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Sustainability of A Community-Based Health Insurance Scheme and Underlying Challenges in two Districts of Northeast Ethiopia

: Mohammed, Hussien

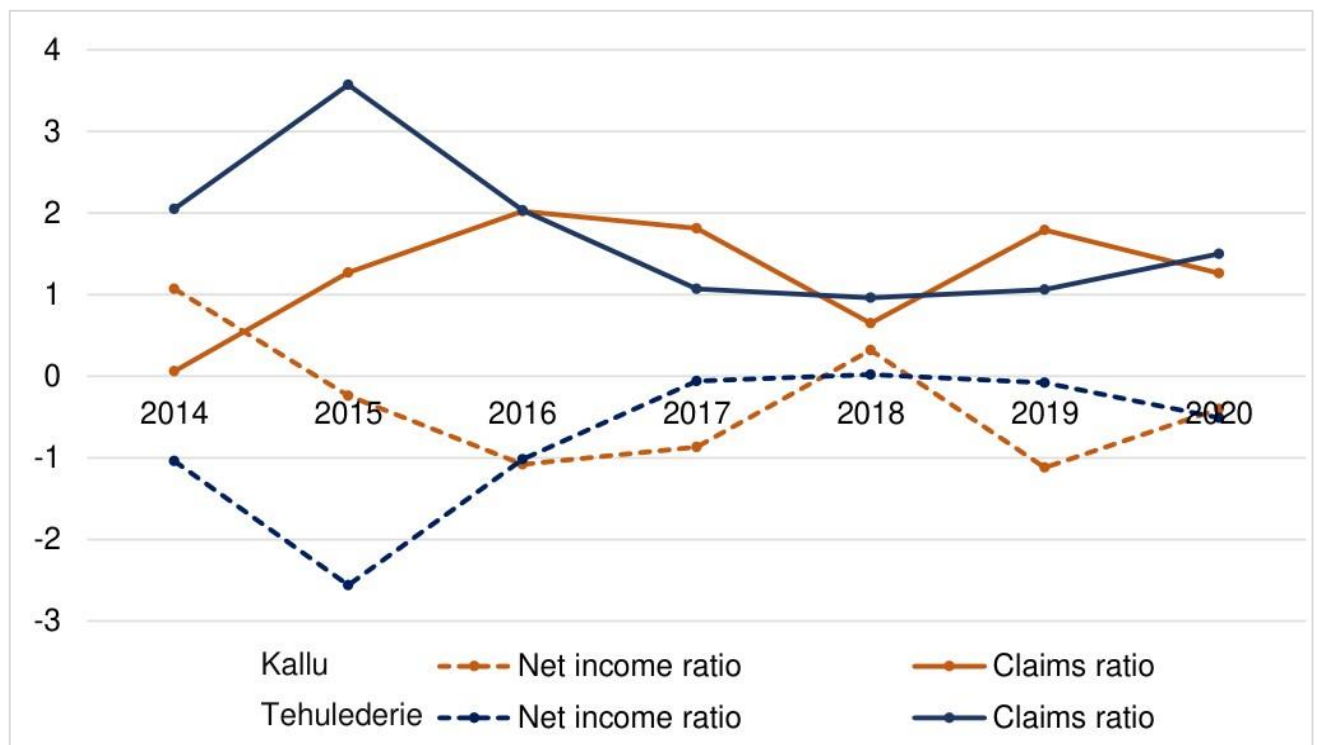
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SUSTAINABILITY OF A COMMUNITY-BASED HEALTH INSURANCE SCHEME AND UNDERLYING CHALLENGES IN TWO DISTRICTS OF NORTHEAST ETHIOPIA

MOHAMMED HUSSIEN (MPH/HSM)



January 2023



BAHIR DAR UNIVERSITY, COLLEGE OF MEDICINE AND
HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH

SUSTAINABILITY OF A COMMUNITY-BASED HEALTH
INSURANCE SCHEME AND UNDERLYING CHALLENGES IN
TWO DISTRICTS OF NORTHEAST ETHIOPIA

A DISSERTATION SUBMITTED TO SCHOOL OF PUBLIC HEALTH, COLLEGE OF
MEDICINE AND HEALTH SCIENCES OF BAHIR DAR UNIVERSITY, IN PARTIAL
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PHILOSOPHY (PhD) IN PUBLIC HEALTH (HEALTH SYSTEM MANAGEMENT)

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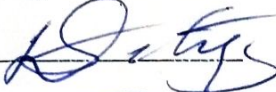

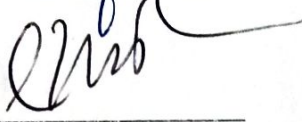

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Dissertation Approval

Sustainability of Community-Based Health Insurance Scheme and
Underlying Challenges in Two Districts of Northeast Ethiopia

By: Mohammed Hussien Adem

APPROVED BY THE EXAMINING BOARD

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Declaration

I, the undersigned, declare that this is my original work, has never been presented in this or any other university for fulfillment of other degrees or qualifications, and that all the resources and materials used for the thesis have been fully acknowledged.

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A handwritten signature in blue ink, appearing to be 'Mohammed Hussien', written over a horizontal line.

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List of original papers

This dissertation is based on the four original papers, which are listed here under. Two papers with quantitative studies and two papers with mixed methods studies were produced from the data collected for this dissertation.

- I. **Hussien M, Azage M, Bayou NB.** Continued adherence to community-based health insurance scheme in two districts of northeast Ethiopia: application of accelerated failure time shared frailty models. *Int J Equity Health.* 2022;**21**(1):16. doi:[10.1186/s12939-022-01620-9](https://doi.org/10.1186/s12939-022-01620-9)
- II. **Hussien M, Azage M, Bayou NB.** Perceived quality of care among households ever enrolled in a community-based health insurance scheme in two districts of northeast Ethiopia: a community-based cross-sectional study. *BMJ Open.* 2022;**12**(10):e063098. doi:[10.1136/bmjopen-2022-063098](https://doi.org/10.1136/bmjopen-2022-063098)
- III. **Hussien M, Azage M, Bayou NB.** A mixed methods study of community-based health insurance enrollment trends and underlying challenges in two districts of northeast Ethiopia: a proxy for its sustainability. *PLoS ONE.* 2022;**17**(8):e0266583. doi:[10.1371/journal.pone.0266583.g002](https://doi.org/10.1371/journal.pone.0266583.g002)
- IV. **Hussien M, Azage M, Bayou NB.** Financial viability of a community-based health insurance scheme in two districts of northeast Ethiopia: a mixed methods study. *BMC Health Serv Res.* 2022;**22**(1):1072. doi:[10.1186/s12913-022-08439-8](https://doi.org/10.1186/s12913-022-08439-8)

Abbreviations and Acronyms

AFT	Accelerated Failure Time
AIC	Akaike's Information Criterion
ANOVA	Analysis of Variance
BIC	Bayesian Information Criterion
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CBHI	Community-Based Health Insurance
DIC	Deviance Information Criteria
ETB	Ethiopia Birr
GDP	Gross Domestic Product
HCP	Health Care Provider
HEW	Health Extension Worker
ICC	Intra-Class Correlation
IDI	In-Depth Interview
IFI	Informal Field Interview
KII	Key Informant Interview
KM	Kaplan-Meier
KMO	Kaiser-Mayer-Olkin
LMIC	Low and Middle-Income Country
OECD	Organization for Economic Cooperation and Development
ODK	Open Data Kit
OOP	Out of Pocket
PQoC	Perceived Quality of Care
SD	Standard Deviation
SHI	Social Health Insurance
SSA	Sub-Saharan Africa
UHC	Universal Health Coverage
WHO	World Health Organization

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Abstract

Background: The health financing systems in low- and middle-income countries mostly rely on out-of-pocket payments. Many of these countries, including Ethiopia are implementing community-based health insurance schemes as an alternative to user fees in reaching the goal of universal health coverage. Apart from a few successful experiences, the schemes face different sustainability issues in the context of most of these countries. In Ethiopia, the sustainability of the scheme and its challenges has not yet well-investigated.

Objective: The purpose of the dissertation was to investigate the sustainability of the community-based health insurance schemes and underlying challenges with a focus on the performance of the scheme and the quality of health care in two districts of northeast Ethiopia, Tehulederie and Kallu.

Methods: Both quantitative and qualitative research methods were employed to address the objectives of the study. A community-based cross-sectional study was employed to measure membership adherence and perceived quality of care. The study population of interest includes households in selected *Kebeles* of the two districts who have ever been enrolled in the scheme.

A three-stage random sampling was employed to obtain the representative sample for each district to measure the time to drop out of the scheme, the perceived quality of care, and related factors. For the household survey, a pretested structured questionnaire was administered face-to-face to 1232 household heads in the community by trained data collectors. A desk review was conducted to obtain relevant data at the scheme offices and health centers. Additional data on facility-level factors that influence the perceived quality of care were obtained through self-administered questionnaires among 194 health care providers working in 12 health centers.

A mixed methods case study was employed to evaluate the performance of the scheme. The databases of the two schemes were reviewed retrospectively using selected key performance indicators to evaluate the trends in membership growth and financial viability. Qualitative data were collected through key informant interviews, in-depth interviews, and informal interviews to explore the underlying challenges that impede membership development efforts and the financial viability of the scheme. The study participants include scheme personnel, district health officers, health facility directors, health care providers, health extension workers, *Kebele* leaders, and community members. The participants were selected purposively using the maximum variation approach and the sample size for each study district was decided based on the notion of data

saturation, with no new information emerging from participants. A total of 28 formal interviews were conducted face-to-face by the principal investigator. Informal interviews were also made during visits to the various setups to capture important information that could be triangulated with the findings of the formal interviews.

The relationship between the time to drop out and the explanatory variables was examined using the accelerated failure time shared frailty models by assuming the time to drop out of the scheme is correlated within the clusters (*Kebeles*), while the relationship between the perceived quality of care and associated factors was assessed using multilevel linear regression model thereby the characteristics of the respondents and health centers were considered as individual and group-level variables respectively. Exploratory factor analysis was performed to assess the validity of the questionnaires designed to measure the perceived quality of care, and some exploratory variables with composite measures, while the reliability of the scales was estimated by measuring the internal consistency using Cronbach's alpha.

To address objectives III and IV, trends for each performance indicator of the schemes were analyzed descriptively for the periods under review. The data from the interviews were audio recorded, transcribed verbatim, and translated into English. Thematic networks analysis was employed with both deductive and inductive coding approaches.

Results: In measuring the time to drop out, the total follow-up period was 6816 person-years of observation, with an average follow-up time of 5.53 years (95% CI: 5.38, 5.68). Overall, 29% of the study participants had dropped out of CBHI following their initial enrollment in the scheme with an incidence rate of 5.27 per 100 person-year. The marital status of the respondents, household size, presence of chronic illness, history of hospitalization, higher perceived quality of care, perceived financial risk protection, and higher trust in the scheme management were significantly associated with the time to drop out. Contrary to the literature, wealth status did not show a significant correlation with the time to drop out.

Regarding the perceived quality of care, the mean score was 70.28 on a scale of 20-100 with an SD of 8.39. Five dimensions of perceived quality of care were extracted from the factor analysis, with the patient-provider communication dimension having the highest mean score ($M = 77.84$, $SD = 10.12$), and information provision having the lowest ($M = 64.67$, $SD = 13.87$). Wealth status, current insurance status, perceived health status, presence of chronic illness, and recency of health

center visit were individual-level variables that showed a significant association with the perceived quality of care. At the cluster level, the work experience of health care providers, patient volume, and an interaction term between patient volume and staff job satisfaction also showed a significant association.

Over the study period (2017 to 2021), enrollment in the scheme at the study districts exhibited non-linear trends with both positive and negative growth rates being identified. Overall, the scheme in Tehulederie has a relatively higher population coverage and better membership retention compared to Kallu, which could be due to the strong foundation laid by a rigorous public awareness campaign and technical support during the pilot phase. The challenges contributing to the observed level of performance in both districts have been summarized under four main themes that include quality of health care, claims reimbursement for insurance holders, governance practices, and community awareness and acceptability of the scheme.

Both schemes experienced excess claims costs and negative net income in almost all of the study period. Even after government subsidies, the scheme's net income remained negative for some reporting periods. Adverse selection, moral hazard behaviors, medicine shortages, delays in service provider claims settlement, and low insurance premiums were the key challenges that have been highlighted as impeding the scheme's financial performance.

Conclusion: The study highlighted the importance of considering both individual and cluster level factors linked to people's membership adherence and the perceived quality of care to enhance the scheme's performance. The scheme experienced negative growth ratios in both study sites over five years period, showing that it is not functionally viable. The scheme in both districts also spent more than it received for claims settlement in almost all the periods under the study, and experienced heavy losses in these periods, indicating that it is not financially viable. This implies that the scheme could not be able to generate adequate funds to satisfy the health care needs of its members. Overall, the sustainability of the scheme in the study districts is in jeopardy. The scheme will inevitably fail to attain its mission unless relevant stakeholders at all levels of government demonstrate political will and commitment to address the existing implementation challenges, as well as advocate for the community.

Keywords: Sustainability, community-based health insurance, membership adherence, perceived quality of care, enrolment trends, financial viability, Ethiopia.

1. INTRODUCTION

This chapter presents the background of the study, the statement of the problem, the rationale of the study, and its objectives. The background of the study defines universal health coverage (UHC) and tries to describe the challenges faced by low and middle-income countries (LMICs) to reach the goal of UHC in terms of access to health care and financial protection from a broader perspective. It also attempts to show the relevance of better health care quality for the success of UHC. In the end, it outlines a brief situation of the health care financing mechanism in Ethiopia and the emergence of community-based health insurance (CBHI) in response to the health financing challenges faced by the health care system. The statement of the problem attempts to highlight the problems faced in the implementation of CBHI schemes in LMICs, the existing knowledge gaps, justifications, and the overall purpose of the study. The rationale of the study explains why the study was worth conducting and its significance for policymakers, researchers, and other relevant stakeholders.

1.1. Background

Sustainable healthcare financing is a fundamental component of the health system which is vital to realizing UHC [1-4]. In 2005, member states of the World Health Organization (WHO) agreed to reform their health financing systems to move more quickly towards UHC [5]. The purpose of UHC is to ensure that everyone has access to the health services they need, at a sufficient level of quality, and that using those services does not put them in financial hardship [6].

The lack of access to health care is an important problem faced by millions of people in LMICs. People in poor countries have less access to health services than those in wealthy countries. The poor in LMICs are consistently at a disadvantage in accessing health care [7]. A recent global estimate showed that the excess deaths of 3.6 million people in LMICs were due to the non-utilization of health care [8].

Quality of health care is central to the success of UHC initiatives. Health outcomes would be poor if services are of low quality and unsafe, even though access to essential health care and financial protection is achieved [8-10]. For example, the excess deaths of 5.0 million people in LMICs were estimated to be due to the receipt of low-quality health care [8]. An estimated 8.0 million deaths amenable to high-quality health care occurred globally in 2015, of which LMICs share 96% of the burden [11]. Due to productivity loss resulting from poor quality health care, LMICs incur an

estimated annual cost of \$1.4 to \$1.6 trillion. Poor-quality care has also more direct costs to health systems and individuals, like treatment costs associated with adverse events and overuse [12]. Substandard health care quality also undermines the sustainability of financing mechanisms of UHC, like the CBHI scheme. If health facilities fail to provide high-quality services, clients lose their trust in service providers and hence choose other care alternatives outside the system [13], and hence insurance members are unlikely to pay premiums for them [14, 15]. Low perception of health care quality further deters people from interacting with the health system in the future [16].

The health financing systems in LMICs largely depend on out-of-pocket (OOP) payments, and reliance on OOP health spending will continue in some countries into the future [17, 18]. Estimates indicate that 60% of the 184 nations will still fall short of the international health financing target of having government health spending account for 5% of GDP by 2040 [18]. The requirement to pay directly for health services at the time of utilization hinders the successful implementation of UHC targeted efforts. Millions of people lack access to health care because they have to pay for them at the time of utilization [5, 19]. An over-reliance on OOP payments in health financing is also an indicator of increased risk of catastrophic financial expenditure and impoverishment from getting health care. Because of direct payments for health services, an estimated 926.6 million people incurred financial catastrophes at the 10% threshold, and 89.7 million people were pushed into poverty at the \$1.90-a-day poverty line globally in 2015 [20].

Achieving UHC requires a strong commitment to move away from OOP payment to a prepayment, pooling approach that increases access to needed services, and spreads the financial risks of ill health across the population. A health financing system that provides sufficient and stable prepaid pooled resources for priority health services is a key to achieving UHC [5, 19]. There is a growing global commitment to reach UHC in the last few years. Many LMICs are reforming their health care financing systems to improve access to services and protect citizens from financial risks [21]. In LMICs, current strategies to reach UHC combine a variety of revenue sources to finance health care coverage and a variety of protection systems to cover all population groups, among which CBHI has got a prominent place to cover subsistence farmers and informal sector workers which account most of the population. A growing number of sub-Saharan Africa (SSA) countries are implementing small-scale voluntary CBHI schemes as a risk-pooling mechanism to address the access barriers posed by direct OOP payments [17, 22]. Through a prepayment mechanism, CBHI has the potential to increase the use of health services, reduce financial risks, increase awareness

of the value of insurance, and increase resource mobilization for health from the general population in LMICs [23].

In response to the challenges posed by the existing financial arrangements, Ethiopia has been executing a voluntary CBHI scheme since 2011, intending to cover the rural households and urban informal sector workers, who are believed to make up 85% of the population. The scheme was piloted in 13 districts located in four regions of the country [24]. Based on lessons learned from the evaluation findings, the scheme was first expanded to 161 districts in July 2013, and 827 districts as of July 2020 with population coverage of 50% [25].

The health sector has multiple financing sources, including the government treasury, bilateral and multilateral donors, household OOP expenditure, CBHI, and private employers. Donor funding, OOP payments, and government tax revenue are the three primary sources of financing for health care in the country. According to the sixth national health account of Ethiopia, the contributions of these financing sources in 2013/14 were 36%, 33%, and 30% respectively. The seventh national health accounts show still a high share of donors and households contributing 35% and 31% of the total health spending in 2016/17 respectively, with health insurance coverage sharing only 2%. Government treasury contribution has slightly increased to 32% from the previous round of national health account. The per-capita health expenditure was US\$33.20 in 2016/17, which is much lower than the WHO recommended US\$86 per capita spending for the delivery of essential health services available in low-income countries [26].

1.2. Statement of the problem

To attain the goal of UHC, it is vital to develop a sustainable health financing mechanism integral to the broader health system [1-4]. OOP payment, which is the main obstacle of UHC, can be reduced and replaced by prepayment and pooling approaches that generate stable and sufficient funds for health. It is essential to integrate and expand prepayment and community-based micro-health insurance schemes into the wider pool to realize UHC [5]. In recent years, CBHI has been chosen by many LMICs as a means to improve access to health care and to provide financial protection, especially for people working in the informal sector and the rural poor [17]. It is possible to shift away from OOP payments if such schemes are backed by government policies and well implemented, and they can be a sustainable source of health care funding for everyone who is covered under the schemes [27]. A sustainable CBHI contributes to equitable health care access, health sector financing, provider responsiveness, and quality of health care [22].

Apart from a few successful experiences, CBHI schemes in many LMICs faced different sustainability challenges due to their voluntary nature, small risk pools, and low revenue [17, 22, 28]. A CBHI model that relies solely on voluntary, small-scale schemes and small pools, with little or no subsidization of the poor and vulnerable, can only play a very limited role in advancing UHC [29]. In CBHI schemes, the healthy are either reluctant to enroll or cancel their membership after joining the schemes, leading to the existence of small-size pools with little capacity for redistribution of risks [30]. The financial risk protection ability of the schemes is still constrained by small contributions from low-income informal sector members [17, 23], the existence of insurance-related risks [31-33], insufficient risk management [28], and the inefficient use of the resources that are generated through the pools [5, 17]. Moreover, poor quality of health care is another obstacle that limits the sustainability of CBHI schemes [34].

It is imperative to generate a comprehensive set of empirical evidence on the sustainability of CBHI schemes for establishing higher-level pools that allow for cross-subsidy between high-risk and low-risk areas [23] and hence to move towards UHC [17]. In Ethiopia, enrollment in CBHI has been well addressed in prior studies starting from the piloting phase of the scheme [35-40]. Yet, the CBHI scheme has not been well investigated in terms of the quality of health care and scheme performance dimensions which are essential for its sustainability. To the best of our knowledge, there is no empirical evidence that uncovers the sustainability of CBHI in terms of scheme performance, the time to drop out of a CBHI scheme, and the quality of health care from the perspective of households in the community. Even though several studies have been carried out on the factors influencing dropout decisions [41-52], none of these looked into the ability of the schemes to retain members in the long term; that is, how long members adhere to the scheme and the factors associated with the time to drop out. Moreover, earlier studies have ignored the effect of cluster-level variables on dropout decisions.

Therefore, the purpose of our study was to investigate the sustainability of a CBHI scheme and underlying challenges in two districts of northeast Ethiopia. Specifically, it intends to examine the time to drop out of the scheme with its associated factors, measure the perceived quality of health care from the household's perspective, evaluate the performance of the scheme, and explore the different challenges impeding the effective implementation and sustainability of the scheme from the perspective of key stakeholders.

1.3. Rationale of the study

Ethiopia developed a 20-year health sector strategic plan to achieve UHC through the strengthening of primary health care since 2015. The health sector transformation plan, covering the period 2021 to 2025, set five transformation agendas as its priority areas: transformation in equity and quality of health care; health financing; development of motivated, competent and compassionate health care providers (HCPs), leadership, and information revolution. Optimization of the health insurance system is one of the major interventions aimed to address the major challenges to achieving UHC [53]. These transformational agendas are intertwined and complement one another. For instance, patient-centered care is a top priority of the transformation plan which is essential to improve equity and quality of health care, while quality of health care improvements and UHC efforts must go hand in hand to ensure the sustainability of the CBHI initiative and for a meaningful result in access to essential health services.

Although evidence is important to understand the progress in these priority areas, little is known about the sustainability of the CBHI scheme in terms of its performance, the ability of the scheme in maintaining its members, and the quality of health care provided under the scheme. Therefore, this study aims to investigate the sustainability of a CBHI scheme and underlying challenges in two districts of northeast Ethiopia.

The study has provided vital information that may be used to understand the current situation of the aforementioned priority areas, particularly the first three agendas. Specifically, the findings have created an understanding of the progress made so far on the move towards the set objectives of CBHI in the study districts and bring relevant lessons for other schemes. Decision-makers, implementers, and advocates of this initiative could be benefited from the findings to consider alternative approaches to face the identified challenges. The aim of the current health care financing strategy of Ethiopia is to establish a higher level-pool step by step at regional, and National levels [54]. The findings of this study may also be vital information for policymakers as they work to overcome potential obstacles in efforts to establish a unified pool system at the national level. The findings will also inform relevant stakeholders on clients' experience with the health service delivery which could be an important input for health care quality improvement initiatives. Furthermore, it will add value to the frontiers of knowledge for other researchers as there are limited studies on this area in Ethiopia so far.

2. LITERATURE REVIEW

This chapter deals with a review of the literature in relevance to the study objectives. The first section provides a general overview of CBHI in terms of its definition, forms, its role in supporting the progress towards UHC, and the development and rise of such schemes in Africa. The second section describes the design features of the CBHI scheme in Ethiopia. The third section provides an outline of the literature on the determinants of the sustainability of CBHI schemes. This section guides the development of the conceptual framework for the study. Relevant literature is reviewed concerning the different factors that influence the sustainability of CBHI schemes. The review reflects three different aspects of factors that influence sustainability: scheme design, scheme performance (membership growth, claims management and management of insurance-related risks), and quality of health care.

2.1. Community-based health insurance: an overview

2.1.1. Definition and forms of CBHI

CBHI is a generic term that covers a variety of nonprofit health financing schemes initiated by communities, providers, enterprises, and others to cover the health care financing needs of disadvantaged populations, especially in the rural and informal sectors [32, 55]. The different financing arrangements categorized under the CBHI scheme include mutual health organizations, health microinsurance, community health funds, rural health insurance, and revolving drug funds each designed for different population groups in its distinctive setting [22, 55]. CBHI schemes have a common goal of finding ways for communities to meet their health financing needs through pooled revenue collection, which allows members to contribute small premiums regularly, and to protect the risk of excess payments at the time of receiving health care [32]. In the context of health, risk protection refers to safeguarding an individual from critical income losses as a result of seeking care for an illness or injury [55].

In theory, all CBHI schemes share the following common characteristics: solidarity, where risk sharing is as inclusive as possible and membership premiums are independent of individual health risks; community-based social dynamics, where the schemes are organized by and for individuals who have predominantly low income, earning a subsistence from the informal sector, or are socially excluded and share common characteristics (like geographical, occupational, gender,

etc.); participatory decision-making, where the community is actively involved in driving the design and management of the scheme; nonprofit character; and voluntary affiliation [22, 29, 34]. This broad definition is inclusive of many different health-financing arrangements with these common characteristics. It also effectively distinguishes CBHI from other resource mobilization mechanisms, including OOP payments, social health insurance (SHI), voluntary private insurance, and general taxation. Health financing arrangements that meet this definition can still differ significantly in terms of objectives, structure, management, organization, and institutional characteristics. Based on these parameters, the common forms of community health financing schemes are community prepayment health organizations, provider-based health insurance, and government-run but community-driven health insurance [55].

2.1.1.1. Community prepayment schemes or mutual health organizations

These schemes are characterized by voluntary membership, prepayment of usually a one-time annual fee, and risk-sharing. Some of these schemes cover catastrophic benefits including hospital care and drug expenditures; others do not. The schemes are often initiated and supported by donor and government initiatives with strong involvement of the community in designing and managing the scheme. Schemes are typically not-for-profit [55].

2.1.1.2. Provider-based community health insurance

These schemes often revolve around single provider units such as a town or city or regional hospital. They are characterized by voluntary membership, prepayment of usually a one-time annual fee, risk-sharing, and coverage of catastrophic risks. They are frequently initiated by the providers themselves or through donor support. The involvement of the community is often more supervisory than strategic [55].

2.1.1.3. Government or social insurance-supported community-driven scheme

These community-based health financing schemes are attached to formal social insurance arrangements or government-run programs. The community actively participates in running the scheme, but the government or the social insurance system contributes a significant amount of financing. These schemes are not always voluntary, and some have referred to this category as district or regional health insurance. These financing initiatives are often initiated by the government and not the community [55].

2.1.2. The role of the CBHI scheme in supporting progress toward UHC

The majority of people in LMICs are self-employed, work in the informal sector, or are unemployed, which are excluded from tax-based financing or SHI where only 5–10% of the population is covered by these financing mechanisms. In these countries, CBHI is a better alternative to cover subsistence farmers and workers in the informal sector [23]. CBHI in low-income countries has the potential to increase health service utilization; provide financial risk protection; raise awareness and knowledge of the value of insurance; increase resource mobilization for health, and create an experience in managing risk pooling arrangements [23]. The existence of participatory decision-making by community members can enhance the transparency and accountability of the scheme. It also has the potential to enhance community empowerment and allow the voicing of community members' concerns and expectations in the management of local health systems. It can also build trust and confidence in risk pooling among participants through their direct experience in limiting abuse and fraud through strong community control mechanisms [23, 29].

However, a CBHI model that relies solely on voluntary, small-scale schemes and small pools, with little or no subsidization of the poor and vulnerable, can only play a very limited role in advancing UHC [29]. Under such schemes, financial risk protection is constrained by the limited membership contributions from low-income informal sector members, and only moderate access to needed health care is available for those enrolled. Evidence suggested that participation in such CBHI schemes has been quite low in most nations, and the poor and other vulnerable population groups are mostly excluded. Besides, CBHIs are usually small, fragmented pools with little ability for risk redistribution. The rationale for pooling at a level close to the community is contradictory to the principle of accumulating funds and sharing risks in a large pool. Furthermore, the poor and other vulnerable population groups receive little or no subsidization [23, 29, 55].

Financial protection plans based on large pools and mandatory or involuntary enrollment funded by some type of taxes to subsidize those unable to pay are considered as having more potential to move towards UHC [29]. For countries with established CBHI schemes, a desirable option is to integrate and merge existing sub-pools by pooling parts of or all funds at higher levels, and ultimately move towards a national pool [23, 29]. Small and independent CBHI schemes must gradually evolve into a nationwide model, along the way addressing the inherent limitations [23].

2.1.3. The rise of CBHI in Africa

The CBHI schemes in Africa are mostly imported interventions of foreign aid agencies or national governments. The early initiatives in Africa were led by expatriate development aid workers familiar with the history and administration of Europe's SHI systems [22, 34]. The schemes initially focused on providing coverage to subsistence farmers and others in rural areas, with each scheme serving a village or a few villages. In some countries, the schemes expanded to include informal sector workers in urban areas, often through informal worker associations. Subsistence farmers and informal workers account for most of the working population in SSA and are groups that cannot easily be reached through formal social security systems. In terms of population coverage, CBHI schemes vary significantly across and within nations [17].

