time of sickness are considered unsuited since they inhibit access for the poorer people due their direct contribution to the risk of impoverishment.

On the utilization dimension, health service utilization rate of modern healthcare in Ethiopia computed as the ratio of outpatient visits to the total Ethiopian population in 2016 was 0.63 per person per year. [9]This is a very low figure when compared with the 2.5 visits per person per year standard recommended by the WHO.

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[7] Ethiopia's Fifth National Health Accounts Highlight of Major Findings Briefing Notes
[8] WHO Expenditure Atlas for African Region 2014
[9] Health and Health related indicators, Federal Ministry of Health, 2016

Ethiopia is currently striving to improve access to modern health services and reduce the impact of such high OOPs through two types of health insurance; social health insurance and community-based health insurance. The social health insurance system, which is mainly payroll-based, will cover employees in the formal sector while community-based health insurance will cover the rural population and the informal sector population in urban areas.

Adea district which is found in East Shoa zone of Oromia regional state shares all the scenarios described above. The residents of the district have low health service utilization and face the risk of catastrophic health expenditures when seeking care at the time of illness. In line with the national and regional directions to scale-up CBHI schemes, the district started CBHI implementation in 2015 with the main objective of removing the financial barrier to health service access for its residents.

1.2.2 Background to Community Based Health Insurance

As mentioned earlier, direct payments have serious repercussions for health. Making people pay at the point of delivery discourages them from using services and encourages them to postpone health checks. This means they do not receive treatment early, when the prospects for cure are greatest. It has been estimated that a high proportion of the world's 1.3 billion poor have no access to health services simply because they cannot afford to pay at the time they need them.[10] They risk being pushed into poverty, or further into poverty, because they are too ill to work. As a response to this undesirable consequence of high direct payments for health care, developing countries, particularly Sub-Saharan Africa countries opted for innovative coping mechanisms in the shape of community based health insurance schemes over the last few decades.

Anticipating the benefits, Ethiopia has considered the implementation of CBHI and has developed a health insurance strategy in 2008 which calls for the pilot implementation of the program and gradual scale-up.

The implementation of CBHI was started as a pilot program and was later scaled-up to include more districts. Under community based health insurance system, each district of Ethiopia, or

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[10] The World Health Report, Health Systems Financing, the Path to Universal Coverage, WHO 2010

Woreda[11], will have a collective health fund to which participants will contribute to. Enrollment is done at a household rather than individual basis.

The poor are eligible for membership in community based health insurance schemes. The contribution of the poor is covered by joint budget allocations from the local (district/Woreda) administrations and the regional governments. The federal government also provides a 10% subsidy to the CBHI schemes based on the contributions they mobilize from the paying and the indigent members. The beneficiaries are entitled to a package of services that are available in public facilities with no copayment required at the time of service. In some districts beneficiaries can get service from non-public providers whenever the prescribed service is not available in the public facilities. During the pilot phase contributions used to vary from ETB[12] 126 to ETB 180 per household depending on the decision of the regional steering committees based on the feasibility studies of the regions before launching the pilot. During the scale-up phase the contribution amount has been harmonized to be uniform across districts and regions to pave the way for formation of larger pools.

Administrative expenditures such as salary of CBHI executive staff, office supply expenses, office utility expenses etc. are covered by the government from the treasury. On top of this government also provides office space to the schemes and plays the role of general stewardship in the implementation of CBHI.

Ethiopia is now one of the countries to have reached significantly high rates of enrollment in a short period of time. With more than twelve million beneficiaries enrolled to the CBHI schemes so far, the average enrollment rate in the CBHI implementing districts is now 33% of the eligible population while the national coverage of the schemes by taking the entire Ethiopian population as a base is 13%.

In Ethiopia, the impact of the CBHI program in increasing utilization of health care services and enhancing financial protection by decreasing out of pocket expenditure was found to be very positive as expected in the pilot designs (CBHI Pilot Evaluation, Ethiopian Health insurance Agency, 2013). According to the findings of the pilot evaluation, members were more than two

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[11] An administrative structure in Ethiopia with an average population of about 100,000 or 20,000 Households
[12] ETB is Ethiopian Birr which is the Ethiopian currency unit(currently 1 USD is about 23 ETB)

times more likely to visit healthcare facilities when sick than non-members. This has been one of the trigger factors for the scale-up decisions by the Ethiopian government. Studies by other researchers on the impact of the Ethiopian CBHI schemes on health care access also showed the program as having a positive effect in increasing access to modern health care. The studies show that prior to the implementation of CBHI the share of outpatient care utilization of insured and uninsured households in pilot districts was almost similar (38 percent for insured and 39 percent for uninsured). In the post-CBHI period, the utilization of outpatient care shows an increase for the insured while it declined for non-insured households.

1.3 Objective of the Study

The purpose of the study is to determine whether Community Based Health Insurance (CBHI) contributes in improving health care access to its members and whether it is effective in enhancing financial protection from catastrophic health expenditures to insured households. Evidence of the contribution of Community based health insurance in promoting healthcare access will be determined by comparing if there is any differential between members and non-members in the likelihood of healthcare utilization.

 Likewise, the contribution of community based health insurance in enhancing financial protection from catastrophic expenditures will be analyzed by comparing the Out-Of-Pocket health expenditures (OOPs) by CHBI members with OOPs by non-members.

1.3.1 Specific Objectives

The specific objectives of this study are therefore to

1. Analyze the extent to which CBHI improves access to modern health care to its members as against non-members
2. Assess the degree of financial protection provided to CBHI members as opposed to non-members
3. Suggest recommendation that would improve the performance of Adea CBHI scheme in particular and CBHI program in Ethiopia in general in light of improving financial access and reducing the catastrophic impact of OOP on households.
4. Contribute to the CBHI body of knowledge

1.4 Statement of the Problem

The welfare monitoring survey carried out in 2011/12 showed that the prevalence of illness was 16.9% i.e. about 13 million persons reported that they have health problems at least once over the two month period prior to the survey. As to the incidence of consultation, the survey revealed that at country level only 61.9 percent of the population (8.1 million persons) who had health problem had consulted for treatment. Only 59.47 percent of rural population who reported health problem consulted for medical assistance compared to 75.3 percent of the population in urban areas. More recent data of the Federal ministry of Health shows that the average OPD visit of the Ethiopian population is 0.63 per person per year which is far below the WHO standard of 2.5 visits per person required to maintain good health

The welfare monitoring survey result indicates that close to one third of the total population (29.6%) who had health problem and consulted for medical assistance reported that the service is too expensive to consult. Other notable barriers for lack of consultation by people who reported sick were problem of unavailability of drugs (18.1%), long waiting time (16.0%), lack of laboratory facilities in the health institutions visited (18.1%), shortage of health personnel and medical equipment (7.7%), and health facility staff not cooperative (7.3%); (Central Statistical Agency, 2012).[13]

The burden of direct payments for health by households can be verified from the fifth National Health Account which showed that OOP payment by household constitutes about 34% of the total health expenditure of the nation. This very high proportion of OOP payment has a potential to be catastrophic and impoverishing. In fact the WHO recommends OOP payments in a country should not exceed the threshold of 20%[14] of the total health expenditures of that country beyond which all figures are considered to potentially have catastrophic effects.

With the above background in mind, Community Based Health Insurance was initiated in Ethiopia with multiple objectives among which increasing healthcare access of the rural population and enhancing financial protection to them were part of the objectives set for the program.

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[13]Ethiopian Welfare Monitoring Survey, 2012
[14] WHO Macroeconomic Commission for Health, 2014

Apart from the findings of the pilot evaluation and a few studies conducted on the pilot districts, new concrete evidence is yet to come about the contribution of community based health insurance in increasing healthcare utilization and improving financial protection on a sustainable basis.

1.5 Significance of the Study

There have been some studies conducted on the performance of community based health insurance in Ethiopia since its initiation in 2011. The studies conducted so far on Ethiopian CBHI including the pilot evaluation study confirmed that the CBHI program is meeting its objectives despite some challenges. There have also been a number of studies undertaken by various researchers on community based health insurance schemes elsewhere where some confirmed the contribution of the schemes in improving healthcare access and reducing OOP and others disproved these arguments.

The studies that have been conducted so far are however somehow obsolete since there are changes in the operation, follow-up and support of schemes.

There is therefore still the need to investigate empirically the role of community based health insurance in improving access to healthcare and reducing the effect of catastrophic health expenditures.

The study also hopes to generate evidence that will be used by policy makers to make informed policy decisions as far as CBHI is concerned.

1.6 Scope and Limitations of the Study

The study will focus on data collected from one CBHI scheme. Any generalization that will be made based on the findings of this study may therefore have limitation in applying in other settings. Moreover, the study covers the Kebelles which are accessible and relatively proximate to a health facility affecting their health seeking behavior. Hence, there is a possibility of self- selection where residents are more likely to enroll to CBHI schemes because of their high level awareness about the benefits of modern health care services.

1.7 Organization of the Thesis

The study will be organized in five parts: Chapter one contained the introduction to the study. It provided background information about the research problem, the context of health financing sources and background to CBHI. Discussion on the significance of the study, the research objectives, statement of the problem, scope and limitation, and definition of key terminologies are contained in this chapter.

Chapter two reviews the literature on CBHI. Theoretical background to CBHI, concept of CBHI, evolution and taxonomy of CBHI, empirical evidence on the impact of CBVHI on healthcare access and financial protection, as well as potential benefits and outcomes are discussed. A discussion on key design elements of the Ethiopian CBHI model is also included in this chapter.

Chapter three is research design and method. It discusses the research design followed and possible covariates and the research method used.

Chapter four is analysis, presentation and description of the research findings.

Chapter five is Conclusions and Recommendations. It highlights the major findings of the study on the basis of the discussions. It draws general conclusions relating to the role of community based health insurance in improving health care service utilization and financial protection in Adea district in particular and in Ethiopia in general. It also contains policy recommendations that the author believes would improve the performance of the CBHI scheme under study and other CBHI schemes throughout the country in respect of the research questions.

1.8 Definitions of Key Concepts

Community Based Health Insurance (CBHI); An emerging concept for providing financial protection against the cost of illness and improving access to quality health services for low-income rural households and other informal sector that are excluded from formal insurance. It is non-profit type of health insurance, formed on the basis of the principle of solidarity and cross subsidization, in which members generally participate in the management of the scheme.

Financial Protection; The situation in health financing that is achieved when direct payments made to obtain health services do not expose people to financial hardship and do not threaten living standards.

Out-of-Pocket (OOP) Expenditures for Health Care Services; Any direct outlay by households to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or enhancement of the health status of individuals. It is a payment made by an individual patient directly to a health care provider, as distinct from payments made by a health insurance scheme or taken from government revenue.

Catastrophic Health Expenditure; includes that out-of-pocket payment for health that can cause households to incur a significant proportion of their income on healthcare. The usual threshold is when health expenditures exceed 40% of a household's non-food expenditure. However in low income countries the threshold taken is 15-20% of non-food expenditure and hence any figure beyond this is considered catastrophic.

Health Service Utilization: The measure of the population's use of the health care services available to them in a specified period.

2 Review of Related Literature

2.1 Theoretical Background of Health Insurance

Heath insurance has been developed to its current state in response to the various issues and challenges surrounding health financing. The drivers and actors behind the development of health insurance in high income and low income countries might vary slightly due to differences in economic, political, social and cultural contexts of the countries. However, in general we can assume that the theoretical frameworks to introduce health insurance are motivated by theoretical arguments that have emerged in the context of wealthy countries. It might be arguable how the experience of these wealthy countries can be relevant to the low income countries. The theory of health insurance fundamentally builds on the law of large numbers. According to the law of large numbers, it is possible to predict the behavior of individuals or a larger group than the behavior of a small group or just a single individual. This law helps market players to make their choices rationally. Viewed from the perspective of insurers, the law of large numbers enables them to pool individual risks since they can reasonably make near accurate predictions about their expected payouts. Regarding demand, the demand for health insurance is derived from the demand for healthcare services. The demand for healthcare services is influenced by a number of observable and unobservable factors including income, education, health status, age etc. The conventional model of demand which assumes maximization of utility with in a budget constraint and according to the preference of individuals may not hold for demand for healthcare services. Consumers of healthcare services are uncertain over the quantity and type of care they need. Due to this high level of information asymmetry, the consumption decision of healthcare services very much depends on third parties who hold the necessary information due to their professional authority. Due to the prevalence of high information asymmetry in healthcare markets, unlike the market for other goods & services, it is difficult for consumer of the services to assess the quality of the services before receiving as well as retrospectively.

The problem of information asymmetry in the health service market leads to two most common market failures in the health insurance industry namely adverse selection and moral hazard. (Jowett, 2004)

2.2   Theory of Adverse Selection

Health insurance markets require the fulfillment of several conditions in order to spread risks efficiently. The first condition that must hold true is that probability of individuals falling ill must be known. This condition is important to allow the risk bearer to make accurate prediction about the frequency and severity of the claims in a given year or time period. The second condition that must be satisfied is that the risks must be largely independent of each other. This allows the insurer to share the risks among the members of the insurance since the loss of one member would be covered by the contribution of other members due to their independence where the probability of loss to all members by a single event is rare. The third condition for an efficient health insurance market is that the probability of an individual needing medical care must be lower than one. Once the probability is 1 it means that the event will certainly happen and insurance will no more be a risk transfer mechanism. The difficulty of maintaining the above three conditions due to information asymmetry leads health insurance markets to the phenomenon known as the "Lemons problem" as coined by Akerlof. In markets where this problem prevails, the customer knows less than the seller about the seller and its products. However, in health insurance markets, this position is reversed and it is the insurance scheme i.e. the seller that lacks information about its clients. The consumers (the patients) have better information about their health status rather than the insurer. Hence, due to biased information provided by patients in favor of good health, the actual number of claims and the payout will generally increase and the premiums charged at the inception of the insurance will not be sufficient to cover the expenses. Realizing the situation the insurers tend to load the premium they charge in the next underwriting cycle. This scenario of increasing premium will force people with good health status to decide not to buy the insurance products. The customer base that will be remaining with the insurance would then be people with some form of health problem which leaves the insurer with no option but to revise its premium charges to cover its costs. In general, a vicious circle of increasing average cost and increasing premium would develop. (Jowett, 2004)

Insurance funds institute various mitigation mechanisms to control the impact of adverse selection including medical screening, group enrollment, mandatory membership, waiting periods before exercising benefits etc. Empirical evidence from lower income countries, shows that the problem of adverse selection is observed in the decision to enroll in health insurance schemes.

For example, a study conducted in Ghana identified that willingness to pay for health insurance increases with income as well as in households that have recently faced high health expenditure and difficulty in making the payment for those health expenditures (Asenso Okyere, 1997).

2.3 Theory of Moral Hazard

Moral hazard refers to the tendency of insured individuals to increase their consumption of healthcare service. Moral hazard is considered as a major risk factor for health insurance schemes deterring them to become efficient risk sharing mechanisms. Moral hazard could occur both from the demand side and the supply side. On the demand side, individual may change their consumption behavior of health & health related services on account of their membership to an insurance scheme. A more unlikely change of behavior is when individuals reduce their consumption of preventive care since they would be less worried about the financial implications of falling sick. This is known as ex-ante moral hazard since it relates to behaviors before illness. Ex-ante moral hazard is not considered a major problem to the health insurance market. A second form of demand side moral hazard is ex-post moral hazard which refers to the increase in the quantity and quality of the consumption of health services once an individual falls sick. With insurance, the marginal cost of consuming health care is lower than the marginal benefit and patients would push for more quantity and better quality of services. Ex-post moral hazard is a common phenomenon of the insurance market and insurance funds introduce various mitigation measures including application of copayment, putting benefit caps and using other qualitative restriction such as use of genetic drugs.

As stated earlier, moral hazard could also emanate from the supply side. Supply induced moral hazard happens due to the behavior of healthcare providers to maximize their revenues. Healthcare providers prescribe services that are not considered necessary for the patient. Mechanisms used by insurance schemes to mitigate the impact of supply induced moral hazard include application of appropriate payment mechanisms and undertaking regular medical auditing of the health facilities.

Empirical evidences on the impact of moral hazard in the insurance schemes of lower income countries are available from countries such as Vietnam, Ghana etc. Analysis done on the Vietnamese VLSS by Trivedi concluded that health insurance has a strong positive effect on the

use of outpatient services at public hospitals. Another study conducted in Ecuador by Waters (1999) concludes that being a member of a health insurance scheme has strong positive effect on the use of curative healthcare services. Another general conclusion made by Ron (1999) is that since health insurance makes health care services more affordable it is natural to expect rural and low income households that are members of an insurance scheme utilizing more healthcare services than non-insured households. (Jowett, 2004)

2.4 The Concept of Community Based Health Insurance (CBHI)

As stated in the introduction section of this study many low income and developing countries have challenges in financing their health. The low level of the formal sector economy coupled with weak legal and institutional structures to collect and administer formal taxation systems force these developing countries to explore other financing options. Community based health insurance schemes emerged as a response to these challenges of developing countries. Many developing countries have implemented community based health insurance with design features varying depending on the context of the countries. Community based health insurance aims to provide financial protection to members of the scheme. The members make prepayment contributions to a common pool and full or partial healthcare costs that members face when falling sick are covered from the common pool. They are typically non-profit organizations and are usually managed and owned by the community who formed them. CBHI schemes are suitable financial protection tools to developing countries where most people are self-employed or informal sector workers making it difficult to reach through formal tax based or payroll based insurance mechanisms. Members of CBHI schemes are usually people who share similar socio-economic profiles and who have more or less similar cultural and behavioral makeups.

The members of CBHI schemes are ready to commit resources on voluntary basis to a common pool from which members with a mishap would be supported. CBHI schemes traditionally used to be small in size and are prone to various sustainability challenges.

To conclude, CBHI has been defined in various ways and its specific characteristics vary. Nevertheless, these schemes share certain basic features, including community initiation and operation, voluntary membership, and prepayment membership contribution. A broad working definition of a CBHI scheme is any scheme managed and operated by an organization, other than

a government or private for-profit company that provides risk pooling to cover all or part of the costs of health care services. (WHO 2001:60).

2.5 Evolution and Taxonomy of CBHI Schemes

Community based health insurance came in to the picture of health financing prior to social health insurance in the form of workers cooperatives and solidarity groups in Germany and other developed countries. However, the development of community based health insurance as we know it today emerged through the voluntary association of local communities in low income countries. The burden of high cost of health services and the limited capacity of government to establish formal protection mechanisms in these low income countries led to the initiation of local solidarity groups.

Commonly, community based health insurance schemes used to be initiated either by the will and demand of local communities, cooperatives, and non-governmental organization who want to shield their constituencies from high medical cost or by health providers who want to ensure continuity of their business through assured flow of customers with a means to pay their expenses. More recently community based health insurance is being the core development agenda of developing countries with its potential to foster the move to universal health coverage that is well appreciated by governments and the international community. In addition to its role in the move to universal health coverage (UHC), CBHI is also considered important for developing countries in light of its contribution in promoting good health which in turn leads to increased productivity apart from releasing funds for other productive investments from non-productive health service investments. Furthermore, governments in developing countries are bound by international conventions and commitments to make health care services accessible to their citizens in an equitable and sustainable manner. These commitments force the governments to identity innovative health financing mechanisms. The implementation of community based health insurance is now seen as an alternative source of finance for health in the developing countries. CBHI is not only considered as a good mechanism to promote financial protection to the majority of the population but also as mechanism to foster cost sharing with governments whose fiscal space is limited due to a number of competing development priorities. Community based health insurance is currently being implemented in a number of low income countries with designs

slightly varying across countries depending on their context. In some countries community based health insurance schemes are run purely by their members with no support or involvement by the government. In other contexts, governments play an active role in implementing and leading CBHI programs. Wang and Pielemeier identified three stages of CBHI development each mainly differing on the role and involvement of government in the operation of CBHI schemes. The three models of CBHI identified by Wang and Pielemeier are the basic model, the enhanced model and the nationwide model. The three stages can be understood as options which countries can pick up for implementation. They are not necessarily sequential and a country for example might start implementation at the third stage without the need for passing through the earlier stages. By way of recommendation, the authors echo that while it is possible to have these three models of CBHI schemes, the ultimate goal of governments should be to adopt the third model (the third stage). The nationwide model allows governments to integrate CBHI in their broad national health financing strategy so as to realize their universal health coverage ambition. (Wang & Pielemeier, 2012)

The three models (stages) of community based health insurance as identified by Wang and Pielemeier are the following.

2.5.1 The Basic Model

The basic model of CBHI, also known as the generic model, is considered as the classical CBHI model that is entirely operated by its members. It is the prototype of bottom up financial protection for the informal sector. The basic model is purely initiated and operated by the voluntary participation of a local community who share common interest due to their membership to a group defined by geography, professional affiliation, ethnicity etc. CBHI schemes at this stage of development are small in size and usually face challenges of sustainability.

2.5.2 Enhanced Model

This is one step advanced model of the generic model where various enhancement strategies such as local government political endorsement, coverage of the poor through subsides, building of networks for better scheme management etc. are introduced to improve the sustainability and equity of the scheme.