The CBHI schemes were first initiated in West Africa in the 1990s, particularly in Francophone countries such as Senegal, Benin, and Burkina Faso, and spread to Central and Eastern Africa over time. CBHI schemes were predominantly launched by non-governmental organizations in West Africa, however, in Central and Eastern Africa, health service providers and governments played a significant role in the introduction and administration of such programs [17, 22, 34]. From the early 1990s on, the African CBHI movement began to receive increased foreign assistance, notably from organizations with strong ties to the European SHI model. Gradually the movement gained strength, and governments and donors became interested in the potential of CBHI to increase access to essential health services in adverse conditions [17, 22, 34]. Following the formation of a regional network of actors and promoters of CBHI, which supported and monitored the development of the schemes in Africa, mainly in francophone West Africa, an explosion of new initiatives throughout West Africa has been observed. This led to a sixfold increase in the number of schemes between 1997 and 2003, with almost 600 CBHI initiatives registered in 2003 in francophone West Africa alone [22].

Except for Rwanda and Ghana, many low-income countries continue to confront major challenges in initiating, maintaining, or scaling-up CBHI programs despite several years of implementation experience [23]. Rwanda and Ghana are the first low-income countries in SSA that have made significant progress towards UHC by reshaping a system of local CBHI initiatives into a national health insurance program [22, 23]. Ethiopia may be the next country to get closer to universal coverage through the expansion of the CBHI scheme [22].

2.1.4. Overview of the CBHI scheme in Ethiopia

Ethiopia is implementing a voluntary CBHI scheme, which is aimed to cover the rural households and urban informal sector workers, which constitute an estimated 85% of the country's total population. The scheme was launched as a pilot project in 13 districts across four regional states in 2011, as part of the health financing reform aimed at meeting the goal of UHC [24]. Based on lessons learned from the evaluation findings, the scheme was first expanded to 161 districts in July 2013, and 827 districts as of July 2020 with population coverage of 50% [25].

The design of the Ethiopian CBHI pilot program took a lesson from the experiences of other countries, particularly those that are thought to have been successful. The design team gained knowledge of various perspectives on what works and what does not, as well as an understanding of the comparative CBHI models, through the review of best practices from around the world and study tours to Ghana, Mexico, Rwanda, and Senegal [24]. The CBHI scheme is run by the government with community involvement in scheme design, management, and supervision. *Kebeles* (Sub-districts) decide whether or not to join the scheme based on a simple majority vote. Once a *Kebele* agrees to join, individual household enrollment is voluntary and membership needs to be renewed annually with the willingness of the members. To minimize adverse selection, the unit of enrollment was decided to be at the household level. The basic design of the scheme in terms of benefit packages, registration fees, premium payments, and co-payments was determined by regional health administration officials based on feasibility studies. The scheme parameters differ slightly across the four regions but are similar within the regions [24, 56].

Premiums and government subsidies are the scheme's main sources of revenue. The federal government provides a general subsidy that constitutes 25% of total annual enrollment contributions. Furthermore, regional and district administrators offer targeted subsidies as a fee waiver to cover the health care costs of 10% of the target population who are indigents. Scheme management costs (salaries, office space, and operational costs) are also financed by the government budget [24, 56]. Premiums are set at the household level based on core family members (a mother, father, and their children under the age of 18) and additional annual premiums must be paid for each non-core family member. Regional states have the authority to update the premium based on local circumstances. For instance, the initial annual premium in the Amhara Regional State, where this study has been conducted, was 8.34 US dollars regardless of family

size [24]. Eventually, it was changed to varying amounts of contributions dependent on family size. At the time of the study, the annual premiums in rural areas range from 8.89 dollars for families with 1-5 members to 12.19 dollars for families with eight or more members, with an extra 2.54 dollars to be paid for each non-core family member [57].

The benefits packages cover all inpatient and outpatient services at public hospitals and health centers within Ethiopia, except for cosmetic treatments, organ transplants, chronic renal dialysis, treatment for exempted services, and non-generic medicines [24, 57]. To receive health care without co-payment, members are required to follow the referral path while seeking health care. Patients are supposed to visit the nearest health centers as their first level of contact in seeking health care and are subsequently referred to a higher-level facility when necessary. If they bypass the nearest health centers and receive health care from hospitals without having a referral letter from health centers, the scheme covers only 50% of the cost of health care, and the members cover the remaining 50% co-payment [24, 56]. This, however, was later revised in the Amhara Regional State such that individuals who bypass health centers and seek treatment at hospitals without a referral letter were not eligible for any reimbursement under the scheme [57].

2.2. Determinants of the sustainability of CBHI schemes

2.2.1. Scheme design

A scheme's financial performance is a function of contributions, the cost of health care consumed by the insured, the level of external subsidy, and the size of the pool which are highly influenced by the design of the scheme. An appropriate design of CBHI schemes is vital in preserving its financial, functional, and institutional sustainability and for a wider reach of the population in the informal sector [58]. Yet, many CBHI schemes face sustainability challenges due to weaknesses in their design. In Senegal, many mutual health organizations faced financial sustainability problems which are in part due to the design features of schemes. Mainly this was due to the frequent expansions of the benefits package, with a fixed premium payment [32].

In Ghana, the national health insurance scheme exhibited a deficit attributed to the insufficient premium paid by the informal sector compared to the cost of health care. As a result, containing costs and paying claims regularly is the greatest challenge facing the scheme [59-61]. This has contributed to chronic cash shortfalls at accredited facilities, leaving providers without the needed funds to pay salaries and procure supplies. Service providers threatened to stop attending to

insurance cardholders or close down their facilities for lack of funds [59]. The generous benefits package which incentivizes subscribers to overutilize the benefits, and the lack of cost-sharing measures such as co-payments, deductibles, or ceiling in the scheme's design accounted for the high claims cost. Besides, the majority of people covered by the scheme were exempted from premium payment and this put lots of financial pressure on the scheme [60-63].

In a community health fund in Tanzania, where there is counsel specific premiums and benefits packages, the counsel with a smaller premium and bigger benefits package was able to enroll higher members of the scheme, but the scheme faced a lack of financial sustainability due to lower revenue and higher cost. In contrast, the council with a higher premium and a smaller benefits package had substantially higher revenue, but the enrollment ratio was too low [64].

In Ethiopia, some schemes showed a negative balance and could not cover the health care cost of the scheme members. This was in part due to the low premium paid by households [24]. Other studies also reported that the higher premium amount relative to the ability of most of the people in the informal sector to afford it [35, 65, 66] and the limited benefit package [67] were the main barriers to enrollment in CBHI schemes.

2.2.2. Membership growth

The growth ratio measures how fast the number of clients in the scheme is increasing or decreasing. The growth, coverage, and renewal ratios are key indicators for measuring the membership status of a voluntary insurance scheme, which influences its functional and financial viability [68-71]. When the growth ratio increases, there will be increased revenue, lower marginal cost, and lower health care costs as we can reduce adverse selection by retaining relatively healthy members. In case of a decreasing rate of new subscribers or higher dropout rates, those who left the scheme are more likely chronically ill members and high-risk age groups. This results in higher claims cost, increased administrative expense, and reduced net income and hence threatens the financial sustainability of the schemes [68, 69, 72].

The overall membership growth ratio does not always provide all the information on the enrollment trend. There may be internal "movement" within the scheme, which means that some individuals are joining while others are dropping out. To assess the enrollment trend more precisely, it is necessary to analyze whether members are continuing to pay premiums and whether new individuals are joining the scheme. Even if the growth ratio is positive, measuring the renewal

ratio may be worthwhile to clarify potentially misleading situations [69]. The renewal ratio is an indicator of members' satisfaction and the capacity of the scheme to retain its members [68, 71].

Apart from a few successful experiences, CBHI schemes suffer from the problem of low enrollment across SSA countries. The problem of low enrolment is aggravated by the fact that most schemes operate independently of one another, limiting the potential size of pools. Even schemes with comparatively high coverage rates experience significant membership swings. Low coverage ratios are problematic because they reflect a lack of resource mobilization, which jeopardizes the sustainability of schemes and the stability of financial resources made available to providers [28]. A review of studies on health insurance schemes in four SSA countries showed that the presence of a large informal sector whose members are primarily uninsured, as well as a high dropout rate from the schemes, were among the key problems facing the schemes to sustain and fulfill the goal of UHC [62]. A systematic review also reported that a low renewal rate is one of the challenges that undermine the financial sustainability of CBHI schemes in Rwanda and Uganda [73].

In Ethiopia the overall enrollment or coverage ratio increased, on average, the longer schemes were in operation based on the enrollment data of 23 schemes. The majority of schemes were able to increase the coverage ratio year-on-year. Between the first year of operation and the last year that data were available, 16 of the 23 schemes saw a net increase in the coverage ratio with the average increase from 27% to 36%. However, 20 of the 23 schemes experienced negative coverage ratios ranging from one to three enrollment periods during the study years. After the second year of operations, enrollment from renewals stabilized across most schemes. Overall, after the first year of operation, 78% of enrollment were from renewed households which range from 69% in the second year to 82% in the latest year of operation [74].

2.2.2.1. Factors associated with CBHI membership renewal

The sustainability of CBHI depends to a greater extent on the capacity of schemes to retain their members. Although initial uptake is important, scheme sustainability requires continued membership adherence [50]. The decision to renew membership is affected by a number of demand and supply-side factors.

2.2.2.1.1. Socioeconomic characteristics

A systematic review of factors that affect CBHI schemes in low- and middle-income countries showed that the socioeconomic status of the household; household head's age, gender, marital status and educational level; household size; and distance to the nearest health facility were positively associated with membership renewal decisions [14].

The socioeconomic standing of households is significantly associated with policy renewal decisions regardless of whether it is expressed in terms of income, expenditure, or asset category. Households with higher economic status are more likely to renew their policy compared to those with lower economic status [41, 44, 47, 48, 50, 51]. For example, in Bangladesh, members in the fourth and the highest asset quintiles were respectively 2.2 and 2.7 times more likely to renew membership compared to the lowest quintile after controlling for the effect of other independent variables [47]. In Ethiopia households from the poorest quintile were more likely to continue in the scheme as compared to those in the richest fourth and fifth Quintiles, while households belonging to the second quintile were less likely to continue. The possible reason is the existence of social support such as fee waiver benefits available to the poorest households where the insurance premium is covered by government organizations [48]. Other studies revealed that higher socioeconomic status is associated with a decrease in dropouts from insurance membership, but with no statistically significant effect [42, 46, 49]. One study in Indonesia identified income stability and experiencing financial hardship as significant factors that influence the sustainability of premium payments. Households with more income stability tend to have an 11-percentage point higher probability of paying the premium regularly than households who have unstable income while experiencing financial hardship has a negative influence as they prioritize expenditures essential for daily life over insurance premiums [75].

The age of the individual respondents and household heads is associated with the decision to prolong their scheme participation, but with a mixed effect. Some studies report that older individuals were less likely to drop out of the scheme as compared to younger individuals with a statistically significant association [44, 51, 75]. On the contrary, two studies from Ghana and Senegal reported that younger individuals/household heads were less likely to drop compared to older ones [49, 76]. Some studies treated age as a continuous variable (in years) while others use age as a dummy variable with a different basis of categorization.

The gender of the individual and household head is another significant determinant of policy renewal. Female-headed households were found to be less likely to cancel their policy as compared to male-headed households [43, 76]. On the contrary, a finding from Ghana reveals that male-headed households have lower odds of dropping out [41]. According to studies from India [42], Senegal [49], and Sudan [46], the respondent's gender has no significant effect on the decision to drop out of the scheme.

The level of education also plays an important role in members' renewal decisions. The household heads or scheme members who attended more years of education were more likely to renew the scheme policy compared to their less educated counterparts [44-47]. For instance in Bangladesh renewal rates among households where the head had an educational level of class six and higher were found to be significantly higher than among their counterpart households, where the heads had a lower level of education [47], and in Sudan household heads with higher educational attainment are less likely to drop out of the scheme because they might have a better understanding of the health insurance scheme [46].

Household size is another factor associated with the decision to remain or drop out of insurance membership once enrolled in the schemes. A study in Indonesia reported that household size plays a positive role in the decision to continue scheme membership [75], while another study in Ghana found that individuals with a large household size were more likely to drop out of the scheme [44].

Place of residence (rural or urban) also affects renewal decisions. Three studies revealed that individuals living in urban or semi-urban areas were more likely to renew their policy compared to rural dwellers and the association is statistically significant [45, 50, 76].

Distance to the nearest contracted health facility was reported as either a barrier or facilitator of policy renewal by different studies. Three studies from Bangladesh, Senegal, and Uganda reported that increased distance to the nearest contracted health facility is associated with an increase in the likelihood of dropping out of the schemes [47, 49, 51]. A study finding in Bangladesh showed that members residing in villages adjacent to village health posts had significantly higher renewal rates than their counterparts in villages non-adjacent to village health posts [47]. In Senegal respondents who renewed their insurance membership were more than twice as likely to be situated closer to a health service provider than those who drop out of the insurance and were three times more likely to report that health care access is an advantage of insurance membership [49]. Contrary to

these findings, distance to the nearest health facility was found to be an enabler for policy renewal. In Sudan households that are located more than 5 km away from the nearest health facility are less likely to drop out than those located near health facilities [46]. Other studies reported that distance to the usual source of health care is not statistically linked to the probability of membership renewal [42, 48, 50, 75].

2.2.2.1.2. Awareness and participation in the scheme

Knowledge and understanding of the concept of health insurance and its principles and participation in the scheme and other voluntary groupings were reported as important factors influencing membership renewal. Understanding health insurance positively influences the decision to renew membership, even though different measurement indexes are used in different studies. Respondents who have a good understanding of the scheme were more likely to renew their policy and pay the premium regularly compared to those having low knowledge [46, 51, 75].

A study in Senegal found that members were more likely to report that solidarity is an advantage of CBHI membership compared to ex-members indicating their understanding of the scheme's benefit [49]. The findings of qualitative studies showed that members dropped out of the schemes because of the low awareness of the benefit of the insurance plans [48, 77] and the lack of awareness of the risk-sharing principle [78-80]. The authors pointed out that people who did not feel sick and utilized health care dropped out of the scheme because of a lack of awareness and poor understanding of the risk-sharing principle. A study in Ethiopia identified that members of a safety net program were more likely to renew scheme membership, pointing out that households covered by this program were receiving ongoing information regarding health insurance from government officials as part of integrating different development interventions [48].

A study in Senegal found that the rate of active participation in the scheme is a facilitator for policy renewal. Respondents from the renewed group were more likely to have had informal discussions about the scheme; participated in awareness-raising and/or information dissemination; voted in scheme elections; attended a general assembly; and received training compared to ex-members. Members were also being more likely than ex-members to be informed of mechanisms of controlling scheme abuse or fraud and think they could influence scheme operation [49]. In Ethiopia, individuals holding an official position, including village officials, heads of traditional organizations, religious leaders, and other people of influence were less likely to drop out of the

scheme. These population groups received detailed training on the design features of the pilot CBHI and actively participated in awareness-raising activities [48].

Participation in other voluntary groupings, which is a measure of social capital was reported as an enabling factor for membership renewal. Belonging to an additional voluntary group and belonging to a large burial group was associated with an increased likelihood of renewing membership [51]. Member households were more likely to belong to more community associations than ex-members [49]. On the contrary, membership in other insurance and social protection schemes significantly reduces the probability of paying premiums regularly [75].

2.2.2.1.3. Scheme administration

These factors include satisfaction level from the insurers, waiting time at the scheme office, visits by agents during the renewal period, convenience in card collection, and trust in scheme management. Members who were satisfied with the overall scheme services [49] and spend a shorter waiting time to receive scheme services [44] were more likely to renew their membership. Respondents who were satisfied with the collection of scheme cards were more likely to renew their health insurance [43]. This is supported by qualitative studies which showed that members dropped out of the scheme due to a delay in processing the insurance membership cards after registration, and the annual renewal of the membership cards [79, 80]. The inability of scheme members to obtain health care services without having the membership cards at hand was mentioned as a reason to drop out of the scheme [61, 80, 81]. Subscribers' trust in the management of the scheme was also reported as a key factor influencing policy renewal. Subscribers who trusted the management of the scheme were more likely to renew their policy [14, 15, 49, 82]. A study based on a literature review showed that members' lack of trust in the integrity of the schemes and their administrators has also been identified as the main problem facing the schemes [83].

2.2.2.1.4. Need factors

Individuals or households who had more health care needs tend to continue their scheme subscription. These factors include the perceived health status of households, presence of chronic illness, recent illness episodes or injuries, and presence of children under five years of age or elders above 65 years of age in the household and they mainly point out the possible existence of adverse selection [15, 45, 49, 76]. According to the reports of systematic reviews on factors

affecting CBHI membership renewal, the health status of households, including perceived health status and the presence of chronic illnesses or higher frequency of illness episodes within the past few months [14, 15], and the presence of elderly people over the age of 65 in the household [14] were significantly associated with the decision to renew membership.

Concerning the perceived health status, households who rated the health of the family as poor were more likely to renew their policy compared to those who rated their health status as good with statistically significant effects [43, 44]. However, a study in Ethiopia found a different result with those households rating their health status as good being less likely to drop out of the scheme, but the effect is not statistically significant [48].

The presence of chronic illness within the household is positively associated with renewals with a statistically significant effect as reported by studies in India, Sudan, and Ethiopia [46, 48, 50]. Other studies in India and Senegal showed that the presence of chronic illness within member households is not significantly associated with renewal decisions [42, 49].

In Burkina Faso, households with more episodes of illness in the past three months had a lower probability of dropping out of CBHI [45], and in Senegal, those households who renew their membership were twice as likely to have had an illness, accident, or injury, and nearly twice as likely to have a disability than those who drop out of the scheme [49]. In Ethiopia, however, it was found that households with recent illness episodes were more likely to discontinue their participation in the CBHI scheme [48].

The presence of children or elderly people, which is an indicator of more health needs in a household, was reported as a factor affecting renewal. According to a study in Burkina Faso, the presence of people over 65 years old and under-five children in the household was significantly associated with contract renewals [45].

2.2.2.1.5. *Benefit factors*

The benefit factors include the use of health care (outpatient or inpatient), frequency of health facility visits, claims experience, and perceived benefits of the schemes. As described below, those who have benefited from the scheme or perceived the scheme as beneficial were more likely to extend their membership.

According to studies in Bangladesh and India, the number of benefit claims received was significantly associated with policy renewal. Households who have received higher benefits from the scheme were more likely to renew their membership compared to their counterparts who received no benefit [42, 47]. A systematic review reported that health care utilization under the scheme positively affects the renewal decision of the members [15]. Studies in Ghana, Sudan, and Ethiopia also identified that members who utilized health care were more likely to renew their membership than those who did not utilize it [46, 48, 76]. In addition to utilization, the frequency of use also influences renewal decisions. The proportion of the insured that utilized health care and renewed their insurance membership increases with the increasing frequency of health facility visits. Member households who visited health facilities more frequently were more likely to renew their membership [47, 76]. Households that never utilized insurance benefit services also tend to pay the premium irregularly [75].

In addition to the actual benefit received, respondents made decisions on renewing their insurance policy based on the perceived benefits of the scheme. Respondents who perceived that joining the scheme stands to benefit them through health care access were more likely to renew their policy [43, 49]. Perceived financial risk protection also played an important role in individuals' decisions to adhere to the scheme. Those who believe that joining the scheme will help them to save money from paying hospital bills were more likely to renew their membership [15, 43].

2.2.2.1.6. Perception of quality of health care

A high rate of membership renewal is an indicator of client satisfaction with the healthcare services provided while member dropout may indicate a poor service or lack of trust in the healthcare environment. When subscribers perceive that the quality of health care is optimum, they will maintain their membership [14, 15, 84]. For example, in Burkina Faso, the quality of care is an important factor influencing the decision to drop out of insurance, the better perception a household head holds of the quality of the care available, the less likely they will choose to discontinue the household insurance membership [45]. A study in Ghana showed that 68% of respondents cite low satisfaction with the service provider as a reason for dropping out, making the poor quality of service an important barrier to renewal [85]. In Ethiopia, 62% of households think that the quality of care is not good, although this figure does not differ across contract renewal statuses [48].

Different dimensions of health care quality have been reported as barriers or facilitators of renewal decisions. According to a systematic review of factors affecting renewal of insurance membership, members dropped out of the schemes due to HCPs' lack of technical competence, dissatisfaction with the negative attitude of providers toward patients, providers' rude behaviors, long waiting queues, preference given to cash-paying uninsured patients, differential treatment depending on patient's socioeconomic status and unavailability or shortage of prescribed medicines [14].

The behavior of HCPs and their attitude towards the insured clients also plays an important role in members' renewal decisions. As explored by different qualitative studies, the clients decided to drop out of the scheme because of the misbehavior of health professionals [45, 77-79] and the differential treatment of the insured in favor of the uninsured patients [78-80, 86]. For example, inside contracted health facilities, health care workers frequently withhold medication from insured patients, treat them rudely [77], receive illegal payments for medicines from insured patients [79], and provide quick service for non-members [80]. On the contrary, members renewed their membership because some health providers showed positive behavior towards them [79, 86], Doctors and Nurses take enough time for them, and they obtain prompt health services [86].

Scheme members who obtained diagnosis services before medicine prescription [44, 48], those supplied with the prescribed medicines, and provided with surgery services free of charge when necessary were more likely to renew their membership [44]. Other studies reported that members dropped out of the schemes due to the lack of prescribed medicines in the contracted health facilities which forced them to pay extra payments outside [67, 78-80], and that they have been given poor quality medicines [45].

Long queues and delays in accessing health services have been also reported as reasons for dropping out [67, 81, 87]. A study in India showed that reducing the time to access outpatient care by 10 minutes would increase insurance membership renewal by 5 percentage points [42].

2.2.3. Claims management

2.2.3.1. Claims cost

Claims payment is the primary cost driver of CBHI schemes. A high incurred claims ratio shows that subscribers are aware of the benefits of the scheme and are using them. However, a higher-than-expected incurred claims ratio might be due to supply and demand-side moral hazards, adverse selection, and inflation of medical services. A consistently low incurred claims ratio

shows that the benefits are not relevant to the insured or the insured finds it difficult in accessing the full continuum of services in the benefits package [68].

Paying claims regularly is the greatest challenge facing the national health insurance scheme in Ghana [59, 63, 85]. A systematic review also reported that CBHI schemes in Rwanda and Uganda showed weak financial sustainability because of high claims-to-revenue ratios and high operational costs [73]. According to the evaluation of the pilot CBHI scheme in Ethiopia, the claims ratio stands at about 75% of the contributions. When the general and targeted subsidies are included in the denominator, the claims ratio became 43.2%. However, some schemes have had a negative balance [24].

2.2.3.2. Promptness of claims settlements

Promptness of claims settlement is another scheme performance indicator. It is a quality indicator of scheme services that helps to address the question of how responsive is the scheme to the needs of health service providers [68]. Insurance administrators' adherence to the stipulated time for payment of medical bills would be important to ensure that health service providers are financially resourced to procure needed supplies and deliver continuous health services to insured members. A delay in claims payment contributes to poor quality of health care, which further negatively influences the members' decision to renew their membership or others to join the scheme [86]. However, a delay in claims payment for health service providers is a critical concern threatening the functional sustainability of many insurance schemes. It leaves health service providers to stop attending to insured clients or issue prescription forms to buy drugs at private pharmacies in different countries [59-61, 63, 79-81, 88, 89]. For example, in Ghana, about 99% of medical claims were paid beyond the stipulated period of 28 days [88]. Delays in reimbursements may be created by the inability of health service providers to submit claims in a timely way or difficulties with processing of claims by scheme personnel due to the absence of the relevant skills and qualifications in insurance [60]. The Yirgalem CBHI scheme in southern part of Ethiopia could not reimburse health facilities for six months which was due to a lack of funds. This imbalance was due to low premiums and higher health care utilization [24].

2.2.3.3. Claims rejection ratio

The main objective of designing claims administration is to prevent fraud (both provider-induced and client-induced fraud) and minimize irrational claims expenses by closely monitoring claims

and payment reimbursements [90]. The claims rejection indicator reflects how well the insured understands the health insurance scheme. The reasons for both high and low claims rejection ratios should be examined as both directions might indicate weak administration. A low claims rejection ratio may indicate the inability of the claims review system to detect unnecessary or fraudulent claims. A high claims rejection ratio also shows that both the insured and the health service providers are unaware of the benefits being offered, and it could also indicate that the health service providers are filing false claims. Whatever the causes are, a high rejection ratio harms the renewal, growth, and coverage ratios because members develop a negative perception of the scheme [68].

A study in Ghana identified a low rejection ratio of 2.7% over its study period. The low rejection rate was attributed to either health service providers' good awareness of the health insurance system in claims preparation or claims officers' lack of technical skill in the medical sector, limiting their ability to detect fraudulent claims and reduce claims expenses. Some of the common reasons why claims are completely rejected or only partially paid include membership ineligibility, overbilling of medicines, overbilling of services, treatment-diagnosis mismatch, and duplications [63]. Fraud and corruption were also reported as threats to the financial sustainability of the scheme for which clinical audits have revealed this problem on the part of service providers. This was attributed in part to the weak claims review system in its ability to reject false claims and cut down costs [60]. In Ethiopia, members visit private pharmacies without full information on what is required for reimbursement (essentially, getting a receipt and submitting it with the prescription to the CBHI scheme), and failure to follow the required procedure results in a rejection of their claims by the scheme, leaving the members highly dissatisfied [24].

2.2.4. Management of insurance-related risks

Continuous monitoring enhances understanding of the degree and nature of insured risk events, helps in identifying moral hazards, and minimizes adverse selection [68]. Several studies revealed that moral hazard and adverse selection are common in CBHI schemes as elaborated below.

2.2.4.1.1. Moral hazard

Moral hazard is the extra health care that people buy when they get insurance. These additional health care purchases are considered inefficient by health economists. In this situation, the only way to increase the utility of one person is at the expense of the utility of society. A new theory,

however, contends that a large portion of the moral hazard in health insurance is actually efficient. A sizable part of moral hazard-related health spending is a welfare gain to society, not a loss [91]. Moral hazard is a major threat to the financial sustainability of health insurance schemes. The higher claims expenditure is attributed in part to the moral hazard behaviors of service providers and scheme members [72]. A qualitative study in Ghana reported that insured persons visit health facilities more frequently compared to non-insured. They also visit health facilities for minor illnesses, visit different facilities with the same condition within the same period to acquire more medications, and even some who are not sick visit the health facilities to collect drugs to store at home before their card expires [31]. Other moral hazard behaviors include collecting medicines for uninsured relatives or friends by explaining their symptoms and handing their cards to sick relatives or friends to attend a health facility for free treatment [31, 60, 81]. Another issue of worry was the sale of medicines by insured clients. This is a situation in which a subscriber visits more than one health facility with the same sickness at the same time to collect medicines for sale [60].

Some provider payment mechanisms like fee-for-service reimbursement give incentives for the provision of unnecessary and expensive treatment to insured patients, implying that moral hazards could also emanate from the provider side. Service providers' behaviors that constitute moral hazards include overprescribing, overcharging for drugs and services provided to clients, charging for services not provided, as well as inflating the number of clients provided with services [31].

According to the evaluation result of the pilot schemes in Ethiopia, both patient and service provider moral hazard behaviors were identified. Moral hazard behaviors on the part of patients include requesting unnecessary diagnostics, injections, and prescriptions; asking for drugs for their children in their absence, asking for a referral before using the services, and returning to the facility before completing the prescribed medicines and asking for another treatment. Service provider moral hazard behaviors include over-prescription of services including medicines and diagnostics; prescribing medicines with similar effects at the same time; prescribing the same medicine repeatedly, although it is not helping the patient; unnecessary referral to private wings, private clinics, or pharmacies to receive a “kickback” [24].

2.2.4.1.2. Adverse selection

Adverse selection refers to the tendency for individuals with greater needs for health services to join a health insurance scheme, as the benefits for such individuals in joining are greater than for

those with more limited health care needs. It puts a greater strain on the financial viability of the scheme as premiums become insufficient to cover the health care cost of the higher-than-anticipated demand [32]. Adverse selection is a key concern for any voluntary health insurance program [33]. Studies in China revealed that adverse selection was widespread in voluntary health insurance schemes [92, 93]. In India, people with greater health care needs (those with chronic conditions) were more likely to have health insurance coverage as compared to people with low health care needs or low-risk individuals [94]. In Ghana, scheme members were more likely to be in high-risk age groups which include children under the age of five and individuals over the age of 65. These groups have significantly higher per-member health costs than those in the middle of the age range. Members who remained in the scheme used more medical services than those who dropped out [72]. A study in Senegal reported that adverse selection was one of the main reasons behind the poor financial performance of many mutual health organizations [32].

As explored by qualitative studies, those who did not fall sick and did not utilize health services feel that there are no benefits in paying for membership. People preferred not to renew their policy because they had not fallen sick often [78-80, 84, 86] and they did not benefit from the scheme through service utilization [78, 79, 84, 86]. For example, one respondent in Ghana stated that *“It is painful when you don’t use the insurance card but have to renew it every year”* [80]. A participant in Uganda expressed his regret as follows: *“It hurts when one does not fall sick and utilize his contributions; for there are no benefits”* [78].

In Ethiopia findings suggestive of adverse selection have been reported by different studies. Households with poor self-rated health status [37, 38] and those having a member with chronic disease were more likely to enroll in the CBHI scheme [38-40].

2.2.5. Quality of health care

The development of CBHI must go hand in hand with gradually improving the quality of health care [34, 90]. To build sustainable CBHI schemes, members must perceive the benefit of the health services provided through the health insurance coverage to be better than that they receive without being insured [90]. A sustainable health insurance system highly depends on the quality of health care [95, 96]. Clients’ positive experiences with the quality of health care providers under insurance schemes increase their trust in the health system and insurance schemes [43, 95]. This in turn enhances the utilization of health care and their decisions to participate in health insurance

schemes [87]. However, the poor quality of health care services is an important problem threatening the sustainability of many CBHI schemes [34, 61].

2.2.5.1. Overall perceived quality of health care

A systematic review of factors that affect the uptake of CBHI in LMICs reported that the quality of health care was a key factor that influences participation in the scheme. People who perceived the quality of care as good were more willing to pay than those who perceived it as poor [97]. Following the introduction of a mutual health organization in Guinea-Conakry, the poor quality of care offered at the public health centers was the main reason for the decline in subscriptions to the scheme. Both members and non-members were dissatisfied with the quality of care offered [98]. Two comparative cross-sectional studies in Ghana reported that the perceptions of the quality of care by the insured were significantly more negative than the uninsured, and those of the previously insured were significantly more negative than the never insured. This demonstrates that a client's perceptions of health care quality can be influenced by their experiences at health care facilities, where insured and uninsured patients may be handled differently. Health insurance then became less appealing as a result of the negative perception of the quality of health care provided to insured clients [95, 99]. Contrary to this, a community-based study on clients' satisfaction with health services provided under CBHI identified that the clients were highly satisfied with the health services. Most of the clients were satisfied with the reception of the services and welcomed as they expected [100].

In Ethiopia, the perceived quality of health care provided by CBHI contracted public health facilities has a significant association with participation in CBHI. The perceived quality of health care in public health facilities was significantly higher for CBHI participants than for non-participants [35, 38]. In general, both insured and uninsured study participants criticized the quality of available services and indicated that several public health facilities lack the necessary laboratory equipment and medicines to satisfy the needs of scheme members [35].

2.2.5.2. Availability and perceived quality of medicines

Medicines are a critical component of quality service and their shortage in health facilities increases dissatisfaction among insured patients. Unavailability of medicines at service provider facilities or accredited pharmacies is a common problem encountered by insured patients, which forced them to buy from private pharmacies and make unnecessary payments [35, 79, 101-103].

Studies in Ghana and Nigeria showed that the perceived availability of prescribed medicines is significantly higher for uninsured patients compared to the insured [99, 104].

A study that compared two districts based on membership enrollment status in Tanzania identified the availability of medicines in the health facilities as one important factor for scheme performance. Frequent medicine stock-out was evident in health facilities located in the low-performing districts whereas better availability of medicines was found in the high-performing districts concerning membership enrollment [105]. In Ethiopia, the quality of health care, particularly the availability of most needed medicines in public facilities affects households' decisions on whether to enroll or renew [74, 106].

The perceived poor quality of medicines was regarded as a major impediment by both subscribers and non-subscribers. Non-subscribers stated that the low quality of medicines provided to subscribers was one of the main reasons for their lack of interest to join the scheme [81, 107]. In another study, the insured who were served with generic medicines perceived the quality of care they received as low [95]. On the contrary, another study identified that the majority of the respondents perceived the medicines prescribed to them were effective [87].

2.2.5.3. Waiting time at health facilities

The length of time that patients spend receiving health care has received greater attention. More importantly, the introduction of CBHI schemes is associated with an increase in patient load which results in longer waiting times [103]. Long waiting times result in dissatisfaction among clients [108] and could discourage continuity of service utilization [103]. The insured who experience long delays perceived the quality of care they received as low [95]. Many studies on health care quality have reported poor service delivery concerning long waiting times [61, 79, 81, 109, 110]. In Ethiopia, a long waiting time to see a health care professional was one of the deterrent factors to enrollment in the CBHI scheme [35, 74]. Comparative research findings reported that long waiting times tend to affect insured clients more than the uninsured. Insured patients perceive waiting time to be longer compared to the uninsured with a statistically significant effect [99, 111].

2.2.5.4. Attitudes and behaviors of health care providers

The negative attitude of HCPs toward insurance subscribers has been noted as a major concern in the implementation of community health insurance schemes. The high attendance and perceived

service abuse by the insured had led to an increased workload. Increased workload influences the behavior of HCPs towards insured patients [74]. Studies have shown that insured patients perceived and experienced verbal abuse, and discrimination from the HCPs in favor of the uninsured [35, 61, 79, 81, 99, 101, 112, 113].

An atmosphere of disrespect, carelessness and ineffective manner of dealing with patients' cases was reported as the main implementation challenges of CBHI in Rwanda. This includes bitterness and irritating conversation with patients, failure to assist patients, absenteeism from the workplace by nurses, and waiting in a queue without any information update [112]. A comparative study in Burkina Faso showed that HCPs conduct quality diagnostic exams and provide sufficient time for the non-insured group compared to the insured group. The diagnostic care provided to insurance enrollees was significantly less comprehensive than care provided to non-enrollees. The HCPs were less likely to measure weight, take temperature, use a stethoscope, physically examine the patient, and inform the patient of examination results [113]. In another study, insured patients perceived that there is unequal treatment of insured and uninsured patients; and an unfair queuing system both favoring the uninsured [99].

In Ethiopia, a qualitative study revealed that HCPs did not provide equal services and respect for insured and uninsured patients. Medicines are not available for insured patients and the providers did not treat insured patients properly believing that most insured people come to the health facility with minor medical cases since they do not pay for services during facility visits [35].

Contrary to these findings, other studies in Bangladesh and Ghana reported that there is no significant difference between the insured and uninsured respondents concerning perceptions of fairness of health care [87, 100, 111]. They expressed their satisfaction concerning the examination by a doctor or medical assistant, being informed about prescribed medicines, diagnostic tests, and their illness, having privacy during consultations, the skill of service providers, and respect for clients' views [87, 100].

2.2.5.5. Factors associated with perceived quality of health care

The literature documented some factors linked to the perception of the quality of health care, both at the individual and system levels. The age of the respondents has a significant association with perceptions of quality of care. The higher the age, the more favorable perceptions of the quality of care [111, 114, 115]. Concerning economic status, a higher wealth quintile was associated with

a reduction in the perceived quality score according to a study in Ghana [95]. The perceived health status also had a positive and significant relationship with the perceived quality score [111, 116].

The perception of the quality of care varies based on health insurance status. Previous experience with health insurance is associated with low rating on the perceived quality of health care. A study in Ghana showed that previously insured clients had a higher perception of quality of care compared to actively insured clients (statistical significance is not reported) [99]. Another study showed that insurance members with four or more years of enrolment in the scheme were less likely to rate their perception of quality of care as good compared to those with less than a year of enrolment [114]. Contrary to this, a study in Burkina Faso showed that health insurance enrollment had a significant and positive association with patient satisfaction with the quality of care [113].

The literature also documented some cluster-level variables associated with patients' perceptions of quality of care. Overcrowding was found to be a cluster-level variable that was negatively associated with clients' perceptions of quality of care in a study conducted at public hospitals in China [117]. A study in Ethiopia identified a non-linear significant association (an inverted U-shape) between patient volume and quality. Quality decreased with increasing patient volume in health facilities that treated 90.6 or more patients per day, while quality increased with increasing patient volume in health facilities that treated less than 90.6 patients per day in the outpatient departments [118]. Staff job satisfaction is also linked to the perceptions of quality of care. A study in Finland reported a positive relationship between job satisfaction among the nursing staff and patients' perceptions of quality of care [119].

2.2.5.6. Measurement of health care quality

Quality of health care that is effective, safe, and people-centered is recognized as a key determinant of better health outcomes. Increasing access to essential health services without efforts to improve their quality cannot bring the desired health outcomes for the population [9, 10, 12]. The quality of UHC-funded health care must be assessed regularly to promote optimal utilization, stable finances, and better outcomes [13].

With a few modifications on the Institute of Medicine's health care quality dimensions, the report of the National Academies of Sciences, Engineering, and Medicine outlined six dimensions of quality of care that apply to low-resource settings and modern times. These dimensions are safety;

effectiveness; person-centeredness; timeliness, accessibility, and affordability; efficiency; and equity [12]. To drive improvements in the quality of health care, measurement of quality with a focus on each of these dimensions is imperative [9, 12].

Despite there being an agreement on the value of the above attributes of quality, providers, patients, managers, and payers attach varying levels of importance to each attribute and thus define the quality of care differently. Health professionals tend to perceive the quality of care foremost in terms of technical performance whereas patients are more likely to emphasize the importance of patient-centeredness, amenities, and reputation [120]. The emphasis has shifted from measurement systems that are focusing on health professionals to truly people-centered systems in which measurement is focusing on experiences and outcomes viewed from the perspective of patients [9, 10, 12, 121].

People-centeredness is considered a core quality component that is inherent in the other domains of health care quality [122]. In many countries of the Organization for Economic Co-operation and Development (OECD), measures of patient experience have received more attention and are widely used as quality measurement metrics [123], primarily to illuminate the quality of the dimensions of people-centeredness and timeliness [10, 121]. Patient experience is also positively associated with other more objective indicators of health care quality. It is positively and consistently associated with patient safety and medical effectiveness for a wide range of illness areas, contexts, outcome measures, and study designs [124]. A better patient experience is linked to better clinical results, patient safety, and adherence to prevention and treatment recommendations, as well as less resource wastage in hospitals [124, 125]. A better patient experience is also positively associated with the technical quality of care delivery and fewer adverse events [124]. It is the primary driver of the outcomes central to healthcare organizations: clinical outcomes (safe, high-quality care), financial outcomes, consumer loyalty, and community reputation [126].

Patient experience is a reflection of the patient journey, which consists of the myriad interactions patients have with health care providers and the healthcare system over time and in a variety of settings. It is shaped by the health care team, the organization, and the surrounding policy and regulatory environment. A negative patient experience is a proxy for a larger health system failure, underscoring the need to apply systems thinking to improving health care quality [12, 16]. The patient experience metric is an important quality assessment tool that is widely used to inform

quality improvement, pay-for-performance payments, and accountability to patients and the public [123]. The OECD included patient experiences with ambulatory care as a core set of indicators of health care quality [127]. In Ethiopia, measuring and reporting on patient experience is a key indicator as part of the country's health care quality transformation efforts [128].

Patient experience is defined as “the sum of all interactions, shaped by an organization's culture, that influence patient perceptions across the continuum of care”[129]. It is a multidimensional construct that includes health care elements like the cleanliness of facilities, physical comfort, waiting times, communication with health providers, the information provided, involvement in decisions, and emotional support [130, 131]. Patient experience surveys elicit information on the transactional aspects of care, which are process-related, and relational aspects of care, which are the interpersonal interactions that take place during the care [132]. Service users are asked about their experiences of a health facility encounter to report whether or not certain processes or events really occurred [133]. The focus of the patient experience instruments is related to the perceived quality of health care services, which is primarily composed of experience attributes in various domains that can be judged by patients [134, 135].

Several patient experience measures have been developed for use in assessing general health facility encounters or experience with specific services or disease conditions most of which are in higher-income countries. The Consumer Assessment of Healthcare Providers and Systems (CAHPS) and the Picker Patient Experience Questionnaires have gained popularity to assess hospital encounters of patients, and have been used as a guide for developing patient experience surveys in several OECD countries [123]. The Picker Patient Experience Questionnaire contains eight core domains including information and education, coordination of care, physical comfort, emotional support, respect for patient preferences, the involvement of family and friends, continuity and transition, and overall impression [136], while areas of measures in CAHPS include communication with nurses, communication with doctors, the responsiveness of hospital staff, communication about medicines, discharge information, care transition, cleanliness and quietness of the hospital environment, hospital rating, and hospital recommendation [137].

2.3. Conceptual framework

The conceptual framework in Figure 1 below integrates concepts based on a review of the literature on the performance and sustainability of health micro-insurance schemes, membership

renewal, and perceived quality of health care. Many factors influence the sustainability of a CBHI scheme, and it would be too difficult to consider them all. Hence, only the main factors that have a direct link to the sustainability of the CBHI scheme were considered in this study. The sustainability of the CBHI scheme was measured on three levels: financial, technical, and functional viability. Each of the three levels was analyzed using quantitative and qualitative indicators. Financial viability refers to the ability of the scheme to rely on its income to cover expenses over the long term. Its evaluation was based on indicators related to claims ratio, and net income ratio. The financial viability of CBHI schemes in part depends on the performance of the scheme in terms of the technical and functional perspectives. Technical viability involves an analysis of the extent to which the scheme manages health insurance-related risks: adverse selection and moral hazard. If the scheme fails to take appropriate measures to limit insurance-related risks, it will lead to excess claims ratio, and reduced net income (undermine the financial viability of the scheme). The evaluation of functional viability was based on indicators relating to the scheme's ability to attract (enroll) and retain members to increase the overall membership growth ratio, and the efficiency with which the scheme pays health providers or reimburses scheme members. The trend in the growth ratio is usually an important indicator of the success of voluntary schemes over the period in question. The results of the slow growth rate threaten the financial viability of the scheme. Both high and low claims rejection ratios indicate weak administration. A low claims rejection ratio may indicate the inability of the claims review system to detect unnecessary or fraudulent claims and this results in a high claims expense, while a high rejection ratio harms the coverage, renewal, and growth ratios because members develop a negative perception towards the scheme. Promptness of claims settlement indicates the ability of the scheme to pay service providers within agreed time limits. A prolonged payment period may result in a decline in the quality of care provided, a lack of confidence on the part of service providers, and subsequently, a decline in membership renewals due to unsatisfactory health care.

Membership renewal is dependent on scheme-related factors including members' trust in the scheme management, their value towards solidarity, and perception of the ability of the CBHI scheme to protect members from financial risks. It also varies based on individual and household level factors including the age, gender, marital status, and educational level of the household heads; wealth status; household size, and participation in a safety net program. Similarly, the existence of chronic illness in the household, history of hospitalization under the scheme,

perceived health status, and the perceived quality of health care may influence the households' decision to continue as scheme members.

The perceived quality of health care can be influenced by both individual and household level factors including the age, gender, marital status, and educational level of the household heads; wealth status; perceived health status, and insurance status. The literature also indicated that clients' perception of health care quality varies based on facility-level factors. These include patient flow, providers' work experience, job satisfaction, and organizational commitment.

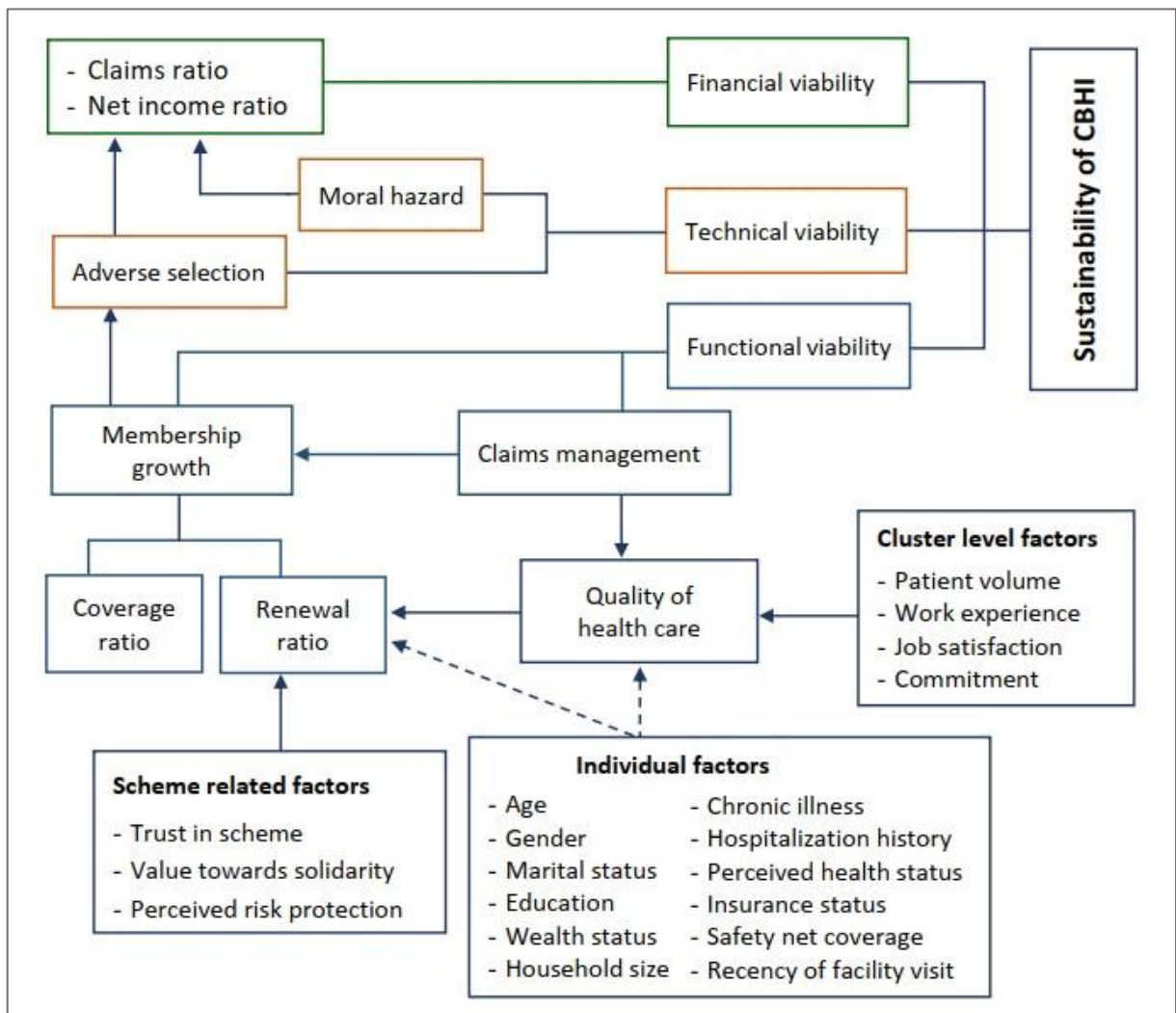


Figure 1: The conceptual framework to investigate the sustainability of the CBHI scheme which is developed based on a review of the literature.

3. RESEARCH QUESTIONS

- What is the average time to drop out of a CBHI membership?
- Is the time to drop out of CBHI membership significantly associated with economic status, household size, chronic illness experience, inpatient service use, perceived quality of health care, perceived risk protection, trust in the scheme management, and value towards solidarity?
- How is the health care quality provided by CBHI affiliated health facilities perceived by active and ex-members of the scheme?
- Is there a significant difference in perceived health care quality among health facilities due to difference in health care providers' work experience, organizational commitment, job satisfaction, and patient volume?
- How is the CBHI scheme performing in terms of membership coverage, retention of members, claims expense, and claims settlement?
- What challenges pose a threat to the performance of the CBHI scheme in terms of membership development and financial viability?

4. STUDY OBJECTIVES

4.1. General objective

- To investigate the sustainability of CBHI scheme and underlying challenges in two districts of northeast Ethiopia.

4.2. Specific objectives

- To measure the time to drop out of CBHI membership and associated factors among households who have ever been enrolled in the scheme in two districts of northeast Ethiopia.
- To examine the perceived quality of health care and associated factors among households who have ever been enrolled in the CBHI scheme in two districts of northeast Ethiopia.
- To examine the enrollment trends, and explore the challenges that underpin membership growth of the CBHI scheme in two districts of northeast Ethiopia.
- To evaluate the financial viability and explore challenges impeding the financial performance of the CBHI scheme in two districts of northeast Ethiopia.

5. MATERIALS AND METHODS

This chapter outlines the methodological approaches used in carrying out the thesis. The study includes both qualitative and quantitative approaches and the methods used for each are elaborated. It describes the study area and population, the research design, study variables with their operational definitions and measurements, sample size and selection, research instruments and data collection approaches, and data analysis. Ethics issues and procedures to assure data quality are also described.

5.1. Study area and period

The study was conducted from February 04 to May 2, 2021 in two rural districts of South Wollo Zone in northeastern Ethiopia: Tehulederie and Kallu. South Wollo is one of the 11 zones in the Amhara Regional State. Dessie, the capital city of the Zone is located 480 km east of Bahir Dar, the capital city of the Regional State, and 400 km northeast of Addis Ababa, the capital city of Ethiopia. The population of South Wollo was estimated to 3.10 million in 2020, with 88% residing in rural areas. According to the Zonal Health Department report of 2020, there are 11 public hospitals (one referral, one general, and nine primary hospitals) and 135 health centers that provide health services to people in the zone and the surrounding areas. In the zone, there are a total of 608,292 households that are eligible for CBHI membership, of which 67.7% are active scheme members as of the 2020 enrollment [138]. Administratively, the zone is divided into 22 districts.

Tehulederie is located 30 km northeast of Dessie city. Administratively, the district is divided into seven urban and 20 rural *Kebeles* (subdistricts). In the district, there are five health centers and one primary hospital. Based on projections from the 2007 population and housing census of Ethiopia, there is an estimated total population of 145,625 residing in 33,866 households, among which 87.50% are from the rural areas. Tehulederie was one of the CBHI pilot districts in Ethiopia, which began implementing the scheme in July 2011. There are 22,678 CBHI eligible households of which 60.2% were covered by the scheme in 2020 [138].

Kallu is located 50 km southeast of Dessie city on the highway to Addis Ababa. The district is divided into four urban and 36 rural *Kebeles*, and it has nine health centers. With a population of 234,624, it is the zone's most populous district, of which 89.11% are living in the rural areas. There are 54,564 households in the district among which 46,924 are eligible for CBHI membership. In Kallu, the CBHI scheme was launched in July 2013. The CBHI membership coverage was 60.8% as of June 2020 [138]. Agriculture is the main source of income for the majority of the population in the study areas.

5.2. Continued adherence to CBHI membership (Objective I)

5.2.1. Study design

A community-based cross-sectional study was employed.

5.2.2. Source and study populations

The source population was all rural households located in the study districts that have ever been enrolled in the CBHI scheme. This includes rural households that were active members at the time of the study and those who left the scheme at each renewal period starting from the initiation of the scheme in the selected districts. The study population was all households located in the selected rural *Kebeles* who have ever been enrolled in the CBHI scheme. The study focused on rural *Kebeles* because the scheme in urban *Kebeles* had a unique design, and was started recently, which makes it too early to evaluate its sustainability. Since CBHI membership is at a household level, data were collected and analyzed at the household level.

5.2.3. Eligibility criteria

5.2.3.1. Inclusion criteria

Households who have ever been enrolled in the CBHI scheme were included in the study.

5.2.3.2. Exclusion criteria

Households with less than one year of CBHI membership were excluded from the study as they are not at risk of dropping out. Non-paying scheme members were excluded from the study since such members have no incentive to drop out of the scheme, the inclusion of which could have a confounding effect on the association between economic status and the time to drop out. This is because the financial barrier to join or continue as scheme member is removed via fee waiver.

5.2.4. Study variables

5.2.4.1. Dependent variable

The outcome variable was the time to drop out of the CBHI membership since joining the scheme and was measured in years. The event of interest was dropping out of the scheme.

5.2.4.2. Independent variables

The independent variables for this study include age, gender, education, and marital status of the household head; household size; wealth status; participation in a safety net program; perceived health status; the presence of chronic illness in the household; history of hospitalization under the scheme; perceived quality of health care; perceived financial risk protection; trust in the scheme and value towards solidarity. These variables were selected based on the findings of a systematic review. Initially, we conducted a systematic review of the factors that influence CBHI membership renewal in low- and middle-income countries [139].

However, some important factors influencing the renewal decision of CBHI members including place of residence, distance to the nearest health facility, recent episodes of illness, use of health care under the scheme, frequency of health facility visit, and benefit claims experience were excluded from this study. Because the whole population of interest lives in a rural setting, the place of residence was not taken into account in this study. Distance to a health facility is an important variable linked to renewal decisions. However, it was omitted in this study since it was considered as a *Kebele* level variable that might be handled by the frailty analysis as unobserved characteristics (assuming people in the same *Kebele* are located nearly at the same distance to the health facility). We did not include recent illness episodes as an independent variable since we believed it could not impact previous dropout decisions.

During the pretest, we attempted to gather data on the frequency of health facility visits, usage of health care under the scheme, and benefit claims experience. However, we were unable to get meaningful data due to recall bias. Furthermore, we sought to obtain the yearly average health facility visits and benefit claims from the membership registration files of the schemes. We also failed to obtain the necessary data in this area owing to incomplete recordings. As a result, we decided to omit these factors from the study.

5.2.5. Variable measurement and operationalization

- The **time to dropout** refers to the period that member households remain in the scheme without interruption and was measured in years. Households which leave the scheme following their initial enrollment were categorized as dropouts.
- **Participation** in a safety net program refers to being covered by a program catering to food-insecure households.

- **Wealth index** was generated using the principal component analysis method. The scores for 15 types of assets and utilities were translated into latent factors and a wealth index was calculated based on the first factor that explained most of the variation [140]. Based on the index, the study households were categorized into low, medium, and high wealth tertiles.
- **Current marital status:** Classified in the categories of married and unmarried. The term “married” encompasses all currently married people, while “unmarried” includes those who are divorced or widowed.
- **Perceived health status** was measured based on a household head’s subjective assessment of the health status of the family and was rated as “excellent, very good, good, fair, or poor” [123]. However, for analysis purposes, it was re-categorized into fair, good, and very good, by merging the two extreme response categories with few frequencies to the next categories.
- The presence of **chronic illness** refers to one or more members of the household having a known chronic illness that requires ongoing medical attention and being informed by a HCP.
- **History of hospitalization** was measured by asking the respondents whether or not any member of the household stayed at least for one night in a hospital to receive medical care.
- **Perceived quality of health care** was measured on a Likert scale by asking respondents to rate the extent to which they agreed on nine patient experience questions regarding the health services they received from the nearby CBHI-affiliated health centers. Items that appear to be less prone to recall bias were selected from the instrument used to measure the outcome variable of the second study objective, which is detailed under 5.3.3. The scores for the nine items were translated into three dimensions, and a health care quality index was created based on the first dimension that explained most of the variation. Finally, the health care quality index was categorized into tertiles and labeled as low, medium, and high.
- **Perceived financial risk protection** is the perception of scheme members towards the ability of the CBHI to protect subscribers from financial losses. It was measured using three items, which include the scheme being able to protect members from OOP health care expenses, selling their important assets, or borrowing money at the time of receiving health care.
- **Trust in the scheme** refers to the level of faith that individuals put on the overall management of health insurance. A four-item trust measurement scale was adapted based on a previous tool validated and used in Cambodia [82].

- **Value towards solidarity** refers to the extent to which individuals give worth to the principle of solidarity or mutual support. A three-item tool was adapted from a previous study conducted in Senegal to measure value towards solidarity [141].
- Perceived financial risk protection, trust in the scheme, and value towards solidarity were measured on a Likert scale by asking respondents to rate the extent to which they agreed on a set of items designed for each variable. An overall index was calculated from the set of items using factor analysis, and a three-level categorical variable labeled as “low, medium, and high” was created using tertile points for each of the three variables.

5.2.6. Sample size and sampling methods

The sample size was calculated using MedCalc 20 software via the log-rank test, which compares the survival rates of two independent groups. Due to the absence of previous studies on CBHI that could be used as an input for sample size calculation in survival analysis, a survival rate of 0.50, which yields an adequate sample size was assumed for the unexposed group. The survival rate in the exposed group was set to 0.60 to achieve a power that yields an effect size of 0.2037, which is the smallest recommended effect size for calculating an adequate sample size [142]. Hence, it was assumed that there is a binary variable that divides the sample population into two equal groups with survival rates of 0.50 in the unexposed group and 0.60 in the exposed group, 80% statistical power, and 95% confidence level. Based on these assumptions, a sample size of 762 was calculated. Considering a design effect of 1.5 attributed to the use of a multistage sampling and a potential non-response rate of 10%, the effective sample size was estimated to be 1257 households.

The study participants were recruited using a three-level multistage sampling method. As illustrated in Figure 2, First, 12 clusters of *Kebeles* organized under a health center catchment area were selected. Then, 14 rural *Kebeles* were drawn randomly using a lottery method proportional to the number of *Kebeles* under each cluster. Accordingly, five *Kebeles* from Tehulederie and nine from Kallu were included. A list of households who have ever been enrolled in the CBHI scheme was obtained from the membership registration books of each *Kebele*, and these lists were used as the sampling frame. Then, 1257 households were drawn randomly using a random number generator software from the selected *Kebeles* proportional to the total number of households ever enrolled in the scheme.