The strengths of the enhanced model of CBHI over the generic model of CBHI include

- Better political legitimacy due to support of local governments
- Equitable CBHI coverage as a result of inclusion of the poor through the subsidy of local governments
- Opportunity to bailout CBHI schemes by government in case of unexpected expenditure fluctuations
- Better opportunity to form networking between CBHI schemes allowing them to learn experiences in scheme management
- Opportunity to establish higher level pools through networking that can play the role of reinsurance functions
- Opportunity to have control on adverse selection by introducing group enrollment requirements

2.5.3 Nationwide Model

The nationwide model is the most advanced model of CBHI. This model requires a top down consolidation strategy that allows the full scale up of CBHI in a country. There is high political commitment and stewardship at the national level. The implementation of the program is backed by appropriate legislation. The nationwide model also allows for CBHI schemes to be big in size such as at regional or higher levels. This opportunity introduces risk equalization mechanisms through cross subsidization of high risk and low risk regions. Regular government budget support to the scheme also improves the sustainability of the program. Furthermore, the active involvement of the government in providing leadership, financial & technical support and in establishing strong monitoring and evaluation systems enhance the operation of the scheme to be efficient, effective and more sustainable. The nationwide model is the model that developing countries should work to put in place in their health financing system. It has the potential to lead lower income countries to universal health coverage. However to ensure long-term sustainability of the nationwide model developing countries must take the following measures

- Increase the uptake of the program by reaching hard to reach population groups
- Monitor the unit cost of providing health services to protect households from increase of contributions that may push them to drop out of the scheme.

- Integrate CBHI with other insurance mechanisms such us with tax based systems or with social health insurance systems to facilitate subsidization by the formal sector population.

In summary, the characteristics of the three models of CBHI are shown in the following table.

Table 1: Key characteristics of CBHI models

Characteristic	Basic Model	Enhanced Model	Nationwide Model
Participation	Voluntary on payment of contributions	Both poor and non-poor in a local community	Majority of target population nationally
Source of Revenue	Membership prepayment	Non-poor self-pay the their own contribution, Local government pays contribution of the poor	Non-poor self-pay the contribution, local government pays contribution of the poor Government financial subsidy to the scheme
Risk Pooling	Participants within local community	Possible cross-subsidy among communities at regional sub-regional level	Cross-subsidy across communities with risk equalization mechanism
Fund Management	Managed by community committee	Community management by a network of technical support	Professional management with the strength of community participatory roles
Role of Government	Licensing, minimal support	Local government political endorsement and financial support	High political commitment and stewardship at national level with legislation backup

Source: Wang & Pielemeier, 2012

2.6 CBHI and Access to Modern Healthcare

Access in healthcare is a concept that is complex and has to be evaluated from different perspectives. The access created to a population is ultimately expressed in the utilization of health services. There are many factors that can influence a population to increased or decreased utilization of health care services. The most important factors that affect utilization include socio-economic status (SES), Healthcare services supply, policies and strategies of a country, risk behaviors of a population, and health status of individuals. In a particular community differences

in utilization of healthcare services are accounted more on socio-economic and health status of individuals than the other three factors mentioned above. The reason for this is that policies and strategies of a country, health care services supply and risk behaviors in a community are usually expected to be uniform and may not be the most important factors leading to differences in healthcare utilization among members of a community.

It is assumed that socio-economic status (SES) of a community, a composite measure based on education, income, and demographic characteristics (sex, age, and ethnicity), has substantial influence on utilization of healthcare services. Socio-economic status directly affects important drivers to healthcare service utilization such as need, recognition, and response to symptoms; knowledge of ill health; motivation to get in good health; and choice of health services. Studies conducted in various countries show that persons with lower SES experience a greater degree of exposure to disease while they utilize less the health services required to restore their health.

Health status is also an important factor related with increased or decreased health care utilization as the case may be. There is considerable reliable evidence which shows that lower health status of a population directly results in increased health care utilization of all types.

Risk behavior of individuals also has its own impact on healthcare utilization. Other things being equal, people who smoke for example are likely to be exposed to some health problem and will be utilizing healthcare services than nonsmokers.

Health insurance status which reduces the financial burden of health services consumption is a major contributor in utilization of healthcare services. All other things being equal, people with health insurance tend to consume healthcare services more than people who have no insurance coverage. In fact, insurance coverage induces more consumption of healthcare services that may be excessive.

As to the empirical evidence there is well documented evidence that CBHI contributes for an increase in health service utilization.

A study conducted in Ghana to analyze the effects of the National Health Insurance Scheme (NHIS) on the probability of utilizing outpatient care using logistic regression model by taking

data through household survey from 384 randomly selected individuals indicated that insured respondents were more likely to utilize outpatient care than were their uninsured counterparts.

A study undertaken by Sennen Hounton et al. in rural Burkina Faso using a descriptive and a logistic regression analysis to assess the effectiveness community-based health insurance has on utilization of health services showed a positive association between CBHI membership and healthcare service utilization. The study concluded that there is a statistically significant association between membership of the Nouna CBHI scheme and the utilization of health services after adjusting for the covariates. (Hounton, Byass, & Kouyate, 2012)

In Kenya a study conducted by Judy Wanja Mwaura & Sathirakorn Pongpanich in Jamii Bora Trust (JBT) microfinance institute where there is an insurance plan called Jami Bora Health insurance (JBHI) indicated that insured members who have health insurance coverage were more likely to be hospitalized compared with non-insured members of the microfinance institute. The study showed among respondents who reported having been hospitalized in the previous 12 months preceding the survey, 20.5% were insured and 15.2% were not insured. Among respondents who had been hospitalized for surgery treatment, (28.2%) were insured while (20%) were not insured. (Mwaura & Pongpanich, 2012)

A study by Zhiyuan Hou and et al found clear evidence that adoption a CBHI like new cooperatives medical scheme (NCMS) raises the probability of using both inpatient and outpatient care.

A systematic review on the impact of health insurance schemes for the informal sector in Low- and Middle-Income Countries by Arnab Acharya et al. showed mixed results. Out of the 15 studies reviewed 9 studies showed CBHI contribution as having an increase in utilization of healthcare services. In Ghana a study by Mensah, Oppong and Schmidt in 2010 stated a higher utilization rate for pregnancy care among the insured. For Nicaragua the study by Thornton and Field in 2010 insurance schemes established mostly for the poor did not bring higher utilization rates. The same has been true in the study conducted in Georgia by Bauhoff et al. in 2010 except the higher utilization rate reported for people with higher asset bases. In Burkina Faso the study by Gnawali et al. in 2009 and in India the study by Aggarwal 2010, reported the contribution of community-managed schemes in increasing an overall health care use but with no

impact on inpatient utilization. Studies conducted by different authors at different times in Colombia indicate affirmative effects of health insurance schemes on healthcare service utilization. The studies however report no difference in inpatient care for insured and non-insured groups. In Mexico studies made on Seguro Popular reported opposing results. A study by King et al. in 2009 account no higher utilization for the insured for all types of health care while another study by Sosa-Rubi et al. in the same year account that diabetic patients insured under Seguro Popular have better access to care compared to patents who are not insured. In Vietnam three studies of Vietnam health care fund for the poor (VHCFP) brought conflicting results. One study by Adam Wagstaff in 2007 found that insured people have higher utilization rates for inpatient and outpatient care. A second study by Axelson et al. in 2009 found a small increase in overall utilization. The two studies however used different data although the methodology they followed was similar. A third study by Wagstaff in 2010, which used a different data and methodology than the earlier studies, found no effect of insurance on utilization. In China, contradictory results came out from two studies on NCMS. The study by Wagstaff et al. conducted in 2009 showed that the insured, utilize health services more often in comparison to the noninsured. On the other hand a study by Lei and Lin in 2009 found no overall effect of health insurance on utilization except the drop in the use of traditional care and an increase in preventive care.

The review concludes that it is difficult to claim insurance leading to a higher utilization of care and different results can be found for the same insurance depending on the design and other contexts. (Acharya, et al., 2012).

In the case of Ethiopia a study conducted by Anagaw Mebrtae et al. on a panel data of 13 CBHI pilot districts showed that at the beginning of the pilot period (2011), the share of insured and uninsured households utilizing outpatient care from health facilities was almost uniform at 38 percent for insured and 39 percent for uninsured. After the introduction of CBHI in these districts, the utilization of outpatient care showed an increase for the insured while it declined for non-insured households. When utilization only from public facilities was considered the authors showed that the increase in health service utilization for insured households was substantial. (A. Mebratie et al. 2015)

An evaluation study conducted in the pilot program also confirmed the positive association between being a member of an insurance schemes and increased health service utilization. The evaluation showed that CBHI members are more than two times likely to utilize health service than non-member households.

2.7 CBHI and Financial Protection

As discussed in various sections of this study the way health services are paid by households influences if that household is to face risk of facing catastrophic expenditures and being led to impoverishment after incurring the health expenses. Accordingly call have been made by the international community and the governments of developing countries to have a health financing strategy that promotes financial protection to citizens in general and the poor in particular. Various declarations and initiatives namely the Alma-Ata declaration, the Abuja declaration, the Bamako initiative and more recently the Addis Ababa Action Agenda affirmed by leaders for the achievement of sustainable development goals are all intents calling for the commitment of different stakeholders to make accessible essential health services to all with adequate financial protection. Developing countries are now revisiting their health financing strategies with a focus on how to raise more revenue for health services from domestic sources with participation of the community. However, there is no universally accepted pathway that countries can adopt that increases self-reliance and individual/community participation. There are still unanswered questions as to whether, how, and how much poor people in developing countries would contribute to finance healthcare services.

Studies conducted in a number of developing countries have shown that an individual health status and ability to cope with mishaps due to illness are intertwined with the amount of material wealth that the individual commands. A person with a low income might be unable to afford for preventive or curative care services. This inability to afford for the health services might lead to a vicious downward spiral where poor health exhausts assets leading to low level of income and this low level of income leading to deteriorating health condition and inability to deal with any future ill health. The significance of CBHI is being acknowledged as one of the mechanisms to provide financial protection against catastrophic health expenditures to the poor and citizens in the informal economic sector. CBHI being a community health financing mechanism seems

appropriate for low-income countries where there is limited fiscal space to the governments and an over reliance on out-of-pocket spending. CBHI being a prepayment mechanism separates the time of payment from the time of use of services which is relevant for rural household due to seasonal variations in their incomes. CBHI protects individuals and households from the risk of catastrophic medical expenditure in return for a regular payment of contributions. Prepayment schemes, even with no element of pooling in them, can facilitate access to care, since they spread costs over time and prevent people from having to pay at the time of treatment. CBHI schemes contribute to the enhancement of equitable access to health care and offer financial protection to their members. In CBHI schemes, the contribution amount for a single individual is not related to the likelihood that a single individuals will fall ill. Furthermore, the benefit package id designed on the basis of need. Payments under the health insurance system go to the members who faced some ill health problem who are likely to be people with lower income.

In developing countries, OOP spending remains the major way of health financing. These low income countries rely heavily on OOP spending and only a small proportion of their total health expenditure comes from general revenue. It has also been established by various researches that OOP is a highly regressive and inequitable way of financing healthcare and has been documented as a cause of significant catastrophic spending in low income countries. Limited by their inability to raise sufficient revenue through general taxation and social health insurance, developing countries have resorted to CBHI as an innovative financing mechanism and feasible financial protection tool to their citizens.