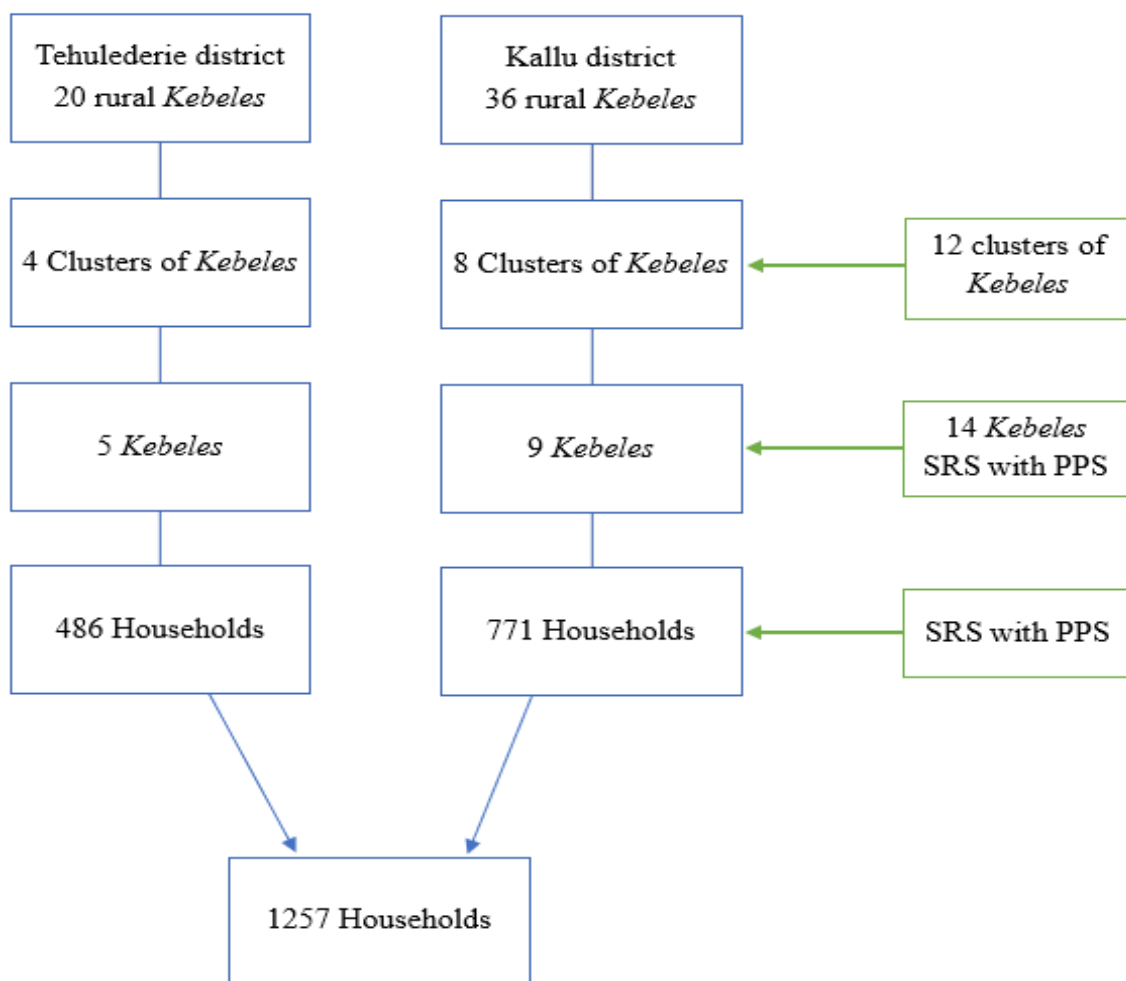


Figure 2: Schematic representation of the sampling procedures for household surveys.

5.2.7. Data collection

Household-level data were collected from 04 February to 21 March 2021 by trained data collectors using a structured interviewer-administered questionnaire. Information related to membership duration and membership status for each household was obtained from the membership registration book at each *Kebele* (health post) and was confirmed using membership cards during data collection. Ten years of follow up data were obtained starting from the initiation of the CBHI scheme in 2011 to the end of 2020, after which complete renewal data were not available.

Information related to socio-demographic characteristics of the household, health status, value towards solidarity, perceived financial risk protection, trust in the scheme, and perception of respondents towards health care quality were collected at the household level through face-to-face interviews. The heads of the households were interviewed at their home using the local language;

Amharic. A household was considered a non-respondent if the head of the household was not willing to participate in the interview or was absent after a revisit by the data collectors. To track the sampled households, the data collectors were guided by health extension workers and/or *Kebele* administrators who are well aware of the participants' addresses. The Open Data Kit (ODK) mobile data collection platform was used for the household survey. The data collectors submitted the completed forms to the online aggregator (Kobo server) daily, which helped us to review the daily submissions and facilitate the supervision process.

Before the data collection, the questionnaire was pre-tested on a sample of 84 randomly selected participants in one *Kebele*. As part of the pre-test, a cognitive interview was conducted on selected items using the verbal probe technique among eight respondents to determine whether or not items and response categories were understood and interpreted by the study participants as intended. Accordingly, the wording of some items and response options were revised and some items were removed.

Five data collectors who are well-versed in the health system and the health insurance scheme were recruited for the household survey. We recruited three health care providers with more experience in providing health services and two experienced individuals who are currently employed as disease surveillance data collectors. Health care providers were selected from health facilities outside the study areas to minimize the possibility of both interviewer and social desirability bias particularly with respect to the perception of the quality of care.

5.2.8. Data quality assurance

The data collectors and supervisors were trained to have a clear understanding of the data collection software, the instruments to be used, and how to approach the respondents. Before data collection, the principal investigator communicated with the managers of the sampled *Kebeles* and health extension workers (HEWs) to ensure good cooperation.

A pre-test was conducted in one *Kebele* to familiarize data collectors with the procedures to be conducted in the actual fieldwork and to have some modifications of the tools based on the local situation. A cognitive interview was conducted as part of the pre-test on selected subjective items to determine whether or not items and response categories were understood and interpreted by the study participants as intended. The pre-test setting was selected among *Kebeles* in Tehulederie district, which was out of the study *Kebeles*. Factor analysis was performed to check the validity of some

composite variables. By the time of data collection, the purpose of the study was informed to the respondents to get accurate data. The use of ODK collect software helps to improve the quality of the data, as it allows built-in checks and skip patterns.

5.2.9. Data management and analysis

The data which was stored in the online data aggregator (Kobo server) was downloaded, organized, cleaned, and edited using MS Excel spreadsheet. Then, it was exported to Stata version 17 for statistical analysis. Descriptive summaries such as frequencies, percentages, mean, and standard deviations of different variables were determined. Exploratory factor analysis was performed to assess the validity of the questionnaires designed to measure value towards solidarity, perceived financial risk protection, trust in the scheme, and perceived quality of health care. Bartlett's test of Sphericity and the Kaiser-Mayer-Olkin's (KMO) measure of sampling adequacy tests were performed to assess the appropriateness of the data for factor analysis. Items with insignificant loadings and low communality (both below 0.40) and items with cross-loading were removed from the analysis. The Eigenvalue greater than one decision rule was used to determine the appropriate number of factors to be extracted. The reliability of measurement scales was estimated by measuring the internal consistency of each of the dimensions using Cronbach's alpha, with an acceptable alpha value of 0.60 or higher [143].

The total membership years of follow-up with an average follow-up time and the annual dropout rate were computed. The time to drop out of a CBHI membership was described using the Kaplan-Meier (KM) estimate. To identify the variables associated with the time to drop out of CBHI membership, a univariate analysis was performed by fitting separate models for each variable before proceeding to the multivariable analysis. Variables that were significant in the univariate analysis at a p-value of less than 0.20 were included in the multivariable analysis [144]. The multivariable analysis was done using the accelerated failure time (AFT) shared frailty models.

The classical Cox proportional hazard model, which is commonly used to analyze survival data, assumes that the ratio of the hazards between any two individuals is constant over time. However, in many applications, the study population cannot be considered homogeneous. In this study, the time to drop out of a CBHI membership is assumed to be different between clusters (*Kebeles*) due to variations in the performance of the *Kebele* health insurance team, which is mainly responsible for retaining scheme members. The intra-cluster correlation is assumed to be due to unobservable

covariates specific to the cluster. One approach to account for such unobserved heterogeneity is the use of a shared frailty model, which introduces a random effect into the model that induces dependence within clusters. In a shared frailty model, individuals in a cluster are assumed to share the same frailty value [145].

Frailty is an unobservable random effect shared by subjects within a cluster. It acts multiplicatively on the hazard. When a shared frailty term with a Weibull distribution is assumed, the hazard function at time t for the j^{th} individual, $j = 1, 2, \dots, n_i$, in the i^{th} group, $i = 1, 2, \dots, g$, is given by:

$$h_{ij}(t) = z_i \exp(\beta' x_{ij}) \rho t^{\rho-1}, \quad (1)$$

Where x_{ij} is a vector of explanatory variables for the j^{th} individual in the i^{th} group, β is the vector of regression coefficients, $\rho t^{\rho-1}$ is the baseline hazard function, ρ a shape parameter and the z_i are frailty effects that are common for all n_i individuals within the i^{th} group [146]. The hazard function can also be written in the form:

$$h_{ij}(t) = \exp(\beta' x_{ij} + u_i) \rho t^{\rho-1}, \quad (2)$$

where $u_i = \log(z_i)$. The corresponding survivor function for a Weibull model that incorporates a shared frailty component is:

$$S_{ij}(t) = \exp\{-\exp(\beta' x_{ij} + u_i) t^\rho\}, \quad (3)$$

The frailty is generally assumed to follow a gamma or inverse-Gaussian distribution with a mean equal to 1, and variance θ which is estimated from the data. The estimate for the variance parameter θ in a shared frailty model can be thought of as a measure of the degree of correlation, where $\theta > 0$ indicates the presence of heterogeneity. Large values of θ reflect a greater degree of heterogeneity among clusters and a stronger association within clusters [146].

The AFT models are parametric models that provide a useful alternative to the commonly used proportional hazards models in survival analysis owing to the ease of interpretation. In addition, the regression parameters in AFT models are robust toward omitted covariates unlike that of the proportional hazards models [147]. The AFT model is a general model for survival data in which explanatory variables measured on an individual are considered to act multiplicatively on the timescale. It allows researchers to measure the direct effect of predictor variables on survival time.

In contrast to the proportional hazards model, the AFT model can best be interpreted in terms of the survival function [148]. The AFT model is defined by the relationship:

$$S_I(t) = S_0(t/\delta), \text{ for } t \geq 0, \quad (4)$$

Where δ is a constant called the acceleration factor, which tells the researcher how the change in the value of the covariate changes the time scale relative to the baseline time scale. The acceleration factor is the ratio of the survival time corresponding to any fixed value of $S(t)$. In the regression framework, the acceleration factor δ can be parameterized as $\exp(\alpha)$, where α is the parameter to be estimated from the data. With this parameterization, the general form of the survivor function for the i^{th} individual in an AFT model is:

$$S_i(t) = S_0\{t/\exp(\alpha'x_i)\}, \quad (5)$$

In this version of the model, $\exp(\alpha'x_i)$ is the acceleration factor for the i^{th} individual.

The general parametric AFT model that incorporates a shared frailty component is of the form:

$$S_{ij}(t) = S_0\{t/\exp(\eta_{ij})\}, \quad (6)$$

Where $\eta_{ij} = \alpha'x_{ij} + u_i$, and $\exp(\eta_{ij})$ is the acceleration factor for the j^{th} individual in the i^{th} group. This model can be expressed in log-linear form as:

$$\log T_{ij} = \mu + \alpha_1 x_{1ij} + \alpha_2 x_{2ij} + \dots + \alpha_p x_{pij} + u_i + \gamma \epsilon_{ij}, \quad (7)$$

Where T_{ij} is the random variable associated with the survival time of the j^{th} individual in the i^{th} group, μ and γ are intercept and scale parameters, respectively, and u_i 's are the cluster-specific random effects. The quantity ϵ_{ij} is a random variable used to model the deviation of the values of $\log T_{ij}$ from the linear part of the model, and ϵ_{ij} is assumed to have a particular parametric distribution [149]. In this formulation of the model, the α -parameters reflect the effect that each explanatory variable has on the survival times; positive values suggest that the survival time increases with increasing values of the explanatory variable and vice versa.

The common baseline distributions of the AFT models include exponential AFT, Weibull AFT, log-logistic AFT, and lognormal AFT distributions. Akaike's Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used for model comparison. The overall fit of the final AFT model was checked by using the Cox-Snell residuals plot. Finally, the variance of the random effect (θ), the regression coefficients, and the acceleration factor (δ) with a 95% CI were estimated.

5.3. Perceived quality of care (Objective II)

Since the first and second studies applied some similar methodological approaches, sub-sections including the study design, study populations, sampling methods, data management, and data quality assurance techniques are omitted under this section to avoid redundancy.

5.3.1. Eligibility criteria

In addition to what has been stated under 5.2.3, households who did not use health care in the past 12 months prior to the data collection were excluded from this study to minimize recall bias.

5.3.2. Study variables

5.3.2.1. Dependent variable

The dependent variable of interest for this study was the perceived quality of care (PQoC) score, which was treated as a continuous variable.

5.3.2.2. Independent variables

- *Individual-level variables:* age, gender, education, and current marital status of the household head; wealth status; household size; current health insurance status; perceived health status; the presence of chronic illness in the household, and recency of health center visit.
- *Health facility level variables:* average work experience, organizational commitment and job satisfaction of HCPs, and patient volume.

5.3.3. Variable measurement and operationalization

In addition to the terms operationalized under sub-section 5.2.5, the following definitions were used for the PQoC survey.

- The **Perceived quality of health care (PQoC)**, which is the outcome variable of interest, is a composite variable that was measured using a 17-item Likert scale designed after a thorough review of validated tools [113, 117, 150-152]. Respondents were asked to rate the extent to which they agreed on a set of items relating to their experiences with the health services they received in the outpatient departments of the health center, that is the usual source of health care. Each item was designed on a 5-point response format, with 1-strongly disagree, 2-disagree, 3-neutral, 4-agree and 5-strongly agree. The summary scores for the PQoC and its dimensions

were calculated for individual respondents by adding the scores of each item. This gives a scale ranging from 17 (1×17) to 85 (5×17) for the overall PQoC score. For quality dimensions consisting of three and four items, the scale ranges from 3 to 15 and 4 to 20, respectively. When reporting the results, the scores were arithmetically transformed on a scale of 20 to 100 [153]. This allows the comparison of mean scores of PQoC, its dimensions, and each measurement item on a common scale.

- **Patient volume** was measured using the daily average number of patients managed by a HCP in the outpatient department. It was calculated by dividing the number of patients who visited the health center in the last six months before the study by the number of working days, and then by the number of consultation rooms in each health center [154].
- Organizational (affective) commitment and job satisfaction were composite variables, and were assessed using a Likert scale on a 5-point response format ranging from 1-strongly disagree to 5-strongly agree. Affective commitment was measured with a seven-item questionnaire based on a modified version of the Meyer et al. scale, which had previously been used in a hospital setup [155], while staff job satisfaction was measured using a 10-item scale, which was adapted from a study among health care workers in Ethiopia [156]. Average scores were computed for each health center and were treated as continuous variables.

5.3.4. Sample size determination

The sample size was calculated by assuming a mean difference between two independent groups. A previous study on PQoC reported mean scores of 5.2 and 5.4 with standard deviations (SD) of 0.8 and 0.7 among insured and uninsured respondents, respectively [113]. Using this output and assuming 80% power, 95% confidence level, and equally sized groups, a sample size of 446 was calculated. Considering a design effect of 1.5 attributable to multistage sampling and a potential non-response rate of 10%, the effective sample size was estimated to be 736 households. Since the data for the first and second studies was collected from the same study population, the largest sample size, that is 1257 was considered for both studies. Among those, 1081 eligible households participated in this study.

5.3.5. Data collection

Individual-level data were collected through face-to-face interviews with household heads at their homes or workplace using a structured questionnaire via an electronic data collection platform. The

data collectors submit the completed forms to a data aggregating server daily, which allowed us to review the submissions and streamline the supervision process.

Cluster-level data were collected from 12 health centers that provide health care for the population in the sampled *Kebeles*. Patient volume data were obtained by reviewing the monthly service delivery reports of health centers, while data related to work experience, affective commitment, and job satisfaction were collected through a self-administered questionnaire among 194 HCPs who worked more than one year in the current facility. All health professionals who were working at different health service delivery points were approached.

5.3.6. Data analysis

Data analysis was performed using Stata version 17. Descriptive summaries such as frequencies, percentages, mean, and standard deviations of different variables were determined. Exploratory factor analysis was performed to assess the validity of the quality measurement scale. Bartlett's test of Sphericity and KMO measure of sampling adequacy were performed to assess the appropriateness of the data for factor analysis. The principal component factor method of extraction and Promax rotation with Kaiser Normalization was used. The Eigenvalue greater than one decision rule was used to determine the appropriate number of factors to be extracted. Items with loadings and communalities both below 0.40 were removed from the analysis [143]. Correlation coefficients were used to test construct validity. Item-total score correlation, dimension-total score correlation, and dimension intercorrelation were computed. The total score was the mean score of the ratings for all items on the scale, and the dimension score was the factor score. A questionnaire has good construct validity when the item-total score correlations are higher than 0.40, dimension intercorrelations are less than 0.80, and dimension-total score correlations are higher than dimension intercorrelations [150]. Cronbach's alpha coefficients were generated for each dimension to assess the internal consistency. The reliability of the scale was considered acceptable if Cronbach's alpha coefficient was 0.60 or higher [143].

To compare the mean scores of PQoC and its dimensions among subgroups, an independent t-test and a one-way analysis of variance (ANOVA) with Tukey's post-hoc test were used. Because the outcome variable was considered a continuous variable, a multilevel linear regression model was fitted to identify associated factors. The PQoC was assumed to be influenced by the characteristics of households (individual-level variables) as well as the characteristics of health centers (cluster-

level variables). Cluster-level data were linked to individual-level data based on the usual source of health care for each study participant. Considering the hierarchical structure of the data, where patients are nested within health centers, a two-level linear regression model was applied. In this study, there were 12 health centers, hence the Restricted Maximum Likelihood estimation approach was employed because it is appropriate for smaller cluster sizes [157]. Four models were estimated to choose the one that best fits the data. The first model or the null model (a model without predictors) is given by:

$$Y_{ij} = \gamma_{00} + u_{0j} + \varepsilon_{ij} \quad (1)$$

The null model estimates three parameters: the average intercept (γ_{00}), the between health center error, or deviation, from the average intercept (u_{0j}), and the individual-level residual, or variation in individual scores within health centers (ε_{ij}). The second model estimated PQoC (Y_{ij}) for individual household i at health center j . We treat PQoC as a function of a matrix of individual-level variables (X_{ij}) which include age, gender, education, current marital status, wealth status, household size, current health insurance status, the presence of chronic illness in the household, perceived health status, and recency of health center visit, and expressed as:

$$Y_{ij} = \gamma_{00} + \gamma_{10}X_{1ij} + \gamma_{20}X_{2ij} + u_{1j}X_{1ij} + u_{2j}X_{2ij} + \dots + \gamma_{n0}X_{nij} + u_{nj}X_{nij} + u_{0j} + \varepsilon_{ij} \quad (2)$$

where $u_{1j}, u_{2j}, \dots, u_{nj}$ indicate the random error terms connected to each X_{ij} .

The third model estimated the PQoC as a function of cluster-level variables (Z_j) that include average work experience, affective commitment and job satisfaction of HCPs, and patient volume. The model accounts for the variation amongst health centers and explains it in terms of these characteristics. It is given by:

$$Y_{ij} = \gamma_{00} + \gamma_{01}Z_{1j} + \gamma_{02}Z_{2j} + \dots + \gamma_{0n}Z_{nj} + \gamma_{11}PV_j * JS_j + u_{0j} + \varepsilon_{ij} \quad (3)$$

where $PV_j * JS_j$ indicates an interaction term between patient volume and job satisfaction in which job satisfaction was assumed to moderate the relationship between patient volume and PQoC. The interaction effect was tested by plotting the marginal effects of interaction terms. The two variables were centered toward the grand mean to facilitate the interpretation of the coefficients.

By combining models II and III, the fourth model estimated the PQoC as a function of both individual and cluster-level variables, and can be written as:

$$Y_{ij} = \gamma_{00} + \gamma_{10}X_{1ij} + \gamma_{20}X_{2ij} + u_{1j}X_{1ij} + u_{2j}X_{2ij} + \dots + \gamma_{n0}X_{nij} + u_{nj}X_{nij} + \gamma_{01}Z_{1j} + \gamma_{02}Z_{2j} + \dots + \gamma_{0n}Z_{nj} + \gamma_{11}PV_j * JS_j + u_{0j} + \varepsilon_{ij} \quad (4)$$

where γ_{10} and γ_{01} are the vector of coefficients of n explanatory variables whose values are at X_{1ij} , X_{2ij} , . . . , X_{nij} for the i^{th} individual within the j^{th} cluster, and Z_{1j} , Z_{2j} , . . . , Z_{nj} for the j^{th} cluster, respectively, while γ_{11} is a coefficient of interaction terms. The intercept γ_{00} and slopes γ_{01} , γ_{10} and γ_{11} are fixed effects, while u_{0j} , u_j , and ε_{ij} are random effects.

This multilevel regression decomposes the total variances into two independent components: σ_e^2 , which is the variance of individual-level errors ε_{ij} , and σ_{u0}^2 , which is the variance of cluster-level errors u_{0j} . From this model we can define the intraclass correlation (ICC) by the equation [158]:

$$ICC = \sigma_{u0}^2 / (\sigma_{u0}^2 + \sigma_e^2)$$

The ICC and proportional change in variance (PCV) were used to report the measures of variation (random effects). The need for multilevel analysis, which considers cluster-level factors, was tested using the ICC. The ICC shows the variation in PQoC accounted for cluster-level characteristics. Statistically significant variability between health centers justifies the need to consider cluster-level factors [159]. The PCV expresses the change in the cluster-level variance between the empty model and models with more terms and is calculated by $PCV = (V_A - V_B)/V_A$, where V_A is the variance of the null model, and V_B is the variance of the model with more terms. It measures the total variation explained by individual and cluster-level factors.

The measures of association (fixed-effects) estimate the association between the PQoC score and various explanatory variables. The existence of a statistically significant association was determined at p-values of <0.05 . The degree of the association was assessed using regression coefficients, and their statistical significance was determined at a 95% confidence level. Models were compared using the Deviance Information Criteria (DIC) and Akaike Information Criteria (AIC). The best fit model was determined to have the lowest DIC and AIC values. The preliminary analysis confirmed no violation of the assumptions of normality, linearity, homoscedasticity, and multicollinearity. The presence of multicollinearity was determined using the Variance Inflation Factor with a cutoff point of 5.

5.4. CBHI enrollment trends and its financial viability (Objectives III and IV)

A similar methodological approach has been used by the third and fourth studies. Therefore, the methods section for the two papers is merged to avoid redundancy.

5.4.1. Study setting

This study was conducted in Tehulederie and Kallu, two rural districts in northeastern Ethiopia. Tehulederie was one of the CBHI pilot districts in Ethiopia, which began implementing the CBHI initiative in July 2011. Two years later, the scheme was launched in Kallu, in July 2013. The scheme at a district level is integrated under the health sector and governed by the health insurance board. The board signs a contract agreement with public health facilities annually, and reimbursements are made every three months based on a fee-for-service payment method. After filing a claim, health facilities must receive the payment within two weeks. Before reimbursing them, the scheme conducts a medical audit. The scheme also reimburses insurance members for OOP expenses for medicines and other services made in private institutions, as long as they follow the correct procedure. *Kebele* leaders and HEWs are the main actors for membership enrollment, renewal, and premium collection at a *Kebele* level. HEWs are community health workers, and one of their responsibilities is to mobilize the community for CBHI enrollment.

5.4.2. Study design

The studies employed a mixed methods case study with both quantitative and qualitative data collected simultaneously. Mixed methods research is an approach to an inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and organizes these procedures into specific research designs [160]. The studies applied a qualitatively driven, concurrent nested design in which the quantitative component was embedded within the primary qualitative study to answer a complementary question [161]. The quantitative part aimed to evaluate the performance of the CBHI scheme in terms of membership development and financial status using key measurement indicators while the qualitative part sought to explore the underlying challenges that impede membership development efforts and the financial viability of the scheme. Thus, the driving motive for combining the two approaches is the belief that both kinds of research have value, and that they generate different but complementary data which offer a holistic view of the scheme's membership development and financial viability.

Results from both the quantitative and qualitative components are presented separately, and the two components are integrated at the data interpretation stage. The findings from the qualitative and quantitative components are discussed, and connections are made between the various challenges explored through the qualitative interviews and the level of performance observed in terms of membership development and financial standing.

5.4.3. Participant selection

The study approach considered each of the CBHI schemes in the two districts as a separate case study of their performance. The two schemes were purposively selected using outlier and typical case sampling strategies. The CBHI in Tehulederie was selected as an outlier case because it was the only scheme functioning as a pilot project in the zone. Since it was launched simultaneously with the schemes in the remaining districts, and serves a diverse population in a large area that shares a variety of geographical features with other districts, the scheme in Kallu district was selected as a typical case. Outlier sampling or deviant case sampling involves selecting information-rich cases, because they are unusual or special in some way, while typical case sampling involves selecting and studying cases that are average to understand, illustrate, and highlight what is typical and normal [162].

The qualitative interview participants in both study sites were purposely selected using the maximum variation technique to gain insight from a diverse range of viewpoints and to chronicle important shared experiences that cut across the various stakeholders participating in the CBHI scheme implementation. Maximum variation sampling involves the selection of a wide range of cases to document the diversity and identify important common patterns that are common across the diversity of dimensions of interest [162].

The key informants were selected among stakeholders based on their active participation in the scheme's implementation and their ability to provide a rich pool of information. A total of 19 key informants were selected by considering the different sectors, which included two scheme personnel, one district health officer, four health center directors, five HCPs, three *Kebele* leaders, and four HEWs. Two of the key informants were coworkers of the principal investigator as HCPs in one of the study districts. Nine community members were selected by HEWs based on their insurance status (current and previous members), and their ability to provide useful information. HEWs are familiar with the population in rural *Kebeles* since their main responsibility is to deliver home-based health services and mobilize the community for health insurance. Five current and four previous insurance

members have participated in this regard. Overall, a total of 28 participants took part in the qualitative interviews. The final sample size at each study district was determined based on data saturation, with no new information emerging from participants [163]. Individuals with similar characteristics to the formal interviewees at district health offices, health facilities, and in the community were also invited for informal interviews. These individuals were interviewed during visits to the various setups based on the relevance of the information they provided in informal interactions.

5.4.4. Data collection

The data were collected between February 8 and May 2, 2021. Quantitative data was gathered by reviewing the databases of the two CBHI schemes retrospectively using checklists developed based on key performance indicators. The data were extracted and collected by scheme administrators and/or finance officers. Data on the eligible target population, the number of new enrollees, and expected as well as actual renewals were collected from the membership enrollment reports for each study period under consideration. Although we intended to examine all years of the scheme's implementation, we were only able to get complete data from 2017 to 2021. Data on financial indicators were obtained from the financial reports of the two CBHI schemes retrospectively. Documents on audited reports, financial statements, and claims payment books of the schemes were reviewed. Data were collected on total contributions, government subsidies, internally generated funds, operational expenditures, and medical bills. Despite we attempted to assess all years of the scheme's execution, we were only able to obtain complete financial data from 2014 to 2020.

Qualitative data were collected using key informant interviews (KII), in-depth interviews (IDI), and informal field interviews (IFI) [162]. The IDI was conducted with current and previous members of CBHI to explore their views and experiences concerning health care quality, claim benefits, scheme services, community interest for enrollment, health care utilization, and OOP payments. The IDIs were conducted at Health Posts (HEW's office).

The KIIs aimed to explore the perspectives of various stakeholders regarding community understanding and acceptability of CBHI, health care quality, claims management, community enrollment practices, risk management, and client and health care provider behaviors that undermine the scheme. Key informants were interviewed at their offices based on a pre-specified schedule. Informal interviews were also made during visits to district health offices, health facilities, and the community to capture important information that could be triangulated with the findings of formal

interviews. Informal interviews are those that are conducted either with a single participant in a natural conversation or with some small group of people, asking normal, conversational questions during periods of informal interaction [162].

All the formal interviews were conducted face-to-face by the principal investigator in convenient locations using an interview guide that was designed to elicit the participants' views via open-ended questions which were further probed to trigger more discussions. Interviews were conducted in Amharic, the local language, and lasted between 10 and 40 minutes. All conversations were audio recorded using a digital voice recorder with the permission of the participants. Field notes were taken during informal interviews. Every person we approached agreed to take part in the study.