The provision of financial protection to its members is also another important goal of CBHI schemes. There is no consensus in the threshold limits or cutoff values to measure the contribution of CBHI in providing financial protection. Usually, the proportion of households in low income countries that incur out-of-pocket health expenditures beyond 15-20% of non-food expenditure are considered to have faced financial burden as a result of health expenditure.[15] In this study, the system of measuring financial protection through the reduction of OOPs which lead to catastrophic health expenditure is considered. In Ethiopia, CBHI program was designed in such a way that poor households would become members to the schemes where their

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[15] WHO Report Health financing, 2010

contributions are covered by the local and regional administrations. Furthermore, all schemes were given a general subsidy from the government so that contribution would be affordable for those who are expected to pay their contributions. As all direct expenditures related with a sickness are covered by the CBHI schemes, it is also expected that the members would be better off than non-members on the probability of being exposed to catastrophic and potentially impoverishing health expenditures. This has been supported by the findings of the pilot evaluation where members were less likely to be exposed to catastrophic health expenditures than non-members. (Spaan, et al., 2012)

There is wide evidence from around the world showing that CBHI schemes are able to reduce OOP payments and reduce catastrophic health expenditures. A study carried out by Michael Kent Ranson in Gujarat, India showed that CBHI schemes reduced catastrophic health expenditure from 35% (uninsured) to 15% (insured). He concluded that CBHI undeniably provided some financial protection to claimants (Ranson, 2002). Another study conducted in India by Narayanan Devadasan et al. showed that insured families spent much less OOP than non-insured families thereby reducing the probability of catastrophic health expenditure to nearly half for the insured families. The study showed that all of 683 and 3152 patients who needed hospital admissions at two schemes covered by the study could have paid high OOP in the absence of Community based health insurance and both CBHI schemes halved the number of households that would have experienced catastrophic health expenditure by covering hospital costs. (Devadasan, Criel, Damme, Ranson, & Stuyft, 2007)

Evidence from China showed new cooperatives medical scheme (NCMS) a form of CBHI was found to be linked with increased supply of drugs and availability of medical equipment in rural health facilities. A study by Zhiyuan Hou indicates that NCMS extends financial protection, by reducing the share of OOP spending for an inpatient and outpatient visit although the effects are relatively small. This study further stated a concern that NCMS was linked with increased total spending per outpatient visit as well as per hospitalization. The study explained such increase as being the effect of users or providers providing more expensive care. (Hou, Poel, Doorslaer, Yu, & Meng, 2012)

On the contrary, few studies depict that CBHI has only been partially effective in improving access and reducing OOP. In China, the New Cooperative Medical scheme (NCMS) was launched to ease members' financial burden due to health care. A study done to evaluate the impact of the NCMS scheme in rural China found that the scheme was able to reduce the OOP expenditure at the outpatient level but contributed to the increase of inpatient service expenditures. A case control study from Mali conducted to study the impact of membership in four Mutual Health Organizations (MHOs) showed that there was reduced OOP expenditure among the insured for fever treatments only. Similarly, a study conducted in three West African countries of Ghana, Mali and Senegal showed decline in OOP among the insured for hospitalization only. In these countries, membership to prepayment schemes did not appear to have a significant effect on OOP expenditures for curative outpatient care as the expenses incurred were almost the same for members and non-members.

In the case of Ethiopia, although not a universal challenge there are anecdotal evidences from some schemes that due to low quality of health services at contracted facilities, non-availability of drugs in these facilities and the undesirable attitude of health professionals to the CBHI program, CBHI members were forced to make high OOP payments on top of their contributions.

2.8 CBHI Development in Ethiopia

Community based health insurance in Ethiopia was initiated and guided based on the 2008 health insurance strategy of the Federal Ministry of Health. The strategy identified three types of health insurance schemes that would supplement each other to provide financial protection to citizens. The three types of health insurance schemes identified in the strategy are;

(1) Social health insurance aiming to cover citizens engaged in the formal economic sector
(2) Community based health insurance that would cover citizens in the informal economic sector that constitute nearly 90% of the Ethiopian population
(3) Private health insurance that is available through commercial insurance companies aiming to provide extra benefit to citizens that can afford to pay the premium

While the first two are government sponsored insurance programs, the third type i.e. private health insurance is run by commercial companies that aim to profit out of the business.

As the focus of this study is CBHI, I would focus on the remainder of this section to account the development of CBHI in Ethiopia.

The 2008 health insurance strategy of the FMOH puts for an initial pilot implementation of CBHI and a gradual scale-up based on the findings of the pilot.

Pilot implementation of community based health insurance in Ethiopia was started in 2011 in 13 districts of four regional states with better implementation experience and capacity of first generation health financing reforms. The regions selected for the pilot implementation were Amhara, Oromia, southern Nations, Nationalities and Peoples (SNNP) and Tigray regions. The pilot was implemented by Abt Associates Inc. through the Health Sector Financing Reform (HSFR) Project of the United States Agency for International Development (USAID)

Prior to the launch of the pilot program, preparatory activities such as study tours to African, Asian and Latin American countries to learn from their experience, undertaking feasibility study to set contribution level and benefit package, designing of the pilot including development of monitoring and evaluation design, capacity building activities to health facilities and other actors in the pilot implementation and above all consultation and policy workshops with stakeholders in the perspective of their interests were carried out. Awareness creation and community mobilization activities were also carried out to sensitize the community about the program.

Four control Woredas that would be used to validate the differences that the CBHI program has brought were also selected each from the four intervention regions. After two years of implementation, an evaluation study was undertaken and overall results showed the program has positive contributions including the following:

- Health service utilization of CBHI beneficiaries increased more than two times from the national average utilization rate i.e. from 0.34 visits to 0.70 visits by CBHI beneficiaries.
- CBHI enhanced financial protection of its members. CBHI members were found less likely to be exposed to catastrophic health expenditures than non-members.
- CBHI enhanced social inclusion by allowing coverage of the poor through the allocation of targeted subsidies by local and regional governments. By 2013 nearly 7% of the eligible

households in the pilot districts were selected and enrolled to CBHI schemes as indigent members.

- CBHI contributed in improving quality of health services by increasing the resource flow to health facilities.

Encouraged by the findings of the pilot evaluation the government decided to scale-up the program to other districts and regions. A CBHI scale-up strategy and from it a CBHI scale-up directive were developed and endorsed in 2015 to support the full scale-up of the program country wide.

The Federal ministry of health also made CBHI as one core component of its five year Health sector Transformation plan (HSTP). During the pilot phase, design parameters such as contribution amount, unit of enrollment, benefit package, staffing etc. used to vary slightly from region to region. However, during the scale-up phase the government is working to harmonize the design features although there are still variations here and there.

The basic design parameters of the Ethiopian CBHI as outlined in the scale-up directive are described below.

Membership- membership to CBHI is on voluntary basis. However, local administrations use various administrative incentive and disincentive mechanism to increase uptake of the program by the community.

Source of Finance: The major Sources of Finance to the CBHI Program are contributions from the community, targeted subsidy by regional and local administrations for the poor and general subsidy by the federal government to the scheme. Contribution by members is 240 Birr per annum per household in rural settings and 350 birr per annum per household in urban settings. The contribution amount in big cities is Birr 500 per annum per household. The contribution amounts cover only core family members (husband, wife and children under 18). Extended family members can also be covered with payment of additional contribution.

The general subsidy from the federal government used to be 25% of total scheme resources during the pilot period but is now reduced to 10%.

Benefit Package: under the Ethiopian CBHI design, beneficiaries are entitled to access a package of basic curative health services both as an outpatient and inpatient from contracted health facilities. The beneficiaries have to start getting the service from health centers and can access hospital level services following the appropriate referral line. In case of bypassing the referral line, beneficiaries have to pay 50% by pass fee. The package covers consultation, laboratory, medicine, bed etc. expenses that are prescribed by health professionals. There are no co-payments and caps put on the benefit package.

Unit of Enrollment: The unit of enrollment to CBHI schemes is at household level and all core family members have to register with the scheme. This allows CBHI schemes to control risks of adverse selection. However, extended family members are enrolled with payment of additional contribution and there is no requirement to enroll all of the extended family members. This has a potential to select extended family members with frequent health problem and hence the problem of adverse selection would creep in.

Registration /Renewal Period: Registration to the CBHI program is open in most districts from December-March which is the harvest season for most districts. However, option is provided to districts to set the registration period to a different time of the year depending on their contexts i.e. to the period where the residents of the region earn most of their income. Fixing of the registration/renewal season to be once every year has helped the schemes to lower administrative costs on the one hand and to control adverse selection on the other.

Governance and Staffing: CBHI schemes have their own governing structures namely general assembly and Woreda CBHI Board. The general assembly is constituted from CBHI members representing the community and relevant government sector offices. It is the highest decision making organ of the CBHI schemes. CBHI schemes have also boards that are selected from the members of the general assembly. While the generally assembly meets once every year, the board is expected to meet quarterly to deliberate on various agenda items including review of performance of the scheme.

As to the staffing of the schemes, they are staffed with three full time employees. The office of the scheme used to be housed in the office of the district administration during the pilot program.

However, during the scale-up phase the office of the scheme is being organized under the district health office.

The CBHI schemes also get leadership and technical support from other government structures organized at Zonal and regional level and from the Ethiopian Health Insurance Agency. The relationship of the different actors and their key roles is shown in the following diagram.

Pooling: In the Ethiopian CBHI design, the pools are established at district level. The cross-subsidization so far is limited to be between residents of a particular district. The size of the pool fund varies from district to district depending on the number of households living in the district. On the average a particular district in Ethiopia has about 20,000 households with average family size of 4.8 persons per household. The CBHI directive has a provision which stated that CBHI Schemes would be launched when at least 50% of the eligible household subscribe to the scheme. This is introduced to protect the establishment of small size pools that may not be sustainable in the long-term.