5.4.5. Trustworthiness

We used different approaches to enhance the trustworthiness of the data, including data triangulation, thick description, and reflexivity. The different data collection methods and data sources (method and source triangulation) could increase the credibility of the findings [164]. To foster reflexivity, the principal investigator kept a reflexive journal to record expectations, feelings, observations, interview experiences, choices available, and decisions made throughout the research process [160]. A rich, thick description of the research setting, process, and findings was made to enhance its understanding and transferability. We provide a detailed account of the findings, which were backed up by adequate evidence in the form of quotes from participant interviews [163].

5.4.6. Data analysis

Quantitative data obtained through document review were analyzed using selected performance indicators. The trends in CBHI membership enrollment were analyzed using coverage ratio, renewal ratio, and membership growth ratio. The coverage ratio is the proportion of the target population who are insured, whereas the renewal ratio is the proportion of insured households who renewed their subscription during the current period among those eligible to renew. The growth ratio is a combination of coverage and renewal ratios that measures the proportion of the number of insured people who have increased or decreased over time [68, 69].

Quantitative data on financial status were analyzed using the claims ratio and net income ratio. Financial viability refers to the ability of the CBHI scheme to rely on its income to cover expenses over the long term [69]. Both a positive net income ratio and a higher claims ratio indicate that the scheme is financially viable. The trends in claims and net income ratios were analyzed over the last

seven years, from 2014 to 2020. The claims ratio was calculated as the annual incurred claims divided by the earned premium, whereas the net income ratio is the annual net income divided by the earned premium in the same period [68], which in our case is the Ethiopian fiscal year that extends from July to June. The trends of each enrollment and financial indicator were analyzed over the study periods using Microsoft Excel.

Audio records from the qualitative interviews were transcribed verbatim and then translated into English. Field notes were made part of the transcription. Thematic networks analysis was done based on the finalized translated data [165]. The Atlas.ti 9 software package was used to facilitate the coding process. To begin, all the interview transcripts were read and reread to have a thorough understanding of the data set. Both deductive and inductive approaches were used in the coding process. The deductive approach was used as the starting point by defining preliminary themes and sub-themes based on the research questions and a review of existing literature. The themes that emerged during the coding process were added inductively, rather than trying to fit them into a preexisting coding framework. The initial coding schemes were generated independently by the principal investigator who then divided the codes into subthemes and themes. The preliminary results were reviewed by the supervisors and agreements were reached through ongoing discussions.

5.5. Ethical considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of the College of Medicine and Health Science, Bahir Dar University with protocol number 001/2021. A support letter was communicated to the district health offices to gain entry permission into the health facilities and the community where the research was conducted. All study participants were informed about the purpose of the study, the benefit the study will bring to the health system and the community, the time taken to complete the interview, and the participant selection process. In particular, participants who were involved in the quantitative data collection interview were informed that they were not selected based on any prior knowledge, but rather that they were selected by chance. They were also informed that participation is voluntary and that it is their right to withdraw at any time if they are not comfortable with the interview. The interview proceeded only after verbal consent was secured from each of the study participants. For key informants, in-depth interview consent was sought regarding the use of a voice recorder during the interviews. Confidentiality was assured through collecting anonymous information and by informing the participants that personal identifiers will not be revealed to a third party.

6. RESULTS

6.1. Continued adherence to CBHI membership (Objective I)

6.1.1. Baseline characteristics of the study participants

A total of 1232 households ever-enrolled in the CBHI scheme participated in this study with a response rate of 98%. The average age of the study participants was 49.45 years (SD = 12.25), with slightly more than half (50.65%) being between the ages of 45 and 64, and 13.72% being 65 and older. Of the study participants, 1064 (86.36%) were males, and 1132 (91.88%) were currently married. More than three-quarters of the study participants (78.90%) did not attend formal education, and a larger proportion of them (60.88%) had a household size of five and above.

As for the health status, nearly one-fourth of the households (23.70%) had one or more individuals with a known chronic illness, while 490 (39.77%) of the households had received inpatient service under CBHI since they joined the scheme. Moreover, a smaller proportion of the households (17.69%) rated their household health status as fair, while 566 (45.94%) and 448 (36.36%) of them rated it as good and very good, respectively (Table 1).

6.1.2. Time to drop out of the CBHI scheme among the study participants

Among the 1232 study participants, 29.14% (95% CI: 26.61%, 31.77%) had dropped out of CBHI throughout the period under study following their initial enrollment in the scheme with an incidence rate of 5.27 per 100 person-year (95% CI: 4.75, 5.84). A quarter of respondents (25.30%) from Kallu and more than one-third (35.31%) from Tehulederie had dropped out of the scheme. The total follow-up period was 6816 person-years of observation, with an average follow-up time of 5.53 years (95% CI: 5.38, 5.68).

Kaplan–Meier estimates were used to plot the survival function for the time to drop out of CBHI. As shown in Figure 3, the probability of remaining in the scheme beyond 10 years was 59.6%. The median survival time was not reached, because more than 50% of the study participants remained in the scheme beyond the follow-up time.

Table 1: Characteristics of households ever enrolled in a CBHI scheme in measuring the time to drop out in two districts of northeast Ethiopia, 2021

Variables	Categories	Renewals /Censored, N(%)	Dropouts /Events, N(%)	Total N(%)
Age in years	25 – 44	319 (36.54)	120 (33.43)	439 (35.63)
	45 – 64	430 (49.26)	194 (54.04)	624 (50.65)
	65+	124 (14.20)	45 (12.53)	169 (13.72)
Gender	Male	772 (88.43)	292 (81.34)	1,064 (86.36)
	Female	101 (11.57)	67 (18.66)	168 (13.64)
Current marital status	Unmarried	48 (5.50)	52 (14.48)	100 (8.12)
	Married	825 (94.50)	307 (85.52)	1,132 (91.88)
Educational status	No formal education	689 (78.92)	283 (78.83)	972 (78.90)
	Attend formal education	184 (21.08)	76 (21.17)	260 (21.10)
Household size	< Five	323 (37.00)	159 (44.29)	482 (39.12)
	≥ Five	550 (63.00)	200 (55.71)	750 (60.88)
Wealth tertile	Lowest	271 (31.04)	139 (38.72)	410 (33.28)
	Medium	294 (33.68)	117 (32.59)	411 (33.36)
	Highest	308 (35.28)	103 (28.69)	411 (33.36)
Participation in a Safety net program	No	743 (85.11)	318 (88.58)	1,061 (86.12)
	Yes	130 (14.89)	41 (11.42)	171 (13.88)
Perceived health status	Fair	159 (18.21)	59 (16.43)	218 (17.69)
	Good	408 (46.74)	158 (44.01)	566 (45.94)
	Very good	306 (35.05)	142 (39.55)	448 (36.36)
Chronic illness	No	642 (73.54)	298 (83.00)	940 (76.30)
	Yes	231 (26.46)	61 (17.00)	292 (23.70)
Hospitalization	No	488 (55.90)	254 (70.75)	742 (60.23)
	Yes	385 (44.10)	105 (29.25)	490 (39.77)
Perceived quality of health care	Low	283 (32.42)	133 (37.05)	416 (33.77)
	Medium	292 (33.45)	115 (32.03)	407 (33.04)
	High	298 (34.14)	111 (30.92)	409 (33.20)
Value towards solidarity	Low	283 (32.42)	137 (38.16)	420 (34.09)
	Medium	382 (43.76)	140 (39.00)	522 (42.37)
	High	208 (23.82)	82 (22.84)	290 (23.54)
Perceived financial risk protection	Low	256 (29.32)	157 (43.73)	413 (33.52)
	Medium	201 (23.02)	83 (23.12)	284 (23.05)
	High	416 (47.65)	119 (33.15)	535 (43.43)
Trust in scheme	Low	245 (28.06)	159 (44.29)	404 (32.79)
	Medium	287 (32.88)	124 (34.54)	411 (33.36)
	High	341 (39.06)	76 (21.17)	417 (33.85)
District	Tehulederie	306 (64.69)	167 (35.31)	473 (38.39)
	Kallu	567 (74.70)	192 (25.30)	759 (61.61)
	Total	873 (70.86)	359 (29.14)	1,232 (100)

To describe how the time to drop out of CBHI was distributed by different variables; Kaplan–Meier curves were plotted for selected variables that were significant at p-value <0.05 based on the log-rank test (Figure 5). For the first 10 months after initial enrollment, survival curves for respondents who were male, and married were consistently above those who were female and unmarried. There exists also a clear difference in the survival curve of households having a chronic illness and those who had received inpatient service under CBHI compared to their reference groups, both of which prolong the time to drop out. Similarly, the survival curves for respondents who had a high-level perception of the quality of health care and the financial risk protection ability of the scheme, and who had high-level trust in the scheme management were above their counterparts.

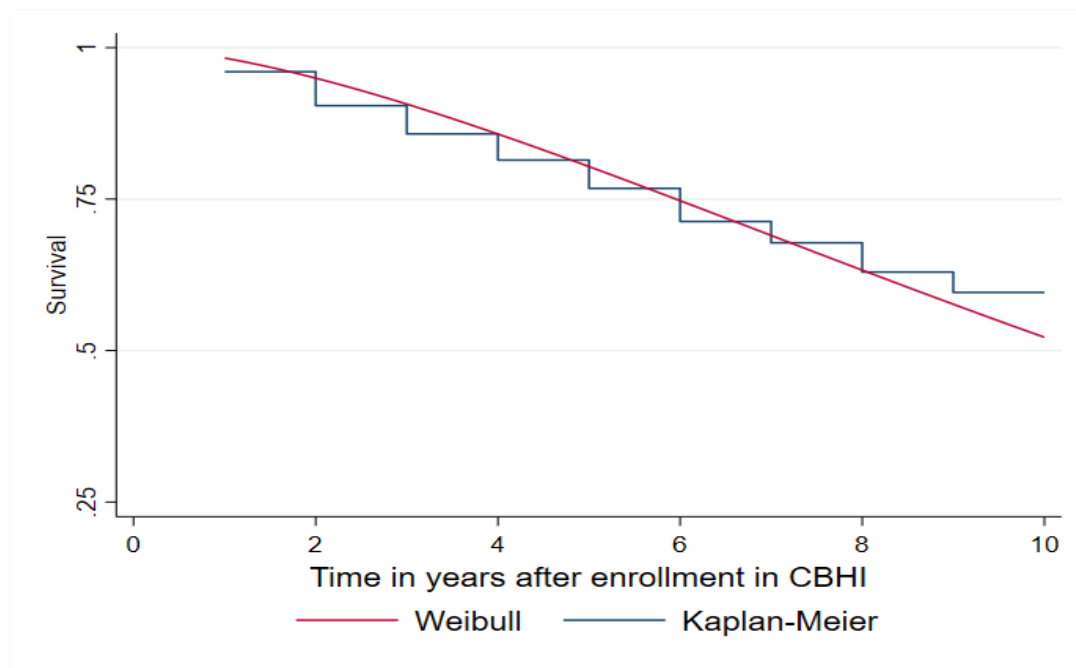


Figure 3: Kaplan–Meier curve (stairstep line) and Weibull survival plot (solid line) for the time to drop out of CBHI membership in two districts of northeast Ethiopia, 2021

6.1.3. Model selection

Multivariable AFT models of exponential, Weibull, lognormal, and log-logistic baseline hazard functions were fitted by considering both the gamma and inverse-Gaussian frailty distributions. The Weibull AFT inverse-Gaussian shared frailty model, which had minimum AIC and BIC values, was the preferred model to analyze the data. The AIC and BIC values of the different parametric AFT models with gamma and inverse-Gaussian shared frailty distributions are displayed in Table 2.

Table 2: Comparison of the AFT shared frailty models based on the AIC and BIC values to identify factors associated with the time to drop out in two districts of northeast Ethiopia, 2021

Baseline distribution	Frailty distribution	AIC	BIC	Variance (θ)	p-value of LR test of $\theta = 0$
Exponential	Gamma	1858.14	1945.11	0.080	< 0.001
	Inverse-Gaussian	1857.50	1944.48	0.084	< 0.001
Weibull	Gamma	1779.42	1871.52	0.117	< 0.001
	Inverse-Gaussian	1779.13	1871.23	0.126	< 0.001
Lognormal	Gamma	1787.85	1879.94	0.101	< 0.001
	Inverse-Gaussian	1787.45	1879.55	0.106	< 0.001
Log-logistic	Gamma	1785.84	1877.93	0.107	< 0.001
	Inverse-Gaussian	1785.37	1877.46	0.112	< 0.001

The four parametric AFT baseline distributions with Gamma and inverse-Gaussian frailty distributions were fitted by using *Kebele* as a frailty component. The frailty effect was statistically significant for all the parametric survival AFT models, both in the null and full models. The frailty in the final model is assumed to follow an inverse-Gaussian distribution with a mean of 1 and a variance equal to theta (θ). The variance of the random effect ($\theta = 0$) would mean that the frailty component does not contribute to the model. The estimated variability (heterogeneity) in the population of clusters (*Kebeles*) using the Weibull inverse-Gaussian shared frailty model was 0.126. The likelihood ratio test that assumes a variance of frailty $\theta = 0$ resulted in a highly statistically significant p-value of <0.001, indicating that the frailty component has a significant contribution to the model and that there is an intra-cluster correlation. The estimated value of the variance of the frailty in the null model was 0.161. The value of the shape parameter in the Weibull inverse-Gaussian shared frailty model was greater than unity ($\rho = 1.573$, p-value <0.001), which indicates that the hazard increases to a maximum point and then decreases over time, resulting in a unimodal hazard function which is due to the frailty effect [146].

The goodness of fit of the final model was checked using the Cox–Snell residuals plot. The Cox–Snell residuals plot of the Weibull AFT inverse-Gaussian frailty model was closer to the 45-degree straight line, with a slight deviation in the right tail, suggesting that the model well-fitted the time to drop out data (Figure 4). Some variability is expected at the 45-degree straight line, especially in the

right tail, although we have a well-fitting model. This deviation was due to the reduced effective sample size caused by earlier dropouts [166].

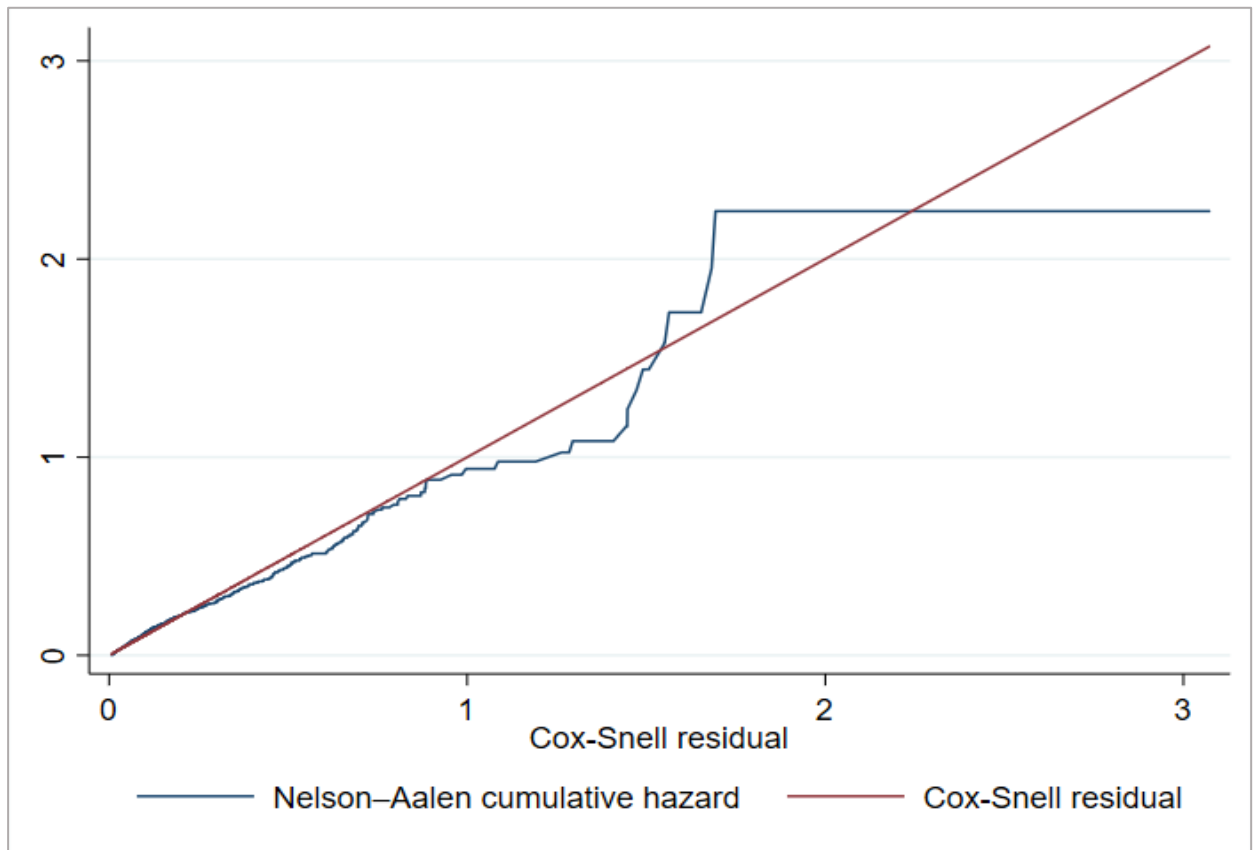


Figure 4: Cumulative hazard plot of Cox-Snell residual for the Weibull AFT model

6.1.4. Analytical results of the Weibull AFT inverse-Gaussian shared frailty model

Based on the values of the AIC and BIC, and the variance of the frailty effect, the Weibull inverse-Gaussian shared frailty model was selected as the preferred parametric survival model to analyze the data. Variables with a p-value of <0.20 in the univariate analysis of the Weibull inverse-Gaussian shared frailty model were included in the multivariable analysis. Since the frailty survival model takes cluster (sub-district) level characteristics into account, we analyze it by combining data from both districts.

In the univariate analysis, age, gender, marital status, household size, perceived health status, the presence of chronic illness, history of hospitalization under the scheme, perceived quality of health care, perceived financial risk protection, and trust in the scheme management were significantly associated with time to drop out at a p-value of 0.05, while the educational status of the household-

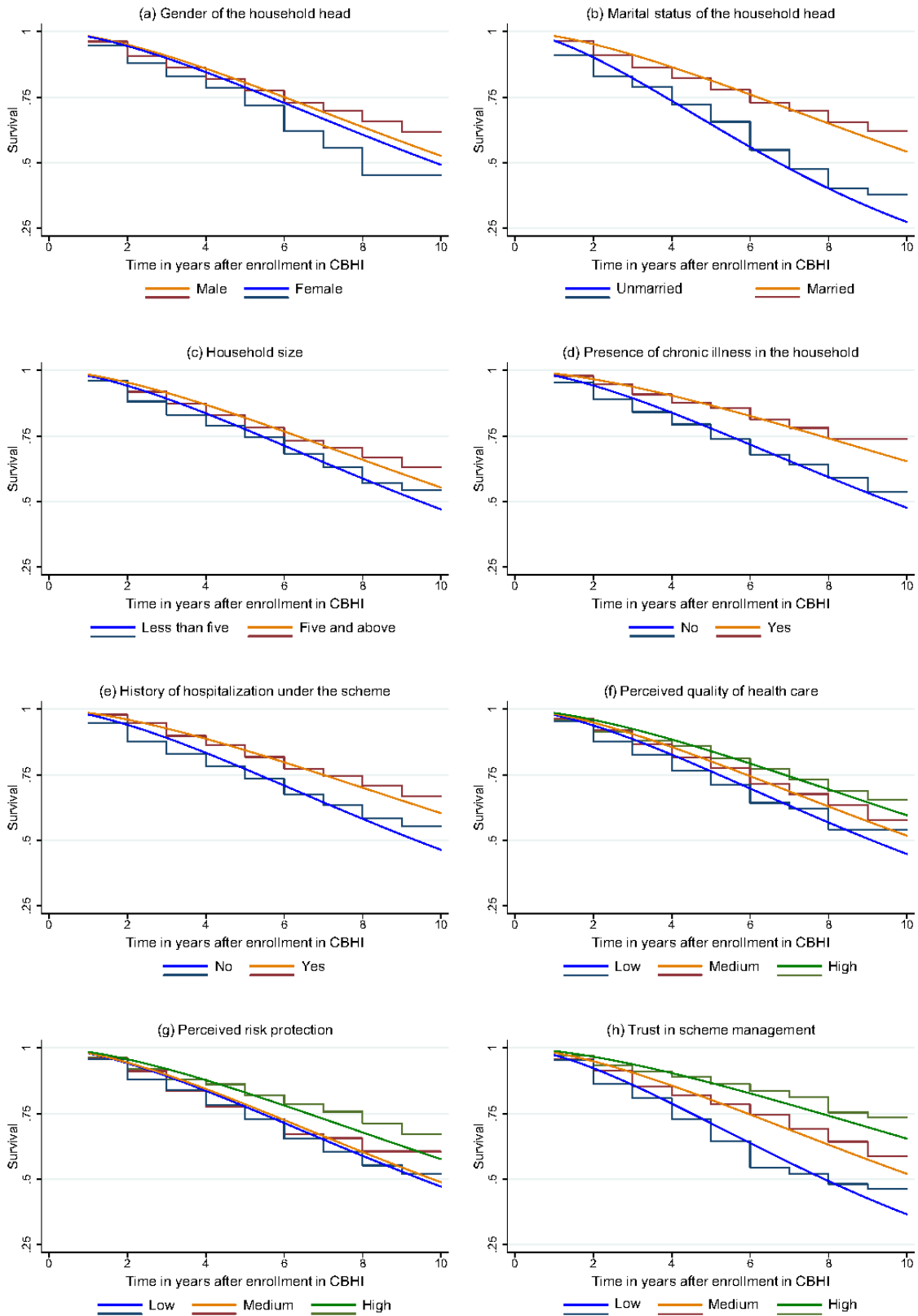


Figure 5: KM curves (stairstep lines) and Weibull survival plots (solid lines) for selected variables associated with the time to drop out of CBHI in two districts of northeast Ethiopia, 2021

head, wealth tertile, safety net program coverage and value towards solidarity were not statistically significant at a p-value of 0.20. After fitting the multivariable model, the Weibull distributions of selected variables were plotted over the respective KM curves to show how well the estimated Weibull survival plots fitted the data (Figure 5).

After adjusting for other independent variables, and keeping households in the same cluster, all variables included in the multivariable analysis were significantly associated with the time to drop out of the CBHI scheme at a 95% confidence level, except age, gender, and perceived health status (Table 3). Accordingly, the time to drop out for married households was increased by a factor of 1.610 compared to their counterparts of unmarried households ($\delta = 1.610$; 95% CI: 1.216, 2.130). Scheme members having larger household sizes adhere to the scheme longer compared to those having smaller household sizes with an acceleration factor of 1.168 ($\delta = 1.168$; 95% CI: 1.013, 1.346).

The time to drop out for scheme members who had a known chronic illness increased significantly by an acceleration factor of 1.424 ($\delta = 1.424$; 95% CI: 1.165, 1.740). This shows that years of membership adherence for households who had a chronic illness in their household was extended by 42.4% compared to those without a chronic illness. Similarly, the time to drop out for households who had received inpatient service under the scheme was estimated to be 1.306 times that of households who did not receive inpatient service ($\delta = 1.306$; 95% CI: 1.118, 1.527).

The time to drop out for scheme members who rated the quality of health care as high was estimated to be 1.322 times that of households who rated it as low ($\delta = 1.322$; 95% CI: 1.100, 1.587). The time to drop out for scheme members who had a high-level perception of the financial risk protection ability of the scheme was estimated to be 1.218 times that of households who had a low-level perception ($\delta = 1.218$; 95% CI: 1.027, 1.444). Likewise, the time to drop out for scheme members who had medium and high-level trust in the scheme management is extended by 31.5% and 73.1%, respectively, compared to those who had low-level trust ($\delta = 1.315$; 95% CI: 1.107, 1.563) and ($\delta = 1.731$; 95% CI: 1.428, 2.098), indicating higher membership adherence.

Table 3: Analysis results of the Weibull inverse-Gaussian shared frailty model on factors associated with the time to drop out of CBHI in two districts of northeast Ethiopia, 2021

Variables	Categories	Coef.	S. E	δ	<i>p</i> -value	95% CI for δ
Intercept		1.356	0.205	3.879	0.000	(2.598, 5.793)
Age in years	25-44	ref.				
	45-64	-0.014	0.076	0.986	0.850	(0.849, 1.145)
	65+	0.172	0.119	1.188	0.148	(0.941, 1.501)
Gender	Male	ref.				
	Female	-0.063	0.124	0.939	0.611	(0.735, 1.198)
Current marital status	Unmarried	ref.				
	Married	0.476	0.143	1.610	0.001	(1.216, 2.130)
Household size	Smaller (<5)	ref.				
	Larger (≥ 5)	0.155	0.072	1.168	0.032	(1.013, 1.346)
Perceived health status	Fair	ref.				
	Good	0.037	0.108	1.037	0.736	(0.839, 1.282)
	Very good	-0.081	0.113	0.922	0.471	(0.739, 1.150)
Chronic illness	No	ref.				
	Yes	0.353	0.102	1.424	0.001	(1.165, 1.740)
Hospitalization	No	ref.				
	Yes	0.267	0.080	1.306	0.001	(1.118, 1.527)
Perceived quality of health care	Low	ref.				
	Medium	0.127	0.085	1.135	0.135	(0.961, 1.340)
	Haigh	0.279	0.093	1.322	0.003	(1.100, 1.587)
Perceived financial risk protection	Low	ref.				
	Medium	0.030	0.094	1.031	0.748	(0.857, 1.240)
	Haigh	0.197	0.087	1.218	0.023	(1.027, 1.444)
Trust in scheme	Low	ref.				
	Medium	0.274	0.088	1.315	0.002	(1.107, 1.563)
	Haigh	0.549	0.098	1.731	0.000	(1.428, 2.098)
$\ln(\rho) = 0.453$ ($p < 0.001$)				$\gamma = 0.636$ (S.E = 0.028)		
$\rho = 1.573$ (S.E = 0.069)				AIC = 1779.13		
$\theta = 0.126$ (S.E = 0.066)				BIC = 1871.23		

Notes: CI – Confidence Interval; coef. – regression coefficient; S.E – Standard error; δ – Acceleration factor; ρ – Shape parameter, γ – Scale parameter, $\gamma = 1/\rho$; θ – Variance of the random effect; ref. – reference category; AIC – Akaike’s Information Criterion; BIC – Bayesian Information Criterion.

6.2. Perceived quality of care (Objective II)

6.2.1. Background characteristics of the study participants

The household survey included 1081 respondents who had visited a health center at least once in the previous 12 months prior to the study. The average age of the study participants was 49.25 years (SD = 12.07), with slightly more than half (51.34%) were between the age ranges of 45 and 64, and 12.67% being 65 and older. Of the total household heads, 938 (86.77%) were men, and 1003 (92.78%) were currently married. One-fifth of the study participants (20.91%) attended formal education, and 62.72% had a household size of five or above.

Table 4: Independent t-test and one-way ANOVA comparing mean scores of the PQoC (20-100 scale) across respondent characteristics in two districts of northeast Ethiopia, 2021

Variable	Categories	N=1081	%	PQoC score		t/F-test
				M	SD	
Age in years	25 – 44	389	35.99	69.97	7.78	1.08
	45 – 64	555	51.34	70.26	8.52	
	65+	137	12.67	71.20	9.49	
Gender	Men	938	86.77	70.15	8.21	-1.31
	Women	143	13.23	71.13	9.51	
Current marital status	unmarried	78	7.22	71.61	10.95	1.46
	Married	1003	92.78	70.17	8.16	
Attend formal education	No	855	79.09	70.29	8.48	0.07
	Yes	226	20.91	70.24	8.05	
Household size	< Five	403	37.28	70.85	8.63	1.73
	≥ Five	678	62.72	69.94	8.25	
Wealth tertile	Lowest	361	33.40	71.77	9.15	8.83 [#]
	Medium	360	33.30	69.36 ^b	8.16	
	Highest	360	33.30	69.70 ^b	7.62	
Current insurance status	Ex-member	139	12.86	67.66	9.65	-3.96 [#]
	Active-member	942	87.14	70.66	8.13	
Perceived health status	Fair	207	19.15	72.28	8.84	8.04 [#]
	Good	511	47.27	70.08 ^b	7.83	
	Very good	363	33.58	69.41 ^b	8.73	
Chronic illness	No	803	74.28	69.54	8.29	-4.96 [#]
	Yes	278	25.72	72.40	8.33	
Recent health center visit	< 3 months	499	46.16	70.75 ^b	8.99	4.78 [§]
	3-6 months	239	22.11	70.94 ^b	7.60	
	6-12 months	343	31.73	69.13	7.92	
Total		1081	100	70.28	70.28	

Statistical significance for t-test/F-test is indicated by [§] $p < 0.01$, and [#] $p < 0.001$. Based on Tukey's post-hoc test, mean values sharing letter 'b' are not significantly different in the group at the 5% level.

Nearly ninety percent of the households (87.14%) were active members of the CBHI scheme at the time of the study. A quarter of households (25.72%) had one or more individuals with a known chronic illness informed by a HCP. One-third of respondents (33.58%) rated their household health status as very good, while 207 (19.15%) and 511 (47.27%) rated it as fair and good, respectively. Nearly half of the households (46.16%) had visited a health center within three months prior to the study, while 31.73% and 22.11% had their most recent visit to a health center before 6-12 and 3-6 months, respectively (Table 4).

A total of 194 HCPs from 12 different health centers completed a self-administered questionnaire designed to gather information about facility-level characteristics. The median work experience of HCPs involved in this study ranges from three to ten years. The mean scores of affective commitment and job satisfaction were 29.00 and 30.95 (SD = 2.08 and 3.17) which is on a scale of 7 to 35 and 10 to 50, respectively. The average patient volume was 32.17 per day per care provider, with a range of 19 to 43 (SD = 7.83).

6.2.2. Factor analysis

Sampling was adequate as measured by the KMO (0.83), and Bartlett's test of sphericity was significant ($p < 0.001$). Therefore, it was determined that the correlation matrix was appropriate for factor analysis. The initial scale used in data collection comprised 20 items, however, the factor analysis reduced the number to 17. Two items were removed from further analysis due to loadings below 0.4, while one item was removed due to low communality. Five dimensions of PQoC were extracted from the factor analysis: technical care, patient-provider communication, information provision, access to care, and trust in care providers. The five dimensions explained 59.25% of the total variance.

Item-item Spearman correlations were calculated; none of the correlation coefficients were above the 0.70 threshold. The factor loadings ranged from 0.463 to 0.911, with all items having factor loadings greater than the 0.40 threshold (Table 5). The item-total score correlations ranged from 0.268 to 0.622, four items had correlations less than 0.4, and all were statistically significant at a p -value of 0.001. The dimension intercorrelations ranged from 0.031 to 0.434, all of which were less than the 0.80 criterion, indicating that each dimension was distinct enough to be considered an independent measure. Dimension-total score correlation range between 0.417 to 0.772, all significant at a p -value of 0.001, and are higher than dimension intercorrelations (Table 6).

Table 5: Factor loadings and item-total score correlations of the PQoC scale

Factors and items	Loadings	ITC*
Technical care		
The necessary laboratory tests were performed	0.911	0.561
Health care providers perform the necessary physical examinations	0.818	0.622
Health care providers make good diagnoses	0.740	0.597
Patient-provider communication		
Health care providers actively ask questions to understand your situation	0.846	0.373
Health care providers listened to you carefully what you had to say	0.845	0.408
Health care providers treated you with courtesy and respect	0.543	0.568
Information provision		
Health care providers clearly explained the use and side effects of medicines	0.787	0.461
Health care providers clearly explained the results of tests and examination	0.760	0.560
Health care providers explain things in a way you could understand	0.672	0.499
Health care providers spent sufficient time examining patients	0.510	0.516
Access to care		
Patients do not wait long in the health center to receive treatment	0.801	0.268
All prescribed medicines are available on the spot	0.624	0.365
Health center assistants are friendly and helpful to patients	0.559	0.456
The health center serves all patients fairly	0.463	0.463
Trust in care providers		
Treatment is effective for recovery and cure	0.754	0.424
Health care providers prescribe appropriate medicines for patients	0.672	0.347
You have confidence in the competence of health care providers	0.662	0.471

ITC* Item-total score correlation.

The scale was tested for reliability and had an overall Cronbach's alpha coefficient of 0.804. The Cronbach's alpha coefficients for the five dimensions exceeded 0.60, except for the access to care subscale, which had an alpha coefficient of 0.531 (Table 6).

Table 6: Inter-scale correlations and Cronbach's alpha coefficients of factors

Factors						Cronbach's alpha
	1	2	3	4	5	
Technical care	1.00					0.778
Patient-provider communication	0.434	1.00				0.629
Information provision	0.377	0.336	1.00			0.690
Access to care	0.326	0.365	0.141	1.00		0.531
Trust in care providers	0.199	0.103	0.031	0.123	1.00	0.688
Total score	0.772	0.666	0.660	0.600	0.417	---

6.2.3. Perceptions of the quality of health care

On a scale of 20 to 100, the minimum and maximum PQoC scores were 37.65 and 97.65, respectively. The mean score was 70.28 (95% CI: 69.77, 70.78) with SD of 8.39. The aggregated mean score at the health center level ranges from 64.94 to 74.06. Patient-provider communication had the highest mean score ($M = 77.84$, $SD = 10.12$) of the five quality dimensions, while information provision had the lowest score ($M = 64.67$, $SD = 13.87$). Regarding item-level observations, waiting time and medicine availability received the lowest perception scores (62.96 and 63.50, respectively). The mean score for each measurement item is summarized in Annex 1.

An independent t-test and a one-way ANOVA were performed to compare the mean scores of PQoC and its dimensions between subgroups. As shown in Table 4, there was a significant difference in the PQoC mean score for wealth tertile at $p < 0.05$ ($F = 8.83$, $p = 0.001$). Tukey's post-hoc test indicated that the mean score of PQoC for the lowest wealth tertile ($M = 71.77$, $SD = 9.15$) was significantly different from both the medium ($M = 69.36$, $SD = 8.16$) and highest ($M = 69.70$, $SD = 7.62$) wealth tertile. However, no significant difference was seen between medium and high wealth tertile. The ANOVA test also showed that the PQoC mean score showed significant differences based on the respondent's perceived health status and recency of visit to a health center, with ($F = 8.04$, $p < 0.001$) and ($F = 4.78$, $p < 0.01$), respectively. There was a significant difference in the mean score of PQoC between active insurance members ($M = 3.53$, $SD = 0.41$) and ex-members ($M = 3.38$, $SD = 0.48$); $t = 3.96$, $p < 0.001$. The mean PQoC score of households with chronic illness ($M = 3.62$, $SD = 0.42$) was also significantly higher compared to those who did not have a chronic illness ($M = 3.48$, $SD = 0.42$); $t = 4.95$, $p < 0.001$.

The results of an independent t-test and a one-way ANOVA that compare the differences in mean scores of the five dimensions between subgroups are displayed in Table 7. For instance, there is a significant difference in the mean score of technical care between active insurance members ($M = 68.87$, $SD = 15.10$) and ex-members ($M = 64.75$, $SD = 15.73$); $t = 2.99$, $p = 0.003$. The mean score for technical care is also significantly different among groups of respondents with different perceived health statuses ($F = 11.24$, $p < 0.001$). Based on Tukey's post-hoc test, the mean score of technical care for households who rate their health status as very good ($M = 65.67$, $SD = 16.31$) was significantly different from households who rate it as good ($M = 68.85$, $SD = 14.73$) and fair ($M = 71.76$, $SD = 13.73$). However, no significant difference was seen between households who rate it as good and fair.

Table 7: Independent t-test and one-way ANOVA comparing mean scores of PQoC dimensions (20-100 scale) across respondent characteristics in two districts of northeast Ethiopia, 2021

Variables	N	Technical care		Communication		Information provision		Access to care		Trust in providers	
		M	SD	M	SD	M	SD	M	SD	M	SD
Age in years											
25 – 44	389	68.33	15.61	77.60	9.89	62.75 ^b	13.73	69.99	11.64	73.59 ^b	10.11
45 – 64	555	68.14	15.19	77.71	10.01	64.60 ^b	14.03	69.41	12.04	73.61 ^b	10.96
65+	137	69.15	14.44	79.03	11.19	70.36 [#]	12.09	68.25	10.97	70.46 [§]	13.21
Gender											
Men	938	68.36	15.15	77.67	10.17	64.40	13.80	69.34	11.67	73.18	10.80
Women	143	68.48	16.00	78.93	9.81	66.40	14.27	70.31	12.42	73.38	12.37
Current marital status											
Unmarried	78	70.77	14.74	78.80	12.10	70.77 [#]	13.58	67.18	13.03	72.31	14.01
Married	1003	68.15	15.27	77.76	9.96	64.19	13.79	69.65	11.65	73.27	10.75
Formal education											
No	855	68.37	15.41	77.78	10.29	64.43	13.98	69.63	11.64	73.39	11.13
Yes	226	68.20	14.62	78.05	9.54	65.55	13.46	68.89	12.24	72.51	10.56
Household size											
< Five	403	69.10	15.21	78.51	10.07	65.14	14.31	70.37	11.25	73.18	11.94
≥ Five	678	67.89	15.25	77.43	10.14	64.39	13.61	68.94	12.04	73.22	10.44
Wealth tertile											
Lowest	361	69.64	14.42	79.56 [#]	9.94	70.21 ^{a#}	12.84	68.70	11.49	72.13 ^a	13.07
Medium	360	67.11	15.28	76.80 ^b	10.57	63.08 ^a	14.40	69.00	11.82	73.02 [*]	10.45
Highest	360	68.26	15.93	77.13 ^b	9.65	60.69 ^a	12.54	70.63	11.94	74.46 ^a	9.04
Insurance status											
Ex-member	139	64.75 [§]	15.73	74.29 [§]	12.91	63.13	14.46	67.05 [§]	13.56	70.79 [§]	13.07
Active-member	942	68.87	15.10	78.36	9.54	64.89	13.78	69.83	11.44	73.56	10.64
Perceived health status											
Fair	207	71.76 ^b	13.73	80.35 [#]	9.55	70.02 [#]	12.87	68.62	11.51	72.59 [*]	11.83
Good	511	68.85 ^b	14.73	76.73 ^b	10.06	63.86 ^b	13.95	69.18	11.14	74.16 ^a	9.83
Very good	363	65.67 [#]	16.31	77.96 ^b	10.29	62.74 ^b	13.59	70.37	12.71	72.21 ^a	11.99
Chronic illness											
No	803	67.39 [#]	15.58	77.30 [§]	10.35	63.09 [#]	13.74	69.13	11.90	73.07	10.94
Yes	278	71.08	13.90	79.38	9.29	69.21	13.26	70.47	11.33	73.60	11.25
Recent health center visit											
< 3 months	499	68.08	15.10	78.46	10.25	68.07 [#]	13.95	68.88 ^b	11.49	71.77 [#]	12.20
3-6 months	239	69.71	14.79	77.68	9.97	62.97 ^b	12.90	71.67 [§]	11.28	75.06 ^b	9.31
6-12 months	343	67.76	15.74	77.03	10.02	60.90 ^b	13.26	68.80 ^b	12.34	73.99 ^b	10.01
Total	1081	68.34	15.24	77.84	10.12	64.67	13.87	69.47	11.77	73.20	11.02

Statistical significance for t-test/F-test is indicated by * $p < 0.05$, § $p < 0.01$, and # $p < 0.001$. Based on Tukey's post-hoc test, mean values sharing letter 'a' are significantly different; while mean values sharing letter 'b' are not significantly different in the group at the 5% level.

The mean PQoC score was significantly different among health centers ($F = 11.85, p < 0.001$). The mean scores for the five dimensions were also significantly different among health centers at $p < 0.001$ level: technical care ($F = 8.66$), patient-provider communication ($F = 6.65$), information provision ($F = 47.42$), access to care ($F = 36.87$) and trust in care providers ($F = 6.98$). The mean scores of the PQoC and its dimensions across the 12 health centers are depicted using a radar chart (Figure 6). The chart shows a comparison of mean scores on a scale of 10 to 90. For example, respondents from 11 health centers had a higher perception score on patient-provider communication than other dimensions with less variation, while the information provision dimension was mostly ranked lowest with more variability.

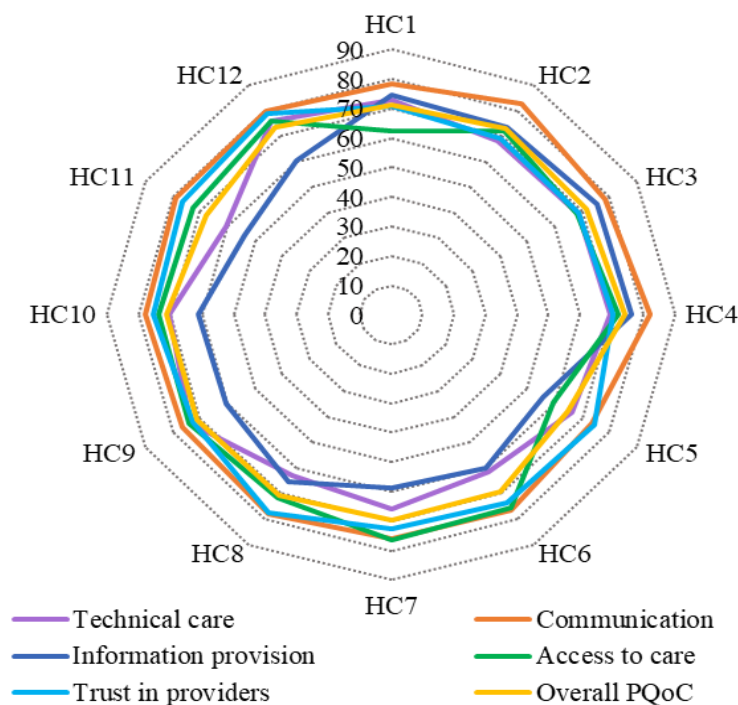


Figure 6: Summary of the mean scores of the PQoC and its dimensions across 12 health centers (HC) in two districts of northeast Ethiopia, 2021

6.2.4. Factors associated with perceived quality of care: Multilevel analysis

The fixed effects (measures of association) and the random effects (measures of variation) for the multilevel linear regression model are depicted in Table 8. In the null model, 8.50% of the total variance in PQoC was attributed to cluster-level variables. The variability between clusters was statistically significant ($\tau = 5.90, p < 0.001$). Furthermore, the null model showed a significant improvement in fit relative to a standard linear model, illustrating the importance of employing a multilevel model.

The cluster-level variation in Model II remained significant ($\tau = 6.33, p < 0.001$), with 9.31% of the total variability attributed to differences across clusters. The PCV was negative in this model, indicating that individual-level characteristics did not play a role in explaining the variation between clusters. In Model III, cluster-level variables accounted for just 1.33% of the variation in PQoC across clusters. The PCV showed that cluster-level variables explained 85.42% of the variation between health centers, indicating the importance of including cluster-level characteristics to build a more robust explanatory model. We interpreted the results of the regression analysis using Model IV, which has the lowest DIC and AIC values.

After adjusting for other individual and cluster-level factors, the mean PQoC score for households with higher wealth tertile increased by 1.79 points compared to those with lower wealth tertile ($b = 1.79$; 95% CI: 0.37, 3.21). Households who were active members of CBHI at the time of the study had a 2.70-point higher PQoC score than ex-members ($b = 2.70$; 95% CI: 1.25, 4.14). The PQoC score of households who rated their health status as very good was 1.80 points lower compared to those who rated it as fair ($b = -1.80$; 95% CI: -3.31, -0.29). Compared to households without a chronic illness, those with one or more family members with a chronic illness had a 1.42-point higher perception score ($b = 1.42$; 95% CI: 0.22, 2.63). Recency of visit to a health center was also significantly associated with PQoC score. The mean score for households who had their most recent visit to a health center before 3-6 months was 1.89 points higher compared to those whose recent visit was within 3 months prior to the study ($b = 1.89$; 95% CI: 0.61, 3.17).

Regarding cluster-level variables, the average work experience of HCPs and patient volume had statistically significant associations with PQoC. A 1.07-point improvement in the average PQoC score of health centers was noted for every year's increase in the median work experience of HCPs ($b = 1.07$; 95% CI: 0.74, 1.40). An interaction term between patient volume and job satisfaction was positively associated with PQoC, implying that improving staff job satisfaction would buffer or lessen the effect of patient volume on PQoC. At an average staff job satisfaction, a 0.42-point drop in the average PQoC score of health centers was observed for a unit increase in patient volume ($b = -0.42$; 95% CI: -0.50, -0.33). A one-unit increase in patient volume would only result in a 26% fall in average PQoC if the average job satisfaction is set one SD above the mean. This prediction was substantiated by the fact that the margins graph for patient volume showed the flattest slope for higher job satisfaction (Figure 7).

Table 8: Multilevel linear regression analysis of factors associated with PQoC among households ever enrolled in a CBHI scheme in two districts of northeast Ethiopia, 2021

Variables	Model I		Model II	Model III	Model IV
	Category		b (95% CI)	b (95% CI)	b (95% CI)
Fixed effects					
Age			-0.02 (-0.06, 0.03)		-0.03 (-0.07, 0.02)
Gender	Men		ref.		
	Women		0.64 (-1.06, 2.34)		0.80 (-0.88, 2.49)
Current marital status	Unmarried		ref.		
	Married		-0.14 (-2.42, 2.15)		0.18 (-2.09, 2.45)
Modern education	No		ref.		
	Yes		-0.07 (-1.34, 1.19)		-0.25 (-1.49, 1.00)
Wealth tertile	Low		ref.		
	Medium		-0.57 (-1.89, 0.74)		-0.16 (-1.40, 1.09)
	High		0.73 (-0.87, 2.34)		1.79 (0.37, 3.21)*
Household size	Small (< 5)		ref.		
	Large (≥ 5)		-0.28 (-1.28, 0.72)		-0.31 (-1.31, 0.68)
Insurance status	Ex-member		ref.		
	Active member		2.65 (1.20, 4.11)#		2.70 (1.25, 4.14)#
Perceived health status	Fair		ref.		
	Good		-0.75 (-2.16, 0.66)		-0.73 (-2.14, 0.67)
	Very good		-1.78 (-3.29, -0.26)*		-1.80 (-3.31, -0.29)*
Chronic illness	No		ref.		
	Yes		1.55 (0.34, 2.76)*		1.42 (0.22, 2.63)*
Recent health center visit	< 3 months		ref.		
	3-6 months		1.64 (0.35, 2.94)*		1.89 (0.61, 3.17)§
	6-12 months		0.77 (-0.45, 1.99)		1.02 (-0.18, 2.21)
Work experience				0.75 (0.33, 1.17)§	1.07 (0.74, 1.40)#
Affective commitment				0.48 (0.04, 1.00)	0.27 (-0.10, 0.65)
Patient volume				-0.33 (-0.45, -0.21)#	-0.42 (-0.50, -0.33)#
Job satisfaction				0.01 (-0.24, 0.27)	0.07 (-0.10, 0.24)
Patient volume x Job satisfaction				0.06 (0.02, 0.11)§	0.05 (0.02, 0.08)§
Random effect					
τ (SE)		5.90 (2.78)#	6.33 (3.10)#	0.86 (0.94)	≈ 0.00
ICC (%)		8.50	9.31	1.33	≈ 0.00
PCV (%)		Reference	-7.29	85.42	≈ 100
Model fitness					
DIC		7578.01	7528.89	7572.79	7516.90
AIC		7584.01	7560.89	7588.79	7558.90

* $p < 0.05$; § $p < 0.01$; # $p < 0.001$; τ - Cluster-level variance, ICC - Intraclass Correlation; PCV - Proportional Change in Variance; DIC - Deviance Information Criterion; AIC - Akaike Information Criterion; SE – standard error; b - regression coefficient; CI – Confidence Interval; ref. – reference category.

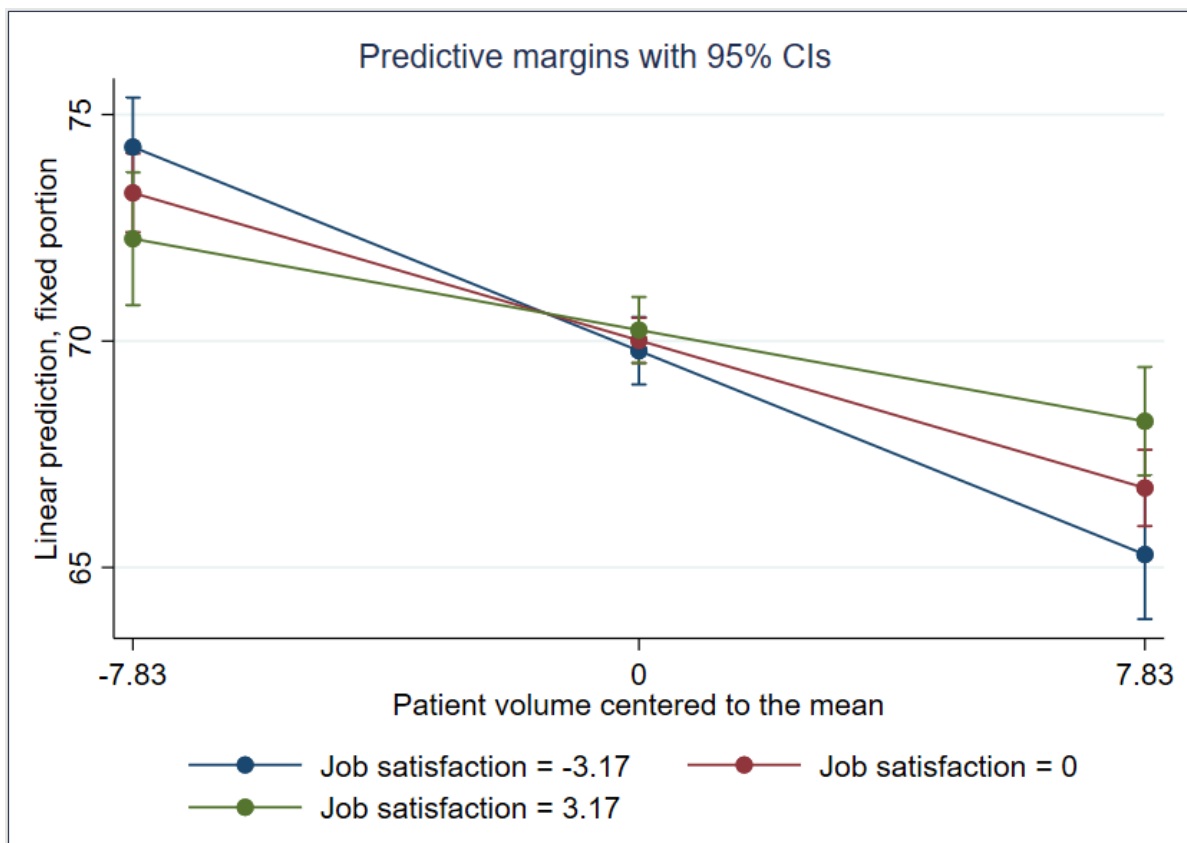


Figure 7: Interaction plot showing the moderating role of staff job satisfaction on the relationship between patient volume and PQoC

6.3. CBHI enrollment trends (Objective III)

6.3.1. Enrollment trends in the scheme

Over the period under study, the number of insured households ranged between 11,535 to 14,188 in Tehulederie and 12,175 to 27,859 in Kallu, with an estimated average target population of 22,126 and 45, 876, respectively. The coverage ratio in the 2021 registration period was 65.5% in Tehulederie and 58.5% in Kallu. The five-year enrollment trend of the scheme in both districts is displayed in Table 9. In Tehulederie district health insurance scheme, population coverage dropped from 65.7% in 2017 to 62.9% in 2018 and 51.3% in 2019. It increased back to 60.2% in 2020 and 65.5% in 2021. In 2018 and 2019, a negative growth ratio of 1.3% and 17.6% was observed, while a positive growth ratio of 18.3% and 3.7% was recorded in 2020 and 2021, respectively. The renewal ratio ranged from 76.7% in 2019 to 96.6% in the 2021 registration period.

Table 9: Coverage, renewal and growth ratios of CBHI membership (2017–2021) at two districts of northeast Ethiopia, 2021

Year	Tehulederie			Kallu		
	Coverage ratio (%)	Renewal ratio (%)	Growth ratio (%)	Coverage ratio (%)	Renewal ratio (%)	Growth ratio (%)
2017	65.7	89.9	-	27.2	37.0	-
2018	62.9	94.3	-1.3	57.9	68.3	116.3
2019	51.3	76.7	-17.6	50.3	56.8	-11.7
2020	60.2	80.5	18.3	60.0	63.6	19.8
2021	65.5	96.6	3.7	58.5	62.6	-2.5

The population coverage in Kallu district health insurance scheme was 27.2% in 2017. It increased to 57.9% in 2018 and dropped back to 50.3% in 2019. A 60% and 58.5% coverage were reached in 2020 and 2021, respectively. The growth ratio did not show a linear increase or decrease during the period under study. A positive growth ratio of 116.3% and 19.8% was observed in 2018 and 2020, while a negative growth ratio of 11.7% and 2.5% was achieved in 2019 and 2021, respectively. The renewal ratio ranged from 37% in 2017 to 68.3% in the 2018 registration period. Figure 8 depicts the enrolment trend of the two schemes over a five-year period.

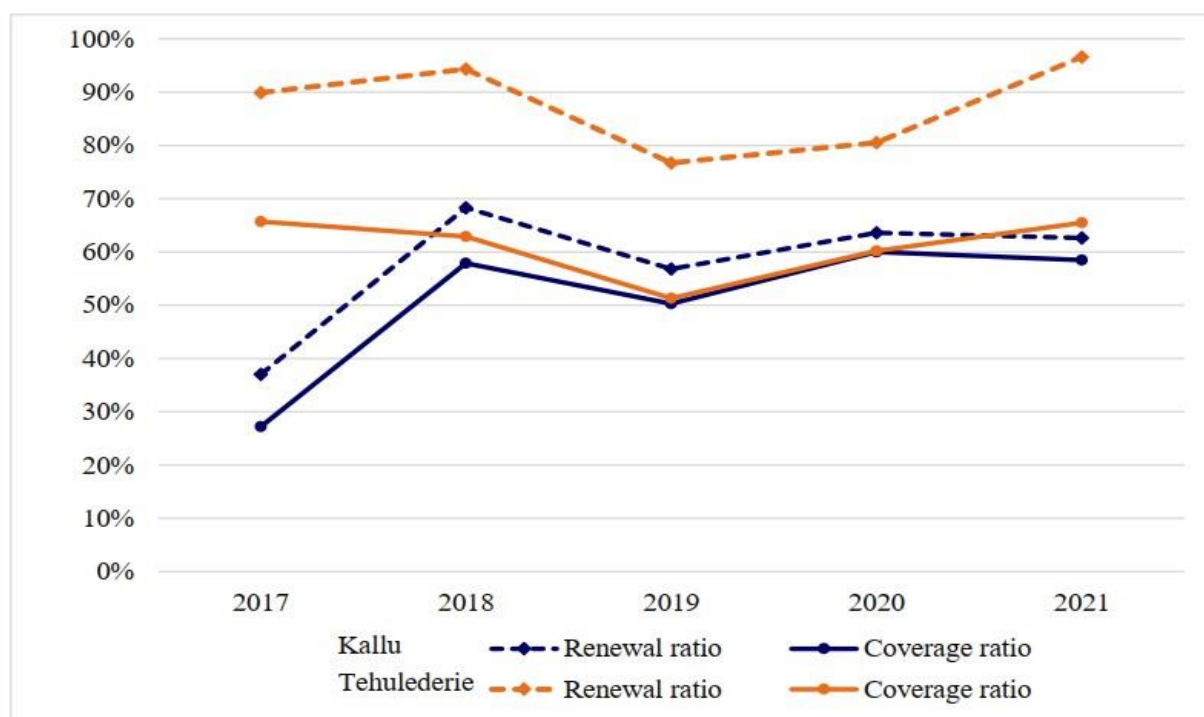


Figure 8: Trends in community-based health insurance enrollment in two districts of northeast Ethiopia between 2017 – 2021.

6.3.2. Challenges to membership development

While each case study site is assessed as a unique implementation of the CBHI, integrating findings from the two case studies allows for the identification of key common themes. Four main themes were identified, which are quality of health care, claims reimbursement for insurance holders, governance practices, and community awareness and acceptability of CBHI. Figure 9 displays the main themes and sub-themes identified during the coding process.

6.3.2.1. Quality of health care

6.3.2.1.1. Availability and perceived quality of medicines

Unavailability of medicines was the most frequently discussed issue in all interviews. Due to the unavailability of medicines in contracted health centers and hospitals, insured patients were usually given prescriptions to buy from private pharmacies, and made to spend OOP or forgo treatment if they were not able to afford its cost. In addition to health service users, HCPs and health center directors from both districts were well aware of the depth of this problem.

“The biggest problem now is that there is a shortage of medicines in all health centers that provide services to insured patients, and most patients have to purchase their medications from private pharmacies at a higher cost.” (KII-5, health center director)

“... There was another patient admitted to the hospital. Several medicines were prescribed by his doctors, but he was unable to obtain them from the hospital pharmacy. Regrettably, he arrived at the hospital without cash, relying solely on his health insurance card. He eventually left the hospital without receiving any treatment.” (IFI, current member)

In addition to medicine unavailability, study participants among the community believe that medicines provided at health centers are of poor quality. The majority of insured patients fail to take their prescribed medications as directed, which may be due to a lack of faith in their quality. Contrary to this, HCPs disagreed that this was the community's judgment based on their preferences, expectations, and level of awareness regarding medicines.