Provider Payment Mechanism: Fee-for-service payment system was the provider payment mechanism that was used to reimburse health facilities during the pilot phase. However during expansion of the program, capitation (per capita) payment mechanism was introduced in some schemes with the objective of containing costs. However, the implementation of capitation was aborted during the scale-up phase and Fee-for-service payment mechanism was endorsed as an appropriate payment system for the Ethiopian context. The main reasons for an early termination of capitation were the limited risk that CBHI schemes face in terms of sustainability challenges due to low health service utilization by the rural community and the complaints of healthcare providers on the low per capita payment as result of small fund available for distribution. Currently, the payment mechanism that is used by CBHI schemes to reimburse health facilities is fee-for-service payment mechanism. In the case of Adea Woreda, the payment mechanism used to be capitation for the first 18 months and is now shifting to fee-for-service payment system. The fee level used for reimbursement is the standard fee of the health facilities that is also used for non-insured patients.
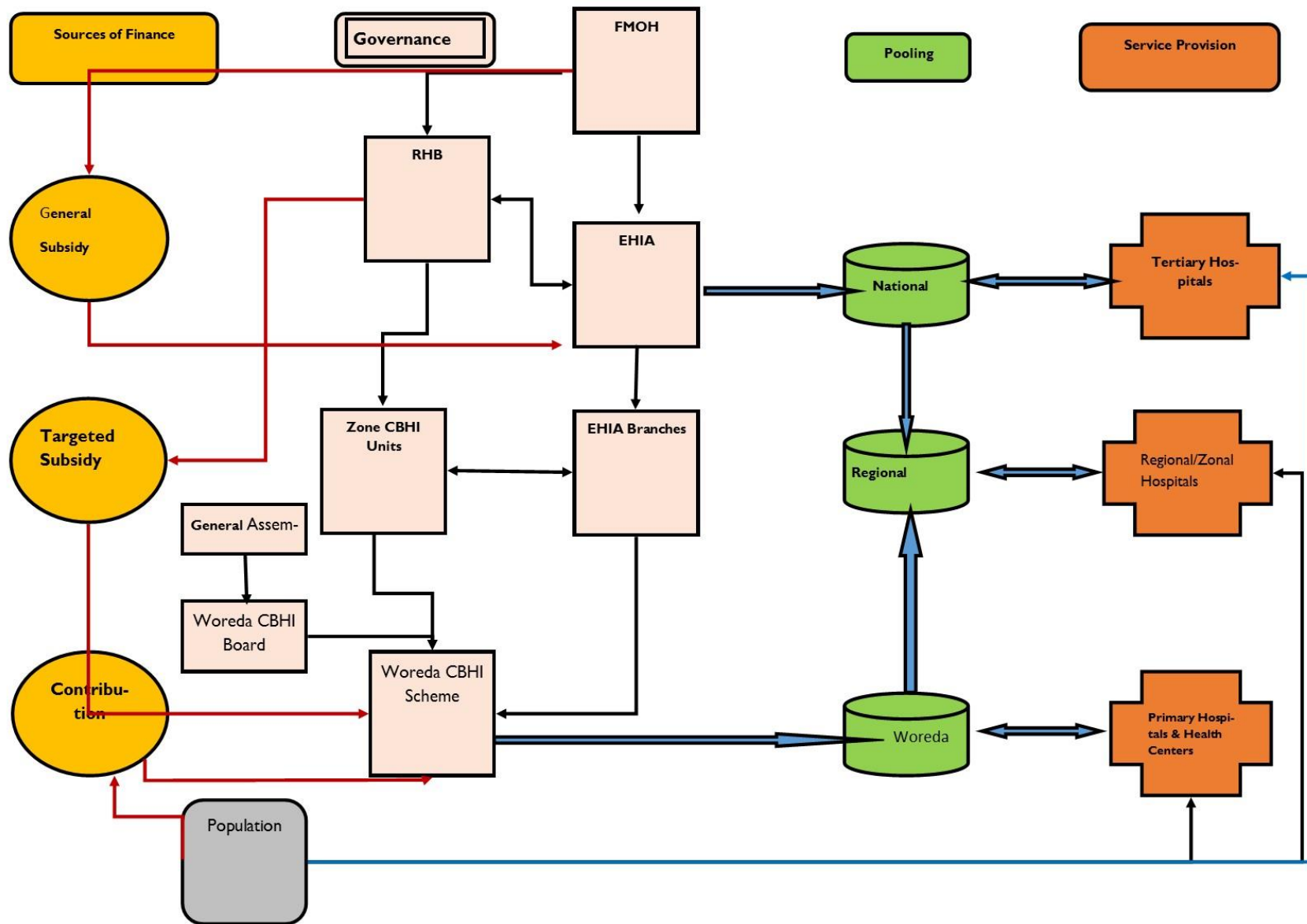
Figure 1: CBHI Structure: Sources of Finance, Pooling, Service provision and Governance, adapted from EHIA Scale-up

3   Methodology of the Study

This research uses both primary and secondary data sources in order to establish relationships essential for prediction of measurable outcomes. The study is a cross sectional study which is guided by facts witnessed through quantitative analysis of the data obtained during the survey period.

3.1 Study Setting

This study focuses on Adea CBHI scheme which covers the residents of Adea district. The district is found in Oromia regional state in East Shoa zone and is 42 Kms from Addis Ababa. The district has 27 Kebeles of which 22 are rural and 5 urban. The main economic activity of the residents of the district is agriculture with crop cultivation dominating. However there are also people employed in the surrounding industrial establishments and quarry mining sites. The total population of the district is 138,383. In terms of household size the district has 28,830 households out of which 25,947 households are eligible for CBHI membership. The scheme has so far registered 11,693 households as CBHI members making the enrollment ratio of the district 45%. The scheme has entered contractual agreement with 6 health centers, 2 hospitals and 2 drug outlets as providers of healthcare services for its beneficiaries. The scheme was established in 2015.

3.2 Data Sources and Data Collection

The primary data sources include data that have been collected through household survey, key informant interview and CBHI scheme routine data. Furthermore, secondary data sources such as previous works, government reports and other relevant literature have been used for the study.

Structured questionnaire to collect information from the households on their socioeconomic and demographic characteristics and health service utilization was developed. The data was collected through health extension workers after giving adequate orientation on the technical issues and contents of the instrument. Furthermore, interview questions that guided the discussion with key

informants at the scheme and district health office were developed and administered by the author himself.

3.3 Sampling Design and Procedure

3.3.1 Sampling Procedure

The study used two-stage sampling method to select the households for the study. At the first stage the Kebeles that were covered in the study were purposively selected based on accessibility. Next, the households that were covered by the survey were selected using systematic random sampling from a complete list of the residents of a Kebele. The CBHI scheme had the full list of households enrolled to the scheme by Kebele.

As the study addresses both insured and non-insured households of the district, the non-insured members that were selected for the survey are those households that are closest to the insured households included in the sample in terms of distance of their residential house.

3.3.2 Sample Size

The samle size for this study was determined in consideration of the 11693 CBHI enrolled households out of the total 25947 eligible households. Hence the sampling frame used for the study was the eligible household size for CBHI enrollment. Hence the sample size for the study that would be representative of the population is determined using the following formula.

$$n = \frac{Z^2 P(1-P)}{e2}$$

Where;

n= sample size

P = proportion of residents who are CBHI members

e= the margin of error which is set at 5% here

Z = which is 1.645 at confidence interval of 90%.

Hence the total number of respondents included in the survey is 266. However, to give some allowance for non-response I have adjusted the sample size upwards by 5% giving a sample size of 280. As per the design, out of the 280 total households that were selected for the survey, 126 were expected to be CBHI member households and the remaining 154 were expected to be non-member households. A total of 270 households i.e. 126 members and 144 non-members responded for the survey giving an overall response rate of 96.43%.

Regarding key informant interviews, the coordinator of the CBHI scheme was interviewed.

3.4 Data Analysis

The data collected for the study is analyzed using SPSS software version 20. Two models are used in this study to estimate first, the probability of access to basic health care services for the insured and uninsured population groups; and second, the incidence of catastrophic health expenditures between insured and uninsured households.

Model 1: Access to Modern Health Care System

In this model the relationship between CBHI membership and the use of health services at the individual level in the population who reported need is developed to see if there is any differential in health care utilization . The model will inform us if there is any difference in healthcare utilization intensity between CBHI members and non-members and the influence of the other covariates in healthcare utilization. In this context, utilization included outpatient and inpatient services, but excluded care provided exclusively at pharmacies. Logistic regression model with binary outcomes was used to model the main dependent variable i.e. utilization. The model takes the form

$$\ln \frac{p(use = 1)}{P(use = 0)} = Bx$$

In this model use=0 represents the base group of individuals who did not use any health services and use=1 is the group of individuals who used health services. X is a vector of explanatory variables and B is a vector of coefficients for X. The covariates considered include age, sex and education of the household head, household expenditure quintile, and household insurance status.

Model 2: Impact of Financial Protection

The second model that is applied in this study is again a binary model to estimate the likelihood of exposure of households to catastrophic health expenditure and through this the contribution of CBHI to financial protection of insured households. The model takes into account information on effective income, capacity to pay, and subsistence spending to determine the proportion of out-of-pocket (OOP) payment of the household out of its capacity to pay to estimate if the health expenditure is catastrophic or not. Effective income of the household is that income that is actually expended by the household on consumption and hence in this model the effective income is assumed to be same as the total consumption expenditure of the household. The subsistence spending of a household is all spending that is made by the household on food items. The capacity to pay of the household is therefore the ability of the household to expend on other consumption items after making food expenditures. Household financial burden will be measured by the out-of-pocket health expenditure (OOP) as a share of its capacity to pay (CTP), which is a household's non-subsistence spending. A logistic regression model will be used to explore the relationship between CBHI and the financial burden of households. The dependent variable in the regression will be household financial burden (OOP/CTP). The covariates to be considered include: sex of the household head, whether the household had members less than 5 years of age, education status of the household head, household size, and household expenditure quintile. The model as narrated above can be represented mathematically as follows.

Let;

- Capacity to pay of household (CTP), be defined as effective income minus subsistence expenditures i.e. the income that is spent by the household for consumption,
- Effective income of household (EI) be estimated by household consumption expenditure,
- Subsistence expenditure of household (SE) is estimated by household food expenditure.

Hence CTP = EI - SE

Using information on household health related out-of-pocket expenditures (OOP) that is available from the survey it is now possible to determine the incidence of health-related out-of-pocket expenditures on households by taking the ratio of OOP to capacity to pay of the household (ROOPCTP). This ratio can be mathematically represented as

ROOPCTP = OOP / CTP = OOP / (EI - SE)

Using the lower threshold limit of 15% to indicate the occurrence of catastrophic health expenditures in the household for low income countries, the incidence of catastrophic expenditure (ICE) on the household is defined as follows:

ICE = 0 if R_h < 15%

ICE = 1 if R_h ≥ 15% and

Where R_h is ROOPCTP

The logit model used is hence represented as

$$\ln\frac{p(ICE = 1)}{P(ICE = 0)} = Bx$$

Where x is a vector of covariates described above and b is a vector of coefficients for the X covariates and the main independent variable i.e. membership to CBHI schemes.

3.5 Variables
3.5.1   Outcome variables:

The main outcome variables in this study are access & utilization of health care services and out-of-pocket household expenditure for health. Information on access and utilization were obtained from the HH survey with reference to their response on their visits of past four weeks for outpatient department (OPD) and their admission in the past 12 months for inpatient department (IPD) prior to the interview. The information for the variable out-of-pocket household expenditure was obtained from the responses of the households for the OPD and IPD services received in the past four weeks and past 12 months respectively. In both cases the four weeks recall period and past 12 months recall period were the times just before the interview date.