In general, the community prefers injectables over pills and compares medicines prescribed in public health facilities to those prescribed in private clinics. In public facilities, medicines are prescribed based on the standard treatment guidelines, whereas in private clinics, fast-acting injectables, and new generation medicines with brand forms are prescribed for most patients. However, the wider

public is unaware of the benefits and risks of these approaches. Furthermore, health facilities are reimbursed for services rendered per the standard treatment guidelines.

“I recover from my illness quickly if I get injectables. I don't like swallowing medicines; it does not cure me. Why should we take their rotten medicines?” (IFI, current member)

6.3.2.1.2. Perception on health care providers' attitude, behavior, and competency

One of the major concerns in the service delivery process of contracted health facilities is the perceived discriminatory treatment of insured patients in favor of paying patients. Health service users stated that HCPs would negatively judge, label, verbally abuse, humiliate or belittle them owing to their insurance coverage. Some HCPs have also been accused of lacking good human relations, behaving rudely, speaking to patients in an unprofessional manner, lack of empathy and caring attitude, and neglecting to assist them.

“My mother became ill and I took her to a health center, they (the health care providers) gave priority to paying patients while we waited for care. The one who has money is getting ahead, and the one with health insurance is waiting long.” (IDI-5, previous member)

“The problem now is that health workers prioritize paying patients and delay insured patients despite they get very sick.” (KII-18, Kebele leader)

The HCPs admitted that they may not demonstrate excellent interpersonal communication or spend enough time examining and discussing patients' health concerns due to the increased workload associated with insurance coverage. They disagreed, however, on the assertion that insured patients are treated differentially in favor of paying patients. According to them, insured individuals associate everything that happens in health facilities with their insurance status. The insured believe that HCPs have abandoned them and that paying patients are given higher priority, based on the notion that insured clients attend health facilities for every minor ailment because of free health care. This is perceived discrimination, most of which seems not to happen, and such issues were common during the early stages of CBHI, when HCPs were unfamiliar with the program, as most key informants stated.

“My wife got sick and we went to a health center for consultation. They told us to go to a hospital without a referral letter. I told them that if they did not write the referral letter, the hospital would refuse us. They told me something wrong, they insulted me. The health center is just a name, it is

.... It is not considered as if it is existing. Not complete treatment, let alone they do not speak a good language.” (IDI-5, previous member)

“Patients expect you to examine them thoroughly and do laboratory tests. This is the only way to make them happy. However, due to the high volume of patients, we are unable to fully deliver these services. ... some clients allege, ‘they provide me medicines chopped into parts because I am a health insurance beneficiary’.” (KII-9, HCP)

Furthermore, some participants believe that HCPs in health centers lack the skills and experience to manage their conditions. They claimed that the prescribed medicines do not much the disease, providers treat patients without a physical examination or laboratory tests and those working in rural areas are inexperienced. As a result, most insurance holders distrust HCPs and believe they are not there to assist them. As stated by HCPs, insured patients are not willing to accept professional advice and suggestions because they believe that providers are in opposition to them.

“The health center is structurally sound, but it is devoid of competent personnel. It's possible to conclude that it's empty.” (IDI-6, current member)

“We insurance subscribers are frequently blamed by HCPs. As a result, we assume they have an unfavorable attitude toward us and treat us badly.” (IFI, current member)

6.3.2.1.3. Access to hospital services

Health service users expressed a variety of concerns about access to health services at the referral hospital. These include long waiting times, being made to pay in the event of an emergency if they don't have a referral letter from health centers, long appointments for non-emergency conditions, and service denial due to payment and contract issues. Even though CBHI subscribers are entitled to hospital services without a referral letter from health centers in an emergency, they are either forced to pay the treatment fee or denied the service if they are unable to pay. In such conditions, some scheme members prefer private hospitals to seek immediate care. Due to its inability to offer immediate care, even those who adhere to the required referral pathway did not trust the referral hospital on emergency care.

“I had a sudden illness before. I get better off with IV drugs in private hospitals. If I go for medical treatment using a health insurance card, I would die because they do not treat me right away.” (IDI-2, current member)

“Something is worrying you; the scheme is helpful for follow up treatments, but it is useless for emergencies. Many people believe that in the event of an emergency, treatment at a private hospital is mandatory.” (KII-18, Kebele leader)

Regarding non-emergency conditions that require some medical procedures, patients who do not want to wait for extended appointments prefer private hospitals, but they are subjected to higher medical bills.

At the hospital level, it is very challenging to receive the necessary care because patients frequently have lengthy appointments. Many people are getting impatient due to this lengthy appointment. To receive immediate care, they go to private hospitals, which forces them to spend a lot of money. (IFI, current member)

I got sick of my eyes and the health center referred me to a hospital. The Hospital kept reassuring me by making repeated appointments. I could not wait for a long time. Hence, I decided to get treatment at a private hospital. (IFI, current member)

Patients are also required to buy medicines in private pharmacies despite they are available in the hospital pharmacy, according to some study participants. This is particularly common among individuals who seek exempted services at the hospital. Moreover, the insured were denied to receive free health care due to absence of contract agreement between the scheme and the hospital as a result of delays in claims reimbursements.

“Insured patients have been denied health services for more than three or four months in the hospital due to delays in claims reimbursements service charges.” (KII-14, HEW)

6.3.2.2. Claims reimbursement for insurance holders

6.3.2.2.1. Delay in claims reimbursement

The issue of delays in claims reimbursement appears to be another major impediment to CBHI implementation in both districts. Almost all respondents indicated that a delay in claims reimbursement was one of the key problems experienced by insured households. In Tehulederie, clients are frequently scheduled for several appointments and repeatedly travel to the health insurance office. They must also wait in long queues at the scheme's office to have their claims processed. To this end, they incur higher transportation costs and waste their time. Members opt not to submit smaller claims because of the extra costs of claims processing. The latter one is not a

common issue in Kallu district, where reimbursements are made by HEWs at each *Kebele*. The HEWs collect medical bills from scheme participants, process payments at the scheme office, and disburse the money to participants. Although this reimbursement approach worked well in Tehulederie district, later HEWs abandoned it because of the increased workload and their fear of being held accountable, arguing that they had no obligation.

In addition, claims settlement delays are likely to result in the loss of documents and the closure of the fiscal year, which leads to claim rejection. According to scheme personnel, the delay was mainly caused by a budget deficit and a medical auditing process that must be completed before claims can be reimbursed.

“There are situations when reimbursing claims is too late. Several scheme members struggle for six, seven, or eight months and more until the end of the year, after which it is impossible to receive their claim. I don't mean to say that they have been completely denied, but people are getting increasingly frustrated...” (IDI-1, current member)

“We are advised to travel to the CBHI office to collect pocket money replacements. However, we are incurring additional transportation costs, even in exchange for small reimbursements. As a result, many people choose not to request claims less than 100 Birr [Ethiopian Birr].” (IFI, current member)

6.3.2.2.2. Claims rejection

According to the majority of the IDI participants, another concern they faced regarding pocket money reimbursement was claims rejection. They expressed their dissatisfaction by alleging that, despite submitting all required evidence, the scheme rejected their appeals for a variety of reasons. Scheme personnel also acknowledged that claims rejection is common for many reasons, most of which stem from clients' misunderstanding of the kind of paperwork they should submit with their claims. They also disclosed that members of the scheme were unwilling to accept the rejection decision, regardless of the cause.

Presenting with illegal bills from private pharmacies, presenting bills from private pharmacies without attaching prescription papers from contracted facilities, a mismatch between medications prescribed by physicians and those dispensed by private pharmacies, the prescription paper lacking the required signature and stamp, submitting claims after a deadline has passed, receiving treatment from a health facility that did not make a contract agreement with the scheme, receiving treatment in

hospitals without being referred by health centers, and loss of submitted documents were some of the main reasons for claims rejection. One reason for the loss of submitted documents, according to a HCP is that documents submitted by clients are likely to be disguised on purpose, especially for larger claims, because in some cases, there are players between the scheme and its members for claims processing. This is to refer that fact that HEWs collect medical bills from scheme participants, process payments at the scheme office, and disburse the money to participants at their office.

“Last year, the referral hospital refused to sign a contract agreement with the scheme. Insurance members were unaware that the deal with the hospital had not been reached. They sought medical treatment, paid the bill, and then requested reimbursement, but their claims were rejected.” (KII-13, HEW)

“Every month, I have a follow-up appointment for hypertension treatment in a hospital. When the hospital's pharmacy is out of medicine, I buy it from private pharmacies. Surprisingly, I've never been reimbursed for my pocket money. I gathered all past bills and attempted to get reimbursed, but they said it was too late and rejected my request.” (IFI, current member)

“We conducted a medical audit and rejected a lot of claims due to submission of illegal documents.” (KII-16, scheme personnel)

6.3.2.3. Governance practices

6.3.2.3.1. Political will and commitment

The study participants expressed a variety of concerns regarding the governance system of the scheme. One of the scheme's governance challenges is the lack of attention paid to its execution by higher-level authorities. Health insurance is only taken into consideration by higher authorities once a year during membership registration, after which no one is interested in supporting the scheme. They are unwilling to work together to solve the many problems that arise during implementation. According to some key informants, their primary concentration is on increasing the number of subscribers, rather than striving to serve the needs of the community. Due to a lack of technical and material assistance, scheme administrators were unable to undertake proper medical audits. Furthermore, the workload associated with the implementation of health insurance is not taken into account when it comes to equipping health facilities with the necessary infrastructure and personnel.

“The government did not pay attention to the implementation of health insurance. Although it is a useful institution, it has been neglected. Regional and zonal bodies appear only during the renewal period. For them [higher officials], health insurance is a campaign that only takes place once a year.” (KII-15, scheme personnel)

District CBHI schemes have been organized and are working within the district health office, which acts as both a provider and a buyer of health care. However, key informants believe that the current structure poses challenges to the scheme's performance. They claimed that a single sector should not be both a provider and a buyer of health care, because it creates accountability concerns. They proposed that health insurance be organized as a separate autonomous sector with clearly defined roles and responsibilities, as well as a mechanism that allows active engagement of other sectors in the district. In their interaction, the service seller would be accountable for the quality of health care provided to the insured, while the service buyer would be accountable for appropriate claims settlement.

“Do you think the health office would sue the health center if scheme members are not treated properly? Would the health center sue the health office if the service charge is not reimbursed timely? Is it possible for one pocket to sue the other? This is something unscientific. This is what makes the scheme ineffective.” (KII-1, district health officer)

6.3.2.3.2. Insurer moral hazard

Insured households are also unable to receive the full range of CBHI benefits due to a lack of awareness of the procedure they should follow. The community members who took part in the interviews claimed that the community is not fully aware of important directives on how to leverage the scheme's benefits. This is the main reason for the high claims rejection ratio that has been reported.

“The aim of health insurance is to be profitable. The community was unaware that the scheme would reimburse pocket money. The insurer does not want the public to know. The community became aware of this directive after a long period.” (IFI, current member)

According to the participants, another governance concern is that the rules governing CBHI are being violated, as a result of which members are losing their benefits. The provision of health care to members and their families begins when the coverage ratio at the district level exceeds 60% of the target population, according to the bylaw. Participants in Kallu district complained that this rule is

enforced at a *Kebele* level. As a result, certain *Kebeles* that did not achieve this objective were denied health care coverage for more than two months, including households who paid the premium. Some even object to the rule arguing that the rule limits the benefits of subscribers, and stated that once a person pays the premium, he or she has the right to receive the full benefits of the scheme immediately.

“This year, certain segments of society have yet to benefit from health insurance. This is because the Kebeles' membership coverage is less than 60%. As a result, persons with chronic health conditions would pay for the health care charge for a month or two without insurance coverage, even if they renew early.” (KII-9, HCP)

“After paying the premium, we must wait two months before receiving health care until everyone has been enrolled. Our family probably would get sick within the two-month timeframe. Meanwhile, we are going to spend some money. In addition, I may not require treatment then after.” (IDI-8, previous member)

At the time of this study, the release of a new guideline on the implementation of claims reimbursement for the insured was a hot topic. The regional health bureau released a directive stating that claims reimbursements should be made at the price set by public health facilities, which is far lower than the price in private institutions. Stakeholders participating in the implementation of CBHI have voiced worries about the impact of the directive on future membership growth efforts as well as the risk of undermining benefits for scheme members. Let alone this directive, the community was not satisfied with the existing reimbursement system. It would be another major impediment to the community's participation in the scheme.

“If the current law about pocket money reimbursement remains in place, no one wants to join health insurance. For example, one member spent a treatment cost of 5,000 Birr, but he was only paid 1200 Birr based on the new rule. 'What is the importance of health insurance?, what happens if I abandon the insurance and pay for my medical care?' he said.” (KII-15, scheme personnel)

“..., why do people suffer? If this is the case, we do not need to be covered by health insurance. When you're sick, it's better to go to a private facility. Either the government must provide all services through its health facilities or private organizations must limit the pricing of medicines. Otherwise, we will not find anyone to register in the future.” (KII-18, Kebele leader)

6.3.2.3.3. Imposed enrollment

Members of the community complain that, despite participation being voluntary, the *Kebele* leaders are forcing them to enroll and renew their membership. *Kebele* leaders, HEWs, and scheme administrators have also admitted that there is some form of “positive enforcement” for membership enrollment and renewal. Some argue that CBHI is politicized because refusing to enroll is often seen as a sign of opposition to government policies.

“We are being forced to pay the health insurance membership fee by Kebele leaders. They will refuse to receive labor tax if we do not pay our health insurance contributions in advance, and if we refuse, we will be jailed. If they force the community, it appears to them that they are being forced for the government's advantage rather than their own.” (IFI, current member)

“..., when you see the majority, they are forced by the Kebele leaders, and we are going home to home and ask them to renew their membership.” (KII-14, HEW)

“People should join health insurance voluntarily. If they are forced to join the scheme, and they become upset over something in the health facility, they will complain that something big has happened and are prone to quit their membership.” (KII-9, HCP)

According to a *Kebele* leader from a high-performing area, *Kebele* administrators' commitment is vital to membership development. He stated that his *Kebele* was able to achieve higher insurance coverage as a result of his dedication and never-ending efforts to address challenges in protecting scheme members' benefits. He believes that enforced enrollment has no place in achieving effective insurance coverage.

“Despite it is not my obligation, I inquire as to why the health center does not provide proper service while we are urging people to enroll. No one ever turns me down for enrollment since they know how enthusiastic I am about it. Anyone who believes I am on his side will put their faith in me. They pay attention to what I have to say. If you support them, they will stand with you. They may suffer due to events beyond our control, but we must do everything we can to assist them. Why do they pay the premium for the next year if you take the membership fee and remain quiet while they are oppressed and crying?” (KII-18, Kebele leader)

6.3.2.4. Community awareness and acceptability of CBHI

6.3.2.4.1. Community awareness

Other scheme performance challenges are emerging from the community's low awareness and unfavorable attitude regarding health insurance. There is low awareness of the type of services they are entitled to receive, the capacity of contracted health centers, the principles underlying CBHI, and the steps they need to follow to secure their benefits, especially for claims reimbursement.

People who are insured have higher expectations of the health services and believe that they are entitled to receive any service under the terms of their insurance coverage. When their expectations are not met, they tend to blame the system and terminate their membership. Some members of the scheme are also unaware of the notion of solidarity. They wish to receive the benefits of the scheme in exchange for their contributions.

“Some people claim that ‘If I don't get treated, what is the benefit of health insurance?’ because the year passes by without treatment. It will, however, benefit them in an emergency. It's due to a lack of understanding.” (IDI-6, current member)

“If health insurance is voluntary, no one will renew the membership in our Kebele, except those with known health problems. They have no desire for mutual support, but rather have a desire to be supported. Some people re-enroll after dropping out of health insurance when they need health care.” (KII-12, HEW)

6.3.2.4.2. Acceptability of CBHI

Most of the interviewees stated that health insurance is not well accepted in the community. Certain members of the community did not value the benefits of health insurance. For some of them, CBHI is a political instrument that isn't being used for the community's benefit. They stated that they are paying the premium not to be different from the rest of the population and to avoid confrontation with the *Kebele* leaders. Others are renewing their policy to maintain their relationship with *Kebele* leaders and HEWs who are mobilizing the community. Even some of the insured seek health care in private clinics at their expense, and others pay the premium without renewing their membership cards.

“The community is not interested to enroll in health insurance. We are literally begging people to subscribe or renew their membership. When we visit the community during the renewal time,

some residents close their doors and hide. They don't want to hear our voices at that time. They don't want anyone to bring up the topic of health insurance in general.” (KII-12, HEW)

“We pay a health insurance membership fee to keep ourselves connected to the rest of the community. Many people pay the membership fees, but never receive the membership card; they do so to avoid being accused by Kebele leaders.” (IDI-8, previous member)

“Health insurance is a deception, it simply serves to collect fees and instigate disputes among farmers. The Kebele leaders urge us to become a member of health insurance, it seems we have enrolled into something that we did not know exactly.” (IDI-5, previous member)

6.3.2.4.3. Rumors and misinformation

Another concern that prevents people from joining or adhering to the scheme is the spread of misleading information in the community. Health care delivery and insurance-related problems are widely publicized; some are exaggerated, while others are rumors or misinformation. When something goes wrong with health care or insurance services, word spreads swiftly throughout the community. Even those who have not encountered the situation appear to be lamenting it as though it has happened to them. In addition, people attempt to portray a distorted image of the community's true problem. Rumors and misinformation concerning health care delivery and insurance services quickly circulate throughout the community, with some emanating from private clinics to attract more consumers. Even an issue that occurred at the time of the introduction of the scheme is still rumored in the community as a fresh problem, although it was already resolved.

“Another is the propagation of rumors in the community. If a person faced a problem related to health insurance, he or she can take it to the community and spread it misleadingly. Such rumors are more likely to be heard in society than the stories of people who have benefited from the scheme.” (KII-2, health center director)

“Rumors and misinformation are widely accepted in the community and are often used to discredit health insurance; nevertheless, good things are rarely acknowledged.” (KII-1, district health officer)

Surprisingly, the community, including those who have left out and are criticizing the scheme do not want health insurance to be abolished, because they know that they will be able to rejoin and benefit from it at a later point in time.

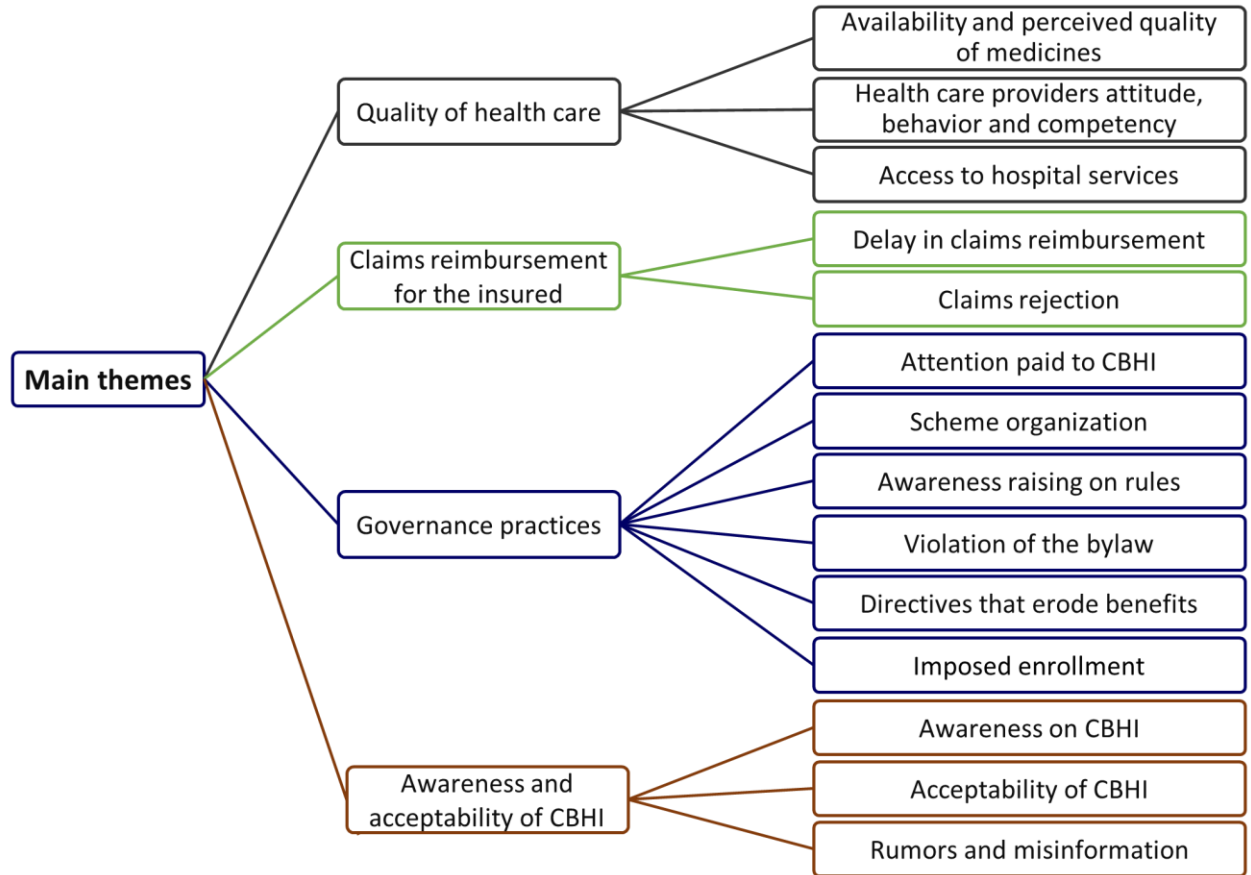


Figure 9. Main themes and sub-themes (challenges impeding membership growth) at two districts of northeast Ethiopia, 2021

6.4. Financial viability of CBHI (Objective IV)

6.4.1. Brief description of revenue and expenditure data

The health insurance scheme in Tehulederie district collected total revenue of 22.25 million Ethiopian Birr (ETB) equivalent to \$877,403.60 from the 2014 to 2020 fiscal year, of which 32.25% was from a government subsidy. The total expenditure in that period was 22.60 million ETB (\$917,314.02) of which almost all (99.36%) was incurred for medical bills. During the period, the scheme had a negative net income of 7.53 million ETB (\$330,949.13) before subsidies, and 350,593 ETB after subsidies.

In Kallu district, the scheme collected 27.50 million ETB (\$1,011,537.52) in the same period, of which 29.26% was from a government subsidy. The total expenditure was 28.39 million ETB (\$1,020,607.36). Claims cost accounted for 89.50% of the total expenditure. A negative net income

of 8.94 million ETB (\$313,466.97) was recorded before subsidies, and 893,275 ETB after subsidies. Figure 10 displays the trends in claims costs of the scheme in contrast to contributions from members and government subsidies. To display the trends, we converted revenues and expenditures to US dollars using the exchange rate on the last business day of each fiscal year, allowing us to examine the actual change in revenues and claims costs over time.

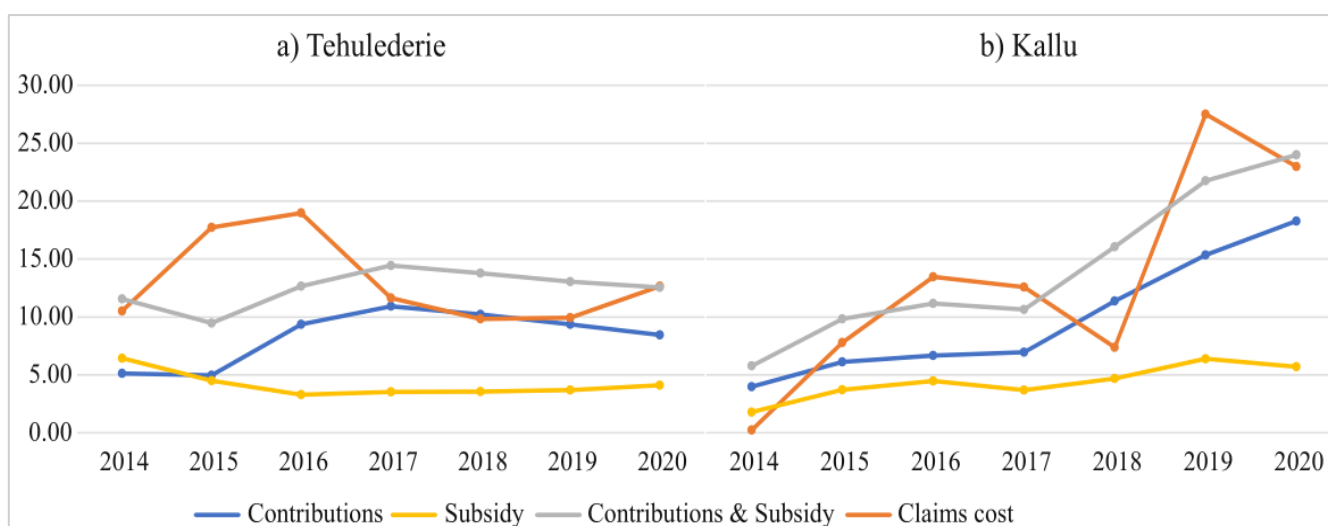


Figure 10: Trends in claims costs, contributions and government subsidies at two districts of northeast Ethiopia, 2021 (2014 – 2020, USD)

6.4.2. Claims and net income ratios

The trends in claims and net income ratios of the two schemes are displayed using Figure 11. In Tehulederie health insurance scheme, the claims ratio was 2.05 in the 2014 reporting year, which meant that for every 1.00 ETB of contribution received from members, on average, the scheme spent 2.05 ETB on claims. The ratio increased to 3.57 in 2015 and fell again to 2.03 and 1.07 in 2016 and 2017, respectively. A claims ratio of less than 1.00 (0.96) was documented only in 2018. This means that the scheme office spent more than it received in the settlement of claims in all the periods under the study, except in 2018, as a result, the net income remained negative in all these periods. The average claims ratio over the period under study was 1.50, while the average net income ratio was -0.50 (ranging from -2.56 in 2015 to 0.02 in 2018).

The claims ratio in Kallu health insurance scheme increased sharply from 0.06 in 2014 to 1.27 in 2015 and 2.02 in 2016. The ratio dropped slightly to 1.81, 1.79, and 1.26 in 2017, 2019, and 2020, respectively, with a significant decline to 0.65 in 2018. The average claims ratio over the period

under study was 1.34. The scheme experienced a loss in all the reporting periods, except in 2014 and 2018. The average net income ratio was -0.47 (ranging from -1.13 in 2019 to 1.07 in 2014).

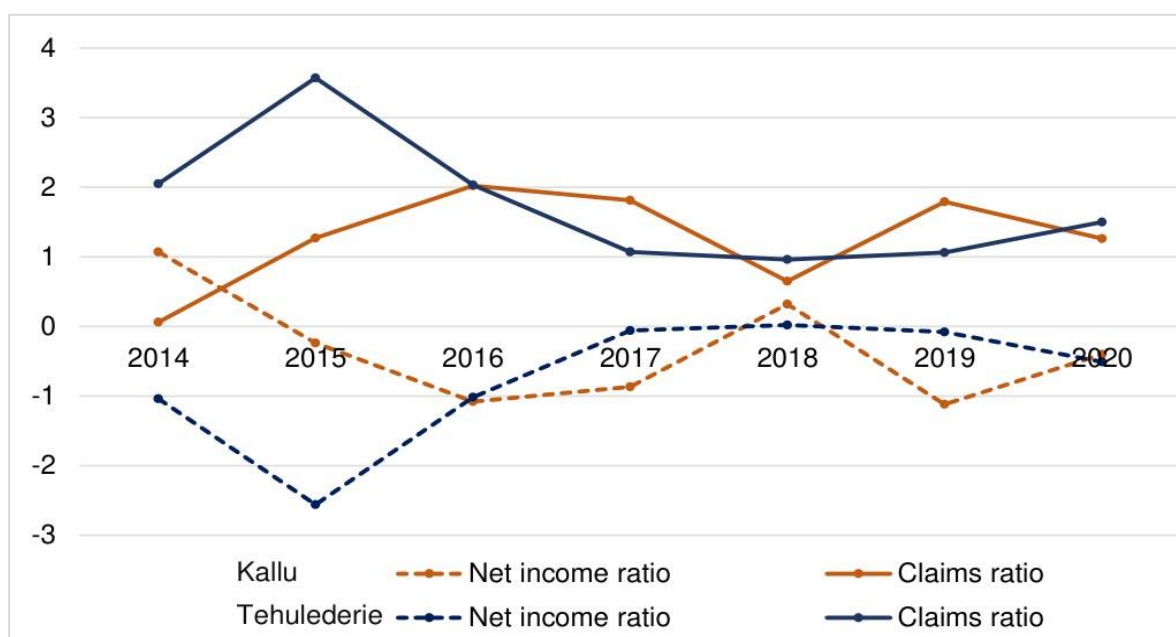


Figure 11: Trends in claims and net income ratios at two districts of northeast Ethiopia, 2021 (2014–2020)

6.4.3. Challenges to financial viability

Based on analysis of the qualitative data, five main themes were identified, which are adverse selection, moral hazard behaviors, frequent stockout of medicines, delays in claims settlement for service providers, and low insurance premiums. Figure 12 depicts the networks of the themes identified through the thematic analysis, along with their connections to the scheme's financial performance indicators.