3.5.2   Main independent variable:

The main independent variable under this study is membership to community-based health

insurance. The study aims to assess the contribution of community health insurance scheme in improving access & utilization of healthcare service primarily and its contribution in the reduction of catastrophic health expenditure as a related variable. This is a binary variable indicating whether the household was enrolled in CBHI or not.

3.5.3 Covariates:

Socio-demographic variables including the head of household's gender, age, educational attainment, marital status, household size; health related variables such as self-assessment of health status and chronic disease condition, and variables on household consumption expenditure are the covariates considered in the study.

4 Results and Discussion

This chapter contains the result of the logistic regression on data collected from the sampled households. The results obtained are also analyzed for their implication and interpretation in the discussions section.

4.1 Results

4.1.1 Household Characteristics

The survey covered 270 households in Adea district of which 127 households are members of the district's CBHI scheme and 143 are nonmembers. The distribution of households based on their CBHI membership and selected socioeconomic and demographic variables are shown in the following table.

Table 2: Characteristics of Household covered in the survey based on their uptake of the CBHI program

Place of Residence

			Household Covered Under CBHI	
			No	Yes
Place of Residence	Urban	Count	22	32
		%	40.7%	59.3%
	Rural	Count	121	95
		%	56.0%	44.0%

Family Size Groups

			Household Covered Under CBHI	
			No	Yes
Family Size Groups	1-5	Count	85	80
		%	51.5%	48.5%
	6-10	Count	51	47
		%	52.0%	48.0%
	>10	Count	7	0
		%	100.0%	0.0%

Sex of Household Head

			Household Covered Under CBHI	
			No	Yes
Sex of Household Head	Male	Count	120	107
		%	52.9%	47.1%
	Female	Count	23	20
		%	53.5%	46.5%

Age Groups

			Household Covered Under CBHI	
			No	Yes
Age groups	15-24	Count	3	1
		%	75.0%	25.0%
	25-34	Count	21	11
		%	65.6%	34.4%
	35-44	Count	59	49
		%	54.6%	45.4%
	45-54	Count	37	27
		%	57.8%	42.2%
	55-64	Count	17	27
		%	38.6%	61.4%
	>65	Count	6	12
		%	33.3%	66.7%

Literacy

			Household Covered Under CBHI	
			No	Yes
Ever been to school	No	Count	49	40
		%	55.1%	44.9%
	Yes	Count	94	87
		%	51.9%	48.1%

Marital Status of HH Head

			Household Covered Under CBHI	
			No	Yes
Marital Status of HH Head	Never married	Count	10	3
		%	76.9%	23.1%
	Married	Count	122	117
		%	51.0%	49.0%
	Divorced	Count	6	4
		%	60.0%	40.0%
	Widowed	Count	5	3
		%	62.5%	37.5%

Self-rating of Health Status Compared with Others of Same Age

			Household Covered Under CBHI	
			No	Yes
Self-rating of Health Status compared with others of same age	Very good	Count	40	39
		%	50.6%	49.4%
	Good	Count	52	37
		%	58.4%	41.6%
	Moderate	Count	48	43
		%	52.7%	47.3%
	Bad	Count	3	5
		%	37.5%	62.5%
	Very bad	Count	0	3
		%	0.0%	100.0%

Presence of a Chronic Illness in the Family Members

			Household Covered Under CBHI	
			No	Yes
Presence of a chronic Illness in the family members	No	Count	93	68
		%	57.8%	42.2%
	Yes	Count	50	59
		%	45.9%	54.1%

Quintile Grouping Based on Per Capita Household Consumption Expenditure

			Household Covered Under CBHI	
			No	Yes
Quintile Grouping Based on Per Capita Household Consumption Expenditure	1st Quintile	Count	34	20
		%	63.0%	37.0%
	2nd Quintile	Count	29	26
		%	52.7%	47.3%
	3rd Quintile	Count	31	22
		%	58.5%	41.5%
	4th Quintile	Count	26	27
		%	49.1%	50.9%
	5th quintile	Count	23	32
		%	41.8%	58.2%

Out of the total eligible population for CBHI membership in the district 80 % live in rural areas and 20% live in towns. The proportion of households residing in towns who have become members of the CBHI scheme is about 59.3% while this proportion in rural households is about 44%.

The proportion of female and male headed households enrolled to the CBHI schemes seems to be balanced with the enrollment rate being 47.1% for female headed household and 46.5% for male headed households.

The proportion of households to join CBHI schemes increases with age of the household head. Households headed by young household heads are not enrolling to the CBHI scheme in the same proportion as households with older household heads. As can be seen from the table, while only a quarter of the households headed by people in the age group of 15-24 and close to one third of the households headed by people in the age group of 25-34 have joined the CBHI scheme, the proportion is higher in the other age group categories. For example, more than two third of the households headed by people aged 66 and over have joined the CBHI schemes. Likewise more than 61% of households headed by people in the age group of 55-64 have joined the CBHI scheme.

Out of the total households covered in the survey, the majority i.e. 239 households representing 88.5% of the population were married. In terms of membership to the CBHI scheme a greater proportion of the members are married than non-members i.e. 92% of the insured households were married while the proportion in the non-insured category was 85%.

Literacy of the household head is another variable considered in this study. The proportion of households who are literate and joined the CBHI scheme is 48.1%. The proportion of households who are illiterate and who joined the CBHI scheme is 45%, a very small difference with the literate households.

In terms of self-rating of health status, 168 i.e. 60% of the households said that they would rate their health status to be either good or very good as compared to the health status of individuals in the same age group. The other 40% of the households surveyed rate their health status to be either moderate or bad or very bad as compared to people of their age category. In terms of membership to the CBHI scheme 40% of the households who rated their health status as good

or very good have joined the CBHI scheme while the proportion of household who joined the scheme with health condition rating of moderate, bad or very bad is 50%.

It can also be observed that the proportion of households with a family member having a chronic health condition is higher than households with no family member having a chronic health condition i.e. 54.1% of household with a chronic health condition in their family member have joined the scheme while the proportion is 42% in households with no chronic condition in their family members.

The distribution of CBHI membership across different household size bands seem to be uniform. However, from the households who joined the CBHI schemes, the significant proportion are families with household size of 1-5. This might be due to the limitation of the entitlement to enroll as a beneficiary in the scheme as the basic contribution is to core family members only.

Finally, in terms of expenditure quintile, the proportion of households who joined the CBHI scheme is slightly higher in the high quintiles i.e. 51% for 4th quintile and 58.2% for 5th quintile. The proportion is smaller in the lower expenditure quintiles i.e. 41.5 % for 3rd quintile, 47.3% for 2nd quintile and 37% for 1st quintile.

4.1.2 Access to and Utilization of Healthcare Services

A total of 186 households (69%) believe that CBHI improves access to modern healthcare services. Out of this group of households who have the opinion that CBHI improves healthcare access 114 (61.3%) have already joined the CBHI scheme. On the other hand from the households who do not believe in the potential of CBHI to improve healthcare access only 12 households (14.3%) have joined the CBHI scheme.

As to the potential of CBHI in making healthcare services more affordable, 198 households (73.3%) believe that CBHI has that potential of making health services more affordable. Out of this group 122 (61.6%) of the households are already enrolled with the CBHI scheme. On the other hand 72 households do not believe in CBHI's potential to make healthcare services more affordable and only 4 households (5.6%) of these households are enrolled with the CBHI scheme. The following table shows the enrollment rate of households to the CBHI schemes and their

beliefs in the potential of CBHI in improving access to modern healthcare and in making healthcare services more affordable.

Table 3: Belief of Households on the Potential of CBHI to Improve Access to Modern Healthcare and Make Health Services Affordable

			Household Covered Under Health Insurance	
			No	Yes
Do you believe that CBHI improves access to health care?	Yes	Count	72	114
		% within Do you believe that CBHI improves access to health care?	38.7%	61.3%
	No	Count	72	12
		% within Do you believe that CBHI improves access to health care?	85.7%	14.3%
Total		Count	144	126
		% within Do you believe that CBHI improves access to health care?	53.3%	46.7%
Do you think CBHI has made health care more affordable?	Yes	Count	76	122
		% within Do you think CBHI has made health care more affordable?	38.4%	61.6%
	No	Count	68	4
		% within Do you think CBHI has made health care more affordable?	94.4%	5.6%
Total		Count	144	126
		% within Do you think CBHI has made health care more affordable?	53.3%	46.7%

Another important dimension to look at is the proportion of OPD visits and IPD admission between CBHI member and non-member households. The following table shows the frequency of OPD visits and IPD admission between the two set of households.

Table 4: OPD Visits and IPD Admissions of Households

			Household Covered Under Health Insurance	
			No	Yes
OPD visits by Households	No	Count	84	57
		% within OPD visits by Households	59.6%	40.4%
	Yes	Count	59	70
		% within OPD visits by Households	45.7%	54.3%
IPD Admission of the Households	No	Count	115	106
		% within IPD Admission of the Households	52.0%	48.0%
	Yes	Count	28	21
		% within IPD Admission of the Households	57.1%	42.9%

As shown in the above table out of the total number of households who have had OPD visits in the last 4 weeks 54.3% were CBHI members. In the case of admissions the proportion is reversed. Out of the total 49 households who had a family members admitted in the last 12 months prior to this survey the proportion of CBHI members was 21 households i.e. 42.9% while the nonmembers take the remaining 57.1% of the admissions i.e. 28 households.

Regarding the effect of the primary independent variable of interest i.e. membership to a community based health insurance scheme, the hypothesis is that after controlling for covariates such as individual, household economic and demographic characteristics, and community characteristics members of a CBHI scheme have better access. A logistic regression analysis was

conducted to predict the impact of CBHI coverage on the incidence of consultation. The results of the logistic regression run confirmed the hypothesis. The base line model which does not include the effect of the explanatory variables indicates that the model classified 53% of the time that households did not consult modern healthcare providers when falling sick. With the new model where the explanatory variables are included the model can classify cases correctly 68% of the time which is some improvement from the baseline. (Table 5: Classification tables)

The new model with explanatory variables included seems to explain more of the variance in the outcome variable i.e. consultation to modern health care provider. *(Chi-Square= 52.028, df=18, p=000).*

The model is also found to be a good fit to the data since the p value in the Hosmer and Lemeshow test is .240 which is greater than .05 as shown in the model summary table below.

The variables in the equation table of the logistic regression result shows the effect of the explanatory variables on utilization of health services. As can be observed from the following table membership to the CBHI scheme has a positive coefficient for utilization of health services confirming the hypothesis *(Wald=10.6555, df=1, p<.001).*

The odds ratio shows that, when falling sick, households with CBHI coverage are 2.533 times more likely to use modern healthcare services than non-member households. The effect of other covariates on the variations in the utilization of modern healthcare by households was found to be not significant *(p> 0.05).*

Table 5: Logistic Regression Results Tables- Utilization of Modern Healthcare Services

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted		
			Consultation to modern health provider		Percentage Correct
			No	Yes	
Step 0	Consultation to modern health provider	No	143	0	100.0
		Yes	127	0	.0
	Overall Percentage				53.0

a. Constant is included in the model.

b. The cut value is .500

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	52.028	18	.000
	Block	52.028	18	.000
	Model	52.028	18	.000

Model Summary

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.367	8	.240

Classification Table[a]

Observed			Predicted		
			Consultation to modern health provider		Percentage Correct
			No	Yes	
Step 1	Consultation to modern health provider	No	107	36	74.8
		Yes	48	79	62.2
	Overall Percentage				68.9

a. The cut value is .500

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		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Variables in the Equation									
Step 1[a]	Place_Residence(1)	.988	.397	6.177	1	.013	2.685	1.232	5.851
	SexHH_Head(1)	-.496	.411	1.456	1	.228	.609	.272	1.363
	Age	.008	.012	.474	1	.491	1.008	.985	1.032
	Schooling(1)	.282	.319	.779	1	.377	1.326	.709	2.479
	Marital_Status			4.179	3	.243			
	Marital_Status(1)	-.783	.671	1.364	1	.243	.457	.123	1.701
	Marital_Status(2)	-2.022	1.096	3.404	1	.065	.132	.015	1.134
	Marital_Status(3)	-1.655	1.110	2.222	1	.136	.191	.022	1.684
	Health_Status			3.757	4	.440			
	Health_Status(1)	-.140	.356	.154	1	.695	.870	.433	1.746
	Health_Status(2)	.082	.362	.052	1	.820	1.086	.534	2.208
	Health_Status(3)	2.067	1.179	3.076	1	.079	7.903	.784	79.640
	Health_Status(4)	20.240	23022.994	.000	1	.999	617019620.530	.000	.
	CHRONIC_CONDBIVARIATE(1)	.334	.302	1.224	1	.269	1.396	.773	2.521
	CBHI_Coverage(1)	.929	.285	10.655	1	.001	2.533	1.450	4.425
	Quintile_Group_PerCapita			6.615	4	.158			
	Quintile_Group_PerCapita(1)	-1.236	.487	6.446	1	.011	.290	.112	.754
	Quintile_Group_PerCapita(2)	-.647	.469	1.899	1	.168	.524	.209	1.314
Step 1[a]	Quintile_Group_PerCapita(3)	-.627	.460	1.855	1	.173	.534	.217	1.317
	Quintile_Group_PerCapita(4)	-.735	.449	2.675	1	.102	.480	.199	1.157
	Family_Size	.193	.080	5.749	1	.016	1.213	1.036	1.420
	Constant	-1.491	.947	2.480	1	.115	.225		

a. Variable(s) entered on step 1: Place_Residence, SexHH_Head, Age, Schooling, Marital_Status, Health_Status, CHRONIC_CONDBIVARIATE, CBHI_Coverage, Quintile_Group_PerCapita, Family_Size.

4.1.3 Protection from Catastrophic Health Expenditure

On the basis of the catastrophic threshold of 15% of CTP, 17 i.e. 6.3% households were estimated to have incurred catastrophic health expenditures out of the total 270 households covered in the survey. All of the households that have incurred catastrophic health expenditures were not members of the CBHI scheme in the district.

Table 6: Incidence of Catastrophic Health Expenditure

			Household Covered Under Health Insurance	
			No	Yes
Incidence of Catastrophic Health Expenditure	No	Count	126	127
		% within Household Covered Under Health Insurance	88.1%	100.0%
	Yes	Count	17	0
		% within Household Covered Under Health Insurance	11.9%	0.0%
Total		Count	143	127
		% within Household Covered Under Health Insurance	100.0%	100.0%

The most important concern here is to see the effect of the primary independent variable of interest i.e. membership to a community based health insurance scheme, on the incidence of catastrophic health expenditures. The hypothesis here is that after controlling for covariates such members of the CBHI scheme are less likely to face catastrophic health expenditures. A logistic regression analysis was conducted here also to predict the impact of CBHI coverage on the incidence of catastrophic health expenditure on households after defining catastrophic health

expenditures as that level of health expenditures exceeding 15% of the capacity to pay of households. The results of the logistic regression run confirmed the hypothesis.

The base line model which does not include the effect of the explanatory variables shows that 85.9% of the time households did not face catastrophic health expenditures. With the new model where the explanatory variables are included in the equation the predication has been a little bit improved to 87.8% of the time as can be seen from the classification table.

As can be verified from the Omnibus test of model coefficients, the new model with explanatory variables included explains more of the variance in the outcome variable i.e. incidence of catastrophic health expenditure. *(Chi-Square= 45.877, df=18, p=000).*

The Hosmer and Lemeshow goodness of fit test also verified that the model is a good fit to the data since as the p value is .996 which is very much greater than .05. (Table Hosmer and Lemeshow)

Table 7, the logistic regression results table, shows the effect of the explanatory variables on incidence of catastrophic health expenditures. As can be observed from the table membership to the CBHI scheme has strong association on the likelihood of a household to incur catastrophic health expenditure. The B value has a negative coefficient which shows that CBHI members are less likely to incur catastrophic health expenditures as compared to the reference group of non-member households. *(Wald=7.889, df=1, p<.005).* The odds ratio shows that, CBHI member households were 0.271 times less likely to use modern healthcare services than non-member households. The effect of other covariates on the variations in the utilization of modern healthcare by households was found to be not significant *(p> 0.05)* except per capita consumption expenditure where households in the low income quintiles were found to have incurred catastrophic health expenditures than households in 3rd, 4th and 5th expenditure quintiles. *(Wald=12.401, df=4, p<.015).* The odds ratios also show that controlling for other variables, households in the 3rd, 4th and 5th quintile are less likely to incur catastrophic health expenditures. (Refer Logistic regression results table- variables in the equation table)

Table 7: Logistic Regression Results- Incidence of Catastrophic Health Expenditure
Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted		
			Incidence of Catastrophic Health Expenditure		Percentage Correct
			No	Yes	
Step 0	Incidence of Catastrophic Health Expenditure	No	232	0	100.0
		Yes	38	0	.0
	Overall Percentage				85.9

a. Constant is included in the model.
b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.809	.175	106.870	1	.000	.164

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	45.877	18	.000
	Block	45.877	18	.000
	Model	45.877	18	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	173.528[a]	.156	.281

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	1.299	8	.996

Classification Table[a]

Observed			Predicted		
			Incedence of Catastrophic Health Expenditure		Percentage Correct
			No	Yes	
Step 1	Incidence of Catastrophic Health Expenditure	No	229	3	98.7
		Yes	30	8	21.1
	Overall Percentage				87.8

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1ª	Place_Residence(1)	2.348	1.083	4.703	1	.030	10.465	1.253	87.373
	Family_Size	-.095	.114	.702	1	.402	.909	.727	1.136
	SexHH_Head(1)	-.007	.635	.000	1	.991	.993	.286	3.443
	Age	.012	.020	.356	1	.551	1.012	.974	1.051
	Schooling(1)	.609	.465	1.716	1	.190	1.838	.739	4.570
	Marital_Status			5.260	3	.154			
	Marital_Status(1)	-1.570	.727	4.660	1	.031	.208	.050	.865
	Marital_Status(2)	-2.117	1.360	2.422	1	.120	.120	.008	1.732
	Marital_Status(3)	-1.464	1.342	1.191	1	.275	.231	.017	3.208
	Health_Status			.796	4	.939			
	Health_Status(1)	-.137	.534	.066	1	.798	.872	.306	2.482
	Health_Status(2)	.125	.553	.051	1	.821	1.133	.383	3.353
	Health_Status(3)	.773	1.201	.415	1	.520	2.167	.206	22.815
	Health_Status(4)	-19.169	22614.606	.000	1	.999	.000	.000	.
	CHRONIC_CONDBIVARIATE(1)	.406	.448	.821	1	.365	1.500	.624	3.608
	CBHI_Coverage(1)	-1.304	.464	7.889	1	.005	.271	.109	.674
	Quintile_Group_PerCapita			12.401	4	.015			
	Quintile_Group_PerCapita(1)	1.001	.641	2.437	1	.118	2.721	.774	9.557
	Quintile_Group_PerCapita(2)	-.416	.689	.364	1	.546	.660	.171	2.547
	Quintile_Group_PerCapita(3)	-1.232	.793	2.416	1	.120	.292	.062	1.379
	Quintile_Group_PerCapita(4)	-.629	.714	.777	1	.378	.533	.131	2.161
	Constant	-2.528	1.604	2.484	1	.115	.080		

a. Variable(s) entered on step 1: Place_Residence, Family_Size, SexHH_Head, Age, Schooling, Marital_Status, Health_Status, CHRONIC_CONDBIVARIATE, CBHI_Coverage, Quintile_Group_PerCapita.

4.2 Discussion

4.2.1 Insurance Coverage and Access to Modern Healthcare services

The logistic regression run showed that controlling for other variables households with CBHI coverage tend to utilize health services more than households that are not enrolled to the CBHI schemes. As indicated in the variables in the equation table of the logistic regression results, CBHI coverage has a positive B coefficient meaning that having health insurance cover contributes to increased access in modem healthcare. Furthermore the odds ratio indicates that insured households were about 2.533 times more likely to utilize health care services than households without health insurance coverage. This finding is consistent with the results of the Ethiopian CBHI pilot evaluation which asserted through data obtained from key informant interviews (KII) and focus group discussion (FGD) that households with CBHI coverage utilize health services than nonmembers due to removal of financial barriers and the various awareness creation programs of the CBHI schemes. It is also in agreement with many other empirical evidences conducted on the impact of health insurance in improving health service utilization (A. Mebratie et al. 2015; Hounton, Byass, & Kouyate, 2012; Acharya, et al., 2012).

The benefit package of Adea CBHI schemes can be considered to be comprehensive. It includes both outpatient and inpatient services, laboratory services, imaging and x-ray services, and drugs. Prior to the launch of the scheme a facility readiness assessment has been conducted by the regional health bureau and major gaps that would affect the delivery of quality health service were filled. This might have contributed in building the confidence of the households on the capacity of the health facilities to provide effective quality of care and hence decide to visit the facilities whenever they fall sick. CBHI beneficiaries are able to get the required services from the contracted facilities.

Abdu Redi, coordinator of Adea CBHI scheme, believes that CBHI is increasing health services utilization of the local community. He sees an increasing trend in the number of visits and admissions and an increase in the amount of reimbursement requests that the contracted health facilities make every quarter. He supports his claim with quantitative data from the CBHI scheme. Abdu says, "for example In 2016/17 the total number of CBHI beneficiaries OPD visits was 14431

and the total IPD admissions were 43 which was a big jump from the 2015/16 OPD visits of 2321 and IPD admission of just 6".

Another contributing factor for the increased health service utilization of CBHI member households could be the contractual arrangement that the scheme has made with private and community pharmacies to mitigate problems of drug stock out in contracted health centers. The scheme has also an agreement with two referral hospitals to enable CBHI beneficiaries access higher level health facilities without any financial hardship. However as shown in table 4 households who are not members of the CBHI scheme are accessing hospital level services in more proportions than households with CBHI coverage. The reason for this low utilization of hospital level services by CBHI member households might be the strict requirement put upon CBHI members to respect the referral line. The provisions of the CBHI directive states that the first point of service for a CBHI beneficiary is the health center and the member could go for higher level healthcare service following the referral line. If a CBHI member households bypasses the referral line it would be forced to pay 50% of the total service cost as a bypass fee.

There are also some other factors that might have affected the health service utilization of CBHI member household on the negative side. One of the important factors that could be mentioned here is the inability of the scheme to distribute identification cards to all registered members. Data collected from the CBHI scheme during this study show that out of the 12349 households registered with the CBHI scheme 26.70% did not get their CBHI ID cards. This group of households might have needed healthcare service but might have decided not to use healthcare services or might have incurred OOP in addition to the contributions they paid for membership to the scheme.

Another limiting factor that has been mentioned by households is the restriction of the insurance cover at the basic contribution to core family members only. This is considered a serious limitation in families with extended family members since they have to pay extra amounts to get those family members covered in the scheme. From the household survey data it was found out that only 54% i.e. 69 households out of the 126 CBHI member households had all their family members covered in the insurance. This means that all members of the households unit are not accessing healthcare through the CBHI system.

Households were asked the type of healthcare provider they have visited and 96.72% i.e. 59 CBHI households out of the 61 households who needed curative care visited government facilities while 63.79% i.e. 37 households out of the 58 non CBHI member households who needed care visited government facilities the rest visiting Private and NGO/faith based healthcare providers. As this might affect CBHI uptake the district CBHI scheme has to arrange contract arrangements with faith based providers which are usually not expensive and has also to work with relevant authorities to improve quality of health services at government health facilities.

In general, the conclusion we can make here is that financial accessibility is one of the most important barriers to access to health care for the poor. The Adea Community-Based Health Insurance scheme is thus providing some form of financial protection and hence improving access to medical care for its members.

4.2.2 Insurance Coverage and Protection against Catastrophic Expenditure

The second objective of this study is to explore the protection that CBHI coverage provides to households from incurring catastrophic health expenditures. There are numerous evidences on the potential of CBHI schemes in protecting households from catastrophic health expenditures. The findings under this study are also in line with the empirical evidence on the protective effect of CBHI schemes from catastrophic health expenditures. The results of the logistic regressions show that CBHI coverage has a negative B coefficient which indicates that, other things remaining the same, households with CBHI coverage have less chance of being exposed to catastrophic health expenditures. The odds ratio also shows that households with CBHI coverage are .271 times less likely to be exposed to catastrophic health expenditures. (Table 7). These findings are consistent with the evaluation study of pilot CBHI schemes where it was found that the risk of exposure was less by 26.9 percentage points than non-member households. A study carried out by Michael Kent Ranson in Gujarat, India also showed that CBHI schemes reduced catastrophic health expenditure from 35% (uninsured) to 15% (insured) and concluded that CBHI undeniably provided some financial protection to claimants (Ranson, 2002).

The head count oh households facing catastrophic health expenditure from the sample selected for this study shows that none of the households with CBHI coverage had faced the risk of catastrophic health expenditure. Only 17 households representing 6.30% of the total who all are

with no CBHI coverage had faced catastrophic health expenditures. The potential reason for not getting CBHI member households with catastrophic health expenditures include the comparatively wider benefit package of the CBHI scheme which reduced the need for payment of out-of-pocket payments, the contractual arrangement that Adea CBHI scheme has entered with community and private pharmacies which reduced the possibility of incurring OOP payments by CBHI beneficiaries whenever services are not available at public facilities, the coverage given to poor households through targeted subsidy of local and regional administrations which otherwise might have increased the number of households with catastrophic health expenditures.

As far as the non-insured households are concerned the reasons for the low number of households that faced catastrophic health expenditures could be the highly subsidized user fee of public facilities. 72 households from the total of 270 i.e. 26.67% of households do not believe that CBHI would make health services more affordable. In fact they have expressed their concerns that CBHI contributions would become double payments in case of non-availability of drugs at contracted health facilities. In addition CBHI member households with no CBHI ID cards yet would be forced to pay OOP in case of sickness since they cannot access health service through the CBHI scheme. This problem is compounded for indigent CBHI households who have not yet received their CBHI membership cards. The quantitative information obtained indicates that 11.5% of the indigent CBHI member households i.e. 301 households out of the total 2609 households selected as indigent members, have not yet obtained their CBHI ID cards.

The household survey data collected for this study confirms that being covered by the CBHI scheme did not fully remove OOP payments. Out of the total 127 CBHI member households who were covered by the study 15 households i.e. 11.81% have said that they have paid OOP payments while holding CBHI cards. These payments are over and above the prepayment contributions that they made to the CBHI scheme. Fortunately, the OOP payments that these households have made were not catastrophic. (Table 8)

Table 8: CBHI Member Households who Paid OOP at point of Service

	Household Paid OOP		
	Yes	No	Total
Count	15	111	126
%	12%	88%	

A discussion with the CBHI scheme coordinator on the reasons why CBHI member households incur OOP payments identified the following factors. The first factor is the situation where the CBHI member households go to health facilities without their CBHI cards. Another factor is the situation where beneficiaries sometimes make payments without informing to the health facilities that they are members of the CBHI scheme. In such circumstances, payments that are made by the household until the time that their membership is discovered and proved of being a member of the CBHI scheme are accounted to the household since there are no arrangements to make refunds either by the facility or the CBHI scheme to the member. Lastly, the failure of the scheme to issue ID cards to all of its registered members is another reason leading households to incur OOP payments for healthcare.

5 Conclusion and Recommendations

5.1 Conclusion

Consistent with many other studies, this study has contributed to the CBHI body of knowledge by establishing that Community-Based Health Insurance schemes improve access of poor households to modern health care services and provide effective protection against catastrophic health expenditures. The following conclusions are drawn from the findings of this study.

The Adea CBHI scheme in particular and Community-Based Health Insurance in general contributes for the increase in health service utilization. It is established in this study that CBHI member households in Adea Woreda are more likely to use health care services than non CBHI member households in the same Woreda.

Members of Adea CBHI scheme were provided effective protection against catastrophic health expenditure. Based on the results of this study it was found that CBHI member households are less likely to experience catastrophic health expenditure than non CBHI member households.

5.2 Recommendations

Adea CBHI scheme is relatively a new scheme that has been in operation for three years. The findings of this study revealed that the scheme is improving access to modern healthcare and providing effective protection against catastrophic health expenditures. The efforts of the scheme and the local administration to increase enrollment are important to insure the cross subsidization between all residents of the district. Furthermore the routine supervisions that the scheme office makes on contracted health facilities are vital to improve quality of health services and reduce complaints. This would in turn increase the utilization of health services by the community. The contractual agreement that the scheme had entered with community and private pharmacies is also essential since it would reduce the possibility of having to pay OOP whenever some services are not available at public facilities.

The positive contributions of Adea CBHI scheme in enhancing modern healthcare utilization and providing financial protection have to sustain which demands action on the following issues.

Ensure Universal Enrollment of Eligible Households in the Woreda: The principle of insurance operation rest on the law of large numbers. The principle of risk pooling requires large membership size to guarantee adequate financial resources for the purchase of health services. Currently the CBHI scheme has an enrollment ratio of only 45%. Non Insured households were asked their opinion if CBHI members access health service better than they do. The majority of them i.e. 87 out of the 144 non CBHI members households (60.41%) believe that CBHI enables insured households to access health service more than non-insured households. Hence if appropriate community mobilization works are undertaken by the scheme and the local authorities there is the potential to increase the enrollment rate and increase the pool size which is essential to have a sustainable scheme.

Create Community Wide Consensus on the Bylaws & Work for Universal Enrollment of the Household Unit: Like in many parts in Ethiopia, the household unit in Adea is constituted by the core family and extended family members. The current membership policy of the CBHI scheme is that extended family members would not be covered in the insurance system on the lump sum contribution that the household paid. Additional contributions are required for family members outside the core family. Out of the 127 CBHI members households covered in this survey 44.9% have said that they have family members who are left out of the insurance. If illness happens to one of the family members that are not included in the cover the household has to bear all the responsibility of paying the costs of healthcare. As a result the scheme is not providing full financial protection to the household. A clear modality that would not affect the schemes funds and at the same time allow participation of extended family members has to be in place. One possible alternative is to make the enrollment unit at household level with payment of prorated contributions for the extended family members who have resided with the family for a reasonably longer period of time. This would give the scheme the chance to protect the partial adverse selection that might have happened now due to the policy of the scheme to enroll extended family members on individual basis.

Distribute ID Cards to All Registered Members: There are some households that are registered with the scheme and that have not yet obtained their CBHI ID cards. This means that CBHI members would not access health services when falling sick or they might be forced to cover the costs OOP at the point of care. In both cases the principal objectives of the program

i.e. improving access and providing financial protection are hampered seriously. The CBHI scheme office and the local authorities should understand that the community would consider the schemes as mere resource mobilization instruments if it is not getting the promised services. Hence mechanism to produce and distribute ID cards immediately when households register should be designed and put in place in the scheme.

Improve Healthcare Service Quality to Reduce Bypasses: CBHI beneficiaries sometimes decide to bypass the referral line so as to get quality health services from hospitals. This decision of households of course forces them to incur OOP which is equivalent to 50% of the total cost of services consumed at hospitals. The major driver for bypassing the referral line is the attitude that beneficiaries have formed on lower health facilities (health centers). People tend to consider treatments obtained at hospital level to be more effective than treatments provided at health center level. However, if problems in the drug supply and availability of key professionals is resolved in the health centers the households might prefer to follow the referral line to bypassing the system which exposes them to risk of potential catastrophic health expenditure. A related issue here is to make the public facilities self-contained where they would be able to provide all the required services within the premises of the health facility. This would reduce the discomfort the CBHI beneficiaries would face and influence the members to make the required visits whenever they feel sick.

More Community Sensitization & Awareness Creation Work: CBHI member households are reported to have incurred OOP payments due to failure to show their ID cards at the health facilities or since they go to the health facilities without holding their ID cards. The CBHI scheme should do more awareness creation on the need to hold their ID cards whenever they go to health facilities.

Initial Probe at Card Rooms Whether the Patient is a CBHI Member or Not: Health facilities should be advised to probe to their patients if they are members of the CBHI scheme or not. This can be standardized by including this procedure as a system in all points where patients need to make payments. This helps to reduce possibilities where CBHI member patients make OOP payments due to lack of information or confusion.

Finally, further studies on the performance of CBHI schemes in general should be conducted for more evidence on the impact of the program in improving healthcare service utilization and enhancing financial protection and to streamline some design, operational and administrative challenges so that the schemes would be sustainable.

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