6.4.3.1. Adverse selection

The study's participants were interviewed to explore which parts of the community are more willing to enroll in CBHI and adhere to it. High-risk households, such as those with a chronic disease or condition, people with a disease that requires advanced surgical procedures, as well as the elderly, are more inclined to join and stay with the scheme. Without being mobilized, such households urge the scheme administrators to renew their subscriptions. On the other side, healthy households show less interest in joining the scheme or renewing their subscription. Surprisingly, they re-enroll in the system after dropping out if they develop a chronic disease or medical issue that requires more expensive treatment, and they quit again when they no longer require care.

“I was a member of health insurance, I enrolled because my father had a chronic illness. I thought it would be useful to treat him, but now he is dead, hence I quit my health insurance.” (IFI, previous member)

“People with chronic illness need to renew and pay the premium on time. The insurance scheme went bankrupt due to the high claims cost of such members.” (KII-16, scheme personnel)

Households with large sizes are also more inclined to participate in the scheme. Furthermore, according to the study participants, partial enrollment of family members who require more health care is normal in the community to avoid additional premiums for households with more than five members. Another related issue is that two families attempt to be covered under health insurance as if they were one family, and enroll individuals with higher health care needs selectively. This was mainly due to the fact that the family structure that existed since the initiation of health insurance was not revised.

“There may be relatives who live nearby, people who can agree, and sick people from both families would be selected and enrolled as one family. They attempt to be members in this way in our Kebele.” (KII-19, Kebele leader)

6.4.3.2. Moral hazard behaviors

6.4.3.2.1. Patient moral hazard

Following the implementation of CBHI, there has been an increase in the use of health services in general. Aside from that, the key informants revealed that insurance members engage in a variety of moral hazard behaviors that undermine the scheme. The most prominent one is returning to a health facility for the same ailment repetitively without following through on a treatment plan. Patients who are unable to obtain the medications they want mostly return within one to three days of treatment. Even some came back in the afternoon or at night after being treated in the morning, assuming that another care provider would meet their desires. Such clients usually confront with HCPs unless their medication is modified per their wishes.

This practice has been inextricably linked to the waste of medicines. When insured patients are not treated as they expect, some throw their medications and go away in a rage, while the majority receive the medications, but do not take them as prescribed. As a result, most insured people have medicines stored in their homes. This is one of the main reasons for medicine stockouts at health centers,

according to HCPs. Overall, insured patients tend to request HCPs prescribe the medications they want and write a referral letter to a hospital regardless of their condition. They try to exert undue pressure on them to get whatever they want because they believe that they are entitled to receive any health service under the terms of their insurance coverage.

“They think that they would be better off with a single dose, and if they are not getting improved, they come back immediately without completing medicines. There is a tendency for people to press us to write prescriptions in any way they wish.” (KII-10, HCP)

Other moral hazard behaviors include seeking medical attention for every minor ailment, leaving the health center unattended after retrieving medical cards when the waiting time is long, bringing the other family to a health center for a checkup while one is sick, attempting to collect medicines for the uninsured, visiting different health centers for the same illness within the same period, attending health care facilities ahead of time for follow-up appointments to reserve medicines for use when coverage expires, and in case of medicine scarcity or to share with someone who is not insured. The latter is common among patients seeking chronic care follow-up, especially when medicines are scarce at contracted health facilities.

“Insured patients visit health facilities for minor cases, because of having health insurance. This is one of the reasons for the financial loss of the scheme. ...they receive treatment at one health care facility today and then visit another without seeing the results of that treatment. On the third day, they see it again and go to another health center.” (KII-16, scheme personnel)

“...a patient visited our health center for five consecutive working days. He was given different medicines every day he came in. Why was he doing that? Surprisingly, some clients present with the symptoms of uninsured individuals, and collect medicines for them.” (KII-3, HCP)

“They keep hypertension medicines at home, they come here to receive more, and inform you that they have finished the previous one...they may return before the treatment is completed to have a reserve.” (KII-9, HCP)

Some key informants indicated that after receiving medicines from a health center, insured patients are caught selling them to private pharmacies. On the contrary, some of them stated that such behavior was common during the early stages of the program, and they do not expect it to happen nowadays, because medicines are even unavailable for their treatment.

6.4.3.2.2. Provider moral hazard

Moral hazard behaviors are not exclusive to insurance beneficiaries. According to key informants, some HCPs were involved in practices that entail moral hazards. These behaviors include ordering expensive medicines and diagnostics, over-prescription (prescribing antibiotics while it is not required), and prescribing medicines intentionally for a patient without completing what has been provided before.

“Doctors consider treatments as a luxury if a patient is insured. Patients who are insured are given more services than they need. For example, ordering a CT scan when an ultrasound is adequate to make a diagnosis. This is really happening. Doctors are doing this because they believe it will benefit patients, as diagnoses will be easier.” (KII-3, HCP)

A key informant who was working as a medical auditor also disclosed that doctors in hospitals write prescriptions for uninsured patients in the name of the insured. When uninsured patients cannot afford medical care, doctors write prescriptions in the names of insured patients admitted to the same ward. Doctors have even been accused of prescribing medicines for one another in the name of a patient with health insurance.

“When they want to help someone unable to pay, they prescribe extra medicines for the insured and administer them to the uninsured. They write the required prescriptions on behalf of the insured patient. This is a common practice at hospitals.” (KII-3, HCP)

6.4.3.3. Medicines stockout

The most common issue expressed by all participants was a shortage of medicines. Because medicines were often unavailable in contracted health facilities, prescriptions were issued to insurance cardholders to buy them elsewhere at higher prices, forcing them to make OOP spending or forego treatment if they couldn't afford it. Service providers in both districts were fully aware of how critical the issue was. The two main reasons for medicine stock-outs at health centers were a lack of budget and the limited capacity of the government's pharmaceutical supply agency. In particular, key informants emphasized the pharmaceutical supply agency's limited capacity to meet the demands of health facilities in its catchment area. Because the government's supplier agency frequently runs out of medical supplies, health facilities have been compelled to procure from private wholesalers, which requires a lengthy process and higher price markups, limiting the amount of medicine required to deliver care.

“... however, medicines are not available in health facilities. We are always told to buy it somewhere else. If we rely on our health insurance book and go to a health facility without having money in our pockets in time, we will be in trouble, especially during an emergency. However, because we do not trust health insurance and have cash on hand, we buy medicines from private institutions.” (IDI-1, current member)

“... Last year, our health centers were about to close due to a shortage of medicines.” (KII-1, district health officer)

6.4.3.4. Claims settlement delays

According to both HCPs and scheme personnel, a delay in claims payment for service providers is another impediment to successful scheme performance. Contracted health facilities were working for a long time without getting paid for the services they provide to insured patients. Earlier, health facilities were not reimbursed for service charges for the entire fiscal year. As a result, they frequently ran out of medicines and other supplies, and in some cases, they were unable to deliver essential health services and were forced to shut down the entire operation. Due to claims payment delays, the referral hospital also declined to sign a contract agreement with the scheme. The scheme personnel also stated that this has been the biggest challenge in the implementation of the scheme since its introduction in both districts. Due to the scheme's budget shortfall, both district administrations had to pay medical bills out of their budget in addition to the expected subsidy.

“Health centers have come down financially since the introduction of health insurance. Why? Because the health insurance does not reimburse them for the services they provide on time. As a result, they were unable to buy medicines, they were forced to send patients away, and unable to serve the community as a whole.” (KII-1, district health officer)

“We did not reimburse the referral hospital for the service charges last year, because we could not afford to pay all the medical bills. As a result, patients were denied receiving medical care.” (KII-15, scheme personnel)

Some health facilities also complained that their claims were partially rejected after a medical audit. The scheme administrators acknowledged the issue, stating that service charge claims are partially denied as a result of different audit findings, a problem that occurs frequently in some health facilities. Requesting payment for services not covered by the scheme, such as exempted health services, mathematical errors, requesting payment for clients from other districts and those who are

not insured, claiming service charges for treatments not offered, and the same medicine re-ordered for one patient within the same period, are some of the audit findings that result in service claims being rejected. As revealed by scheme officials, they did not undertake medical audits as planned; nonetheless, if they had conducted a comprehensive medical audit, the rejection rate might have been higher than stated.

“We are not reimbursed for the services we offer within the agreed-upon time frame. As a result, we were unable to procure medicines on time. When the payment is made, it's only a small amount of money, because what we claimed is partially rejected. This is the biggest problem we faced.”
(KII-2, health center director)

6.4.3.5. Low insurance premiums

The low insurance premiums, according to research participants, is one factor contributing to the scheme's financial shortfall. Although some segments of the population find it difficult to pay, the study participants agree that the current premiums are low in comparison to the rising cost of health care.

“Obviously, the funding is insufficient. Our health insurance premiums are a one-time payment for a single visit. When someone sneezes, he go to a health center.” (IDI-2, current member)

“Some people find it difficult to pay the premium. However, in terms of health insurance, it is negligible. It is inadequate to cover the costs of health services.” (KII-18, Kebele leader)

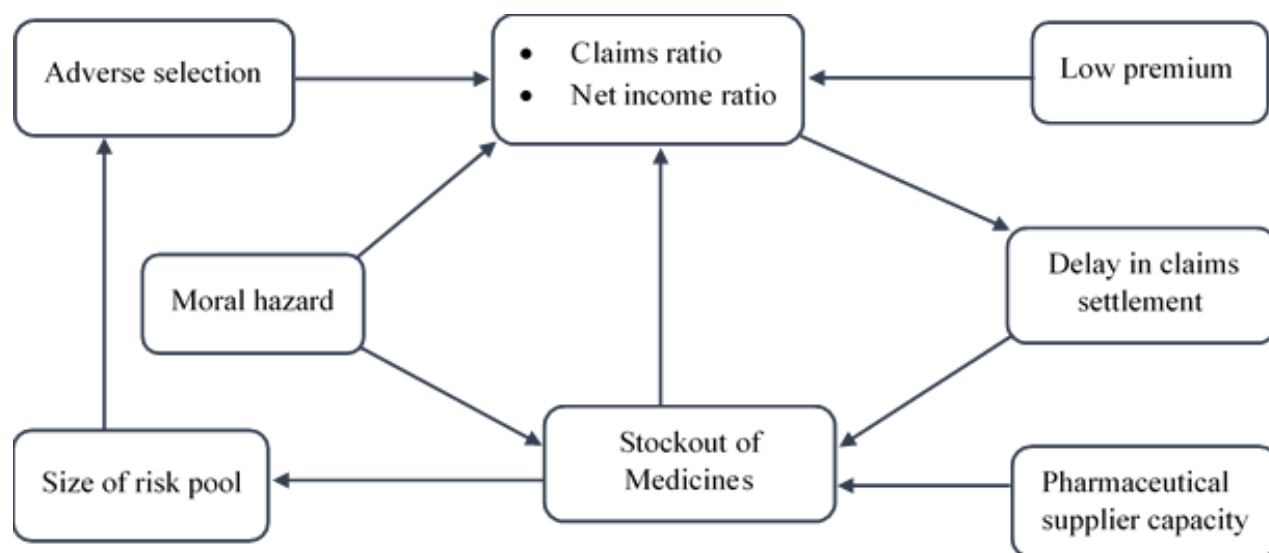


Figure 12: Summary of financial performance indicators of the scheme and challenges impeding its viability in two districts of northeast Ethiopia, 2021

6.5. Challenges to the scheme's performance: summary

The different challenges impeding the membership development of the scheme and its financial viability are integrated as depicted by Figure 13. It links the scheme's performance indicators and underlying challenges hindering its successful implementation. It also shows how the different themes are interconnected with each other. The lack of political will and commitment to the scheme's implementation forms the foundation of the framework, implying that it is the root cause for most of the challenges explored in this study.

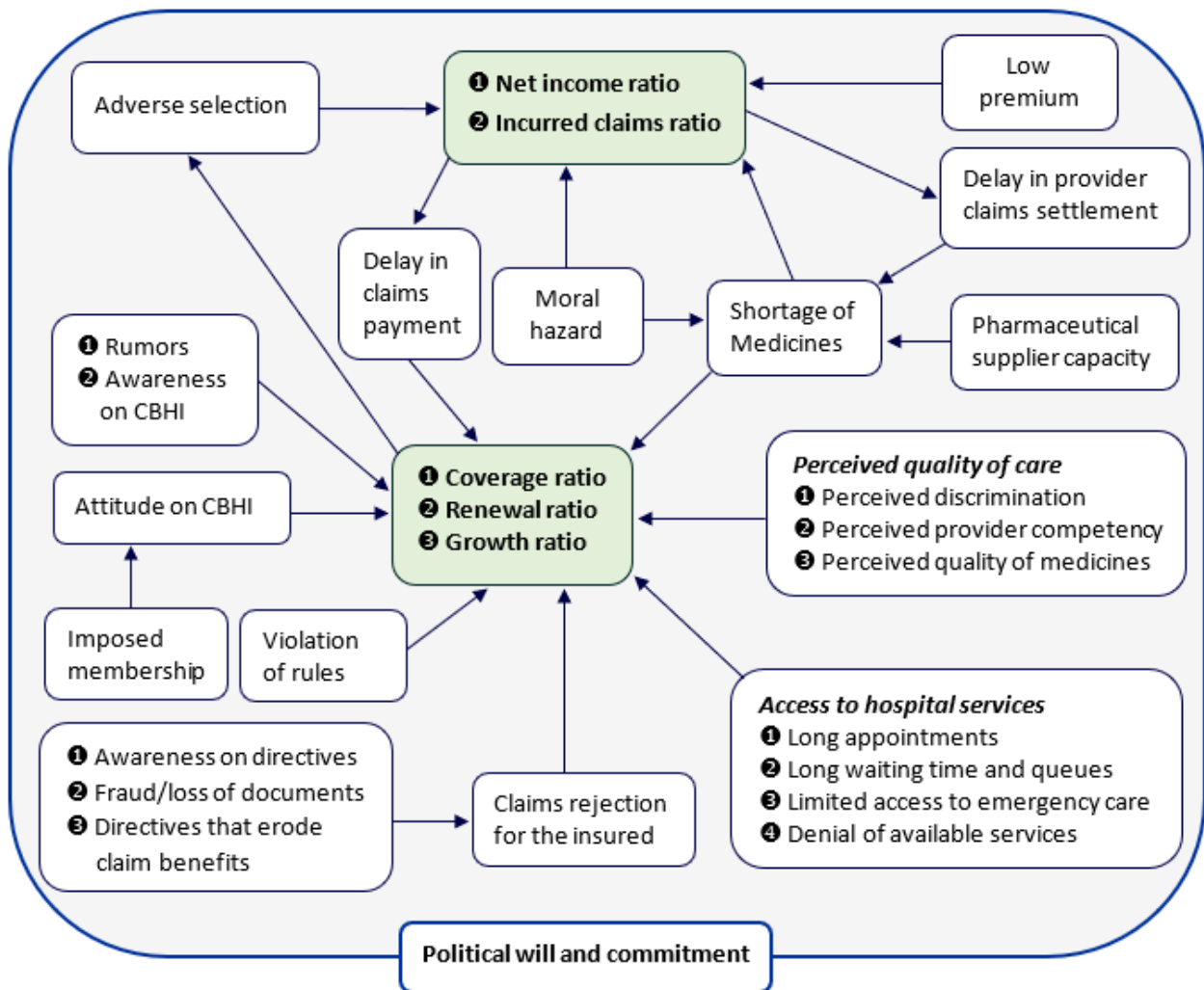


Figure 13: Summary of CBHI scheme performance indicators and underlying challenges impeding its successful implementation (produced by the authors based on qualitative interviews).

7. GENERAL DISCUSSION

7.1. Introduction

This study employed mixed-methods research to answer the research questions mainly through household surveys, desk reviews, and qualitative interviews. The results of the studies are systematically outlined as part of the overall project, and supplemental findings are integrated accordingly. First, using a household survey, the study attempted to examine how long member households adhere to the scheme with a 10-year follow-up period and identify the factors associated with the time to drop out by considering unobserved cluster (*Kebele*) level variables. Second, the perceived quality of health care, which was an important variable linked to both membership adherence and overall membership growth was measured using a household survey and health center level data. Both household-level and health center-level factors linked to PQoC were identified. Third, the study examined the enrollment trends of the scheme (membership enrollment, renewal, and overall membership growth) over five years based on desk reviews, and explored the challenges impeding the membership development efforts of the scheme from the perspective of different stakeholders who were participating in its implementation. Finally, using desk reviews, the study attempted to examine the financial viability of the scheme based on selected performance indicators over seven years and explore the challenges underlying the observed financial deficit from the viewpoint of different stakeholders.

7.2. Continued adherence to CBHI membership

This section of the dissertation investigated how long members adhere to the CBHI scheme, and the factors affecting the time to drop out while accounting for cluster-level variables. Overall, 29% of the study participants had dropped out of CBHI following their initial enrollment in the scheme with an incidence rate of 5.27 per 100 person-year. After adjusting for other independent variables, and keeping households in the same cluster, the results of the multivariable regression analysis revealed a number of factors associated with the time to drop out. Accordingly, married households adhere to the scheme longer compared to their counterparts of unmarried households. This finding is consistent with a study in Ghana, where coupled households were more likely to renew their health insurance membership [43]. This may be the case because coupled households may adopt a shared decision-making approach that may play a part in maintaining their CBHI membership. Contrary to this, another study in Ghana reported that married migrant head porters were significantly less likely to

renew their membership than single migrant head porters [44]. The difference might be attributed to a difference in the study population and scheme design. In the latter study, the study participants were female migrant head porters who were enrolled in the scheme free of charge.

This study found that household size had a positive association with the time to drop out of CBHI. It seems that household size had a localized effect on membership renewal. Different studies reported conflicting evidence on the association between household size and renewal decisions. One study in Ethiopia found that larger households were more likely than relatively smaller households to renew their policy [167]. This finding is also corroborated by a systematic review which showed that household size was a facilitator of renewal decisions [14]. This might be because larger household sizes are prone to higher OOP health care expenditures [168]. Risk-averse households with larger household sizes might prefer to maintain insurance membership to avoid the risk of catastrophic expenditures.

Contrary to our finding, other studies conducted elsewhere reported a negative correlation between household size and renewal decisions [44, 52, 75]. It could be argued that the subscription fees in the schemes investigated by the latter studies were levied according to the size of the household, which resulted in a higher premium for larger households. This in turn might be a barrier to maintaining their membership. That was not the case in the Ethiopian context until the time of this study, where all households with a household size of five or less contribute the same premium (\$8.89 per year) with an addition of only \$1.27 and \$3.30 for the next two levels of contributions for January 2021 enrollment period. Although enrollment was set at the household level to limit adverse selection [48], it appears that the premium design in the context of this study creates some form of adverse selection by retaining relatively larger households that are at higher risk of health care expenditure. Another explanation is the possibility of partial enrollment (enrolling only at-risk individuals like children, elders, and those with illness experiences) to avoid additional payment for a household size larger than five [92]. This was confirmed by the qualitative interviews (as a threat to the scheme's financial viability), which found that partial enrollment of family members who need more health care is widely practiced in the community among households with more than five people. This finding provides lessons for policymakers to devise strategies to attract small size households and minimize potential partial enrollment, which in part can address the problem of adverse selection.

The households' chronic illness experiences also influence the decision to remain in the scheme. Those who lived with a family member who had a chronic illness significantly extended their

membership duration. This is in line with earlier studies that demonstrated a positive association between the presence of chronic illness in the family and renewal decisions [46, 48, 50]. The result mainly indicates the possible existence of adverse selection, which is a common event in schemes where membership is voluntary and contributions are independent of individual health risks [169]. This phenomenon has two implications that are worth discussing here. From the equity point of view, CBHI is promoting health care access to high-risk subsistence farmers who otherwise would be forced to catastrophic health expenditure or exposed to an increased risk of severe complications for those who forgo treatment due to the inability to cover the cost of health care. The second insight is from the scheme's performance and sustainability perspective. The result points out that the scheme is unable to retain healthy scheme members, which raises concerns about the risk profile of members remaining in the scheme. The insurance pool would be left with high-risk individuals who had higher health care needs, for which the premium is insufficient to cover the medical bills, which in turn could hamper the financial sustainability of the scheme [32]. The qualitative findings corroborate this assertion. High-risk households, such as those with a chronic disease or condition, people with a disease that requires advanced surgical procedures, as well as the elderly, are more inclined to join and stay with the scheme, as revealed by interviewees.

This study verified that history of hospitalization, which is both an illness and service utilization indicator, was positively associated with the time to drop out of CBHI. Receiving inpatient service (hospitalization) under CBHI coverage motivates households to extend their membership. A possible explanation for this finding is that those who have been hospitalized under the coverage of the scheme might have enjoyed the benefit of health insurance more than others. They might have received advanced health care that would have cost them excess money or was beyond their ability to cover its cost. Through their experience, they might have the opportunity to learn and understand the basic principles underlying health insurance. Earlier work in India reported that hospitalization under the scheme was negatively associated with renewal probability [42]. The authors argue that the possible reasons could be the poor quality of health care and the negative claims experience faced by scheme members. Hence, scheme managers need to devise mechanisms to maximize the benefit of CBHI to retain their members.

The findings of this study demonstrated that health care quality is one of the key factors in a household's decision to keep participating in the scheme. The perception that health care is of good quality is an important enabler of continued membership adherence which is consistent with the

existing literature [45, 46, 49, 167]. Qualitative studies have also documented different issues linked to the quality of health care as important barriers to membership adherence [67, 77, 79, 80, 84, 86]. This finding is not surprising, as the quality of health care is central to the success of any community-based and micro health insurance initiatives aimed at achieving UHC [8-10]. If the health facilities fail to provide high-quality services, the insured will lose trust in the service provider and the insurance plan and will opt for other care alternatives outside the system [13]. Therefore, members will be unlikely to maintain their subscriptions [14, 15]. This is supported by the findings of the qualitative interviews, which revealed that insurance members' dissatisfaction with the quality of care provided by contracted health facilities was the most significant impediment to membership growth.

In the regression analysis, the household's perception of the ability of CBHI to protect its members from financial risks was significantly associated with continued membership adherence. Households who had a high-level perception of the financial risk protection ability of the scheme had a higher survival probability compared to those with low-level perceptions. This is consistent with the findings of a systematic review, which showed that people's membership adherence decisions were influenced by their perceived financial risk protection [15]. In Ghana, those who believe that joining the scheme will help them to save money from paying hospital bills were more likely to renew their membership [43]. One of the primary purposes of UHC targeted efforts, including community health insurance initiatives, is to abolish the requirements to pay directly at the time of health service utilization [5, 19]. This can be achieved through prepayment and pooling approaches that generate stable and sufficient funds for health, which enable contracted health facilities to provide uninterrupted services [27]. Once members of the scheme paid the premium, they would expect to receive health care without the need to pay at the time of receiving health care. If they are required to pay at the time of health service utilization, they might lose their confidence in the scheme and decide to cancel their policy. Consistent with this finding, the qualitative interviews explored that, people were frequently forced to make OOP spending during service use at private institutions due to the unavailability of medical services in CBHI-affiliated health facilities, and this was one of the key challenges impeding membership growth efforts of the scheme.

The household's trust in the scheme management also played an important role in extending the time to drop out among scheme members. Policyholders who had medium and high-level trust in the scheme had longer adherence to the scheme compared to those who had low-level trust. This means

that subscribers who believe the scheme does good for the community, the scheme will pay for everything it is supposed to even really expensive treatments, the scheme staff are completely honest and reliable, and the staff care about their health just as much or more than they do, remain long in the scheme compared to their counterparts. Our finding is in line with results from prior studies which showed that trust in the scheme was a significant enabler of membership adherence [49, 82, 167]. This finding is also supported by findings of meta-analysis and systematic reviews which revealed that trust in insurance schemes was a facilitator of renewal decisions [14].

An intriguing finding in our study is the role of the wealth index, which showed no significant correlation with the time to drop out of CBHI. The existing literature showed that the socio-economic status of households was significantly linked to membership renewal decisions, regardless of whether it was measured in terms of asset category, expenditure, or income. Households with higher economic status were more likely to renew their policy compared to those with lower economic status [42, 44, 47, 50-52]. This difference might be linked to the study population and premium affordability. Our study excludes indigents who are fee waiver beneficiaries, which otherwise could not adhere to the scheme membership if they were made to pay the premium. A prior study in Ethiopia stated that the bulk of households were able to afford the premiums [48], which might be in part due to the deliberate government efforts to provide a fee waiver for the poorest segments of the population. Another study documented that level of premium affordability was not significantly associated with dropout decisions [167]. A household's ability to afford the scheme is a function of its economic status. As long as premium affordability is not a concern of the population, the economic status of the household might not have a role in influencing continued membership adherence. In line with our findings, recent work in Ethiopia reported that there was no significant link between the wealth index and policy renewal [167]. This finding implies the role of providing fee waivers for indigents in assuring the equity goal of UHC.

To sum up, the findings of this study on some of the factors associated with the time to drop out are consistent with the literature, whereas on some other factors it contradicts the studies conducted in other countries. It could be understood that the study setting, including the scheme design (premium affordability, level of premium contribution per household size, and fee waiver policy) and the study population, which includes only paying scheme members, had an important bearing on the observed discrepancy.

7.3. Perceived quality of care

The perceived quality of health care, which was an important variable linked to both membership adherence and overall membership growth was measured using a household survey and health center level data. Individuals with health insurance will continue to be members if they believe they are receiving the highest possible quality of health care [14, 15]. The household survey revealed that the mean PQoC score was 70.28 on a scale of 20-100 with an SD of 8.39. The patient-provider communication received the highest score ($M = 77.84$, $SD = 10.12$) among the five quality dimensions. In 2015, Ethiopia's five-year health sector strategic plan considered the development of compassionate, respectful, and caring health workers as one of the key transformation agendas, and movements were created around it [170]. Our finding may be attributed partly to the government's ongoing training initiatives aimed at producing health care workers who are competent in this aspect. The perception score for the information provision dimension, on the other hand, was the lowest ($M = 64.67$, $SD = 13.87$). This could be attributed to an increase in patient volume following the implementation of CBHI [171]. Items loaded under this dimension appear less practical in the presence of a larger patient load. If HCPs are required to treat a large number of patients, consultation times will be reduced. They are unlikely to provide the necessary information to their clients if they are under time constraints. Regarding item level observations, waiting time and medicine availability received the lowest perception scores (62.96 and 63.50, respectively), which could also be related to increased patient load. This is in line with earlier studies in Ethiopia, which revealed that clients with health insurance frequently complain about a lack of medicine and long wait times at CBHI-affiliated health facilities [35, 74].

Results of the regression analysis revealed that households with higher wealth tertile had a higher PQoC score than those with lower wealth tertile. This is in contrast to other studies whereby the richest group had a lower perception score [95, 172]. This discrepancy could be partly attributed to the use of different metrics to assess the quality of care. People with higher economic status may be more aware of health issues and able to bargain with HCPs to obtain the best possible care. Furthermore, if prescribed medicines are not available in CBHI-affiliated health facilities, for instance, they can afford to buy from private pharmacies. On the contrary, it might be irritating for people with lower economic status to buy medicines with limited money or to forgo treatment due to lack of money. In this regard, they may develop a negative perception of the quality of care.

Households who were active members of CBHI at the time of the study had a higher rating of PQoC compared to ex-members. Contrary to our finding, a study in Ghana showed that previously insured clients had a higher perception of quality of care compared to actively insured clients (statistical significance is not reported). The authors argue that this was due to the more time-consuming nature of the service delivery processes for insured clients [99]. At least three possible explanations exist for the relationship between CBHI status and PQoC. First, because they do not have to pay for health care, active members have better access to and enjoyment of its benefits, resulting in a favorable perception of its quality. Second, the relationship could be due to an endogeneity issue created by omitted variables. It is plausible that higher quality score reported by active members is due to such variables, as the desire to continue as a scheme member. Third, ex-members of CBHI may have had negative experiences with health services, which led to the decision to discontinue their membership. As a result, they would be critical in rating the quality of care provided. In support of the latter argument, it was evidenced that poor quality of care was a major reason for insurance members to leave the scheme [139, 167]. Elsewhere, a statistically significant association was also reported between dropout and low quality of care [46, 49].

This study verified that the PQoC score of households who rated their health status as very good was significantly lower compared to those who rated it as fair. The households' chronic illness experiences also influence the PQoC rating. The PQoC score of households with a chronic illness was higher compared to those without a chronic illness. This may be true for people who perceive their health as fair or who live with chronic conditions to appreciate the gains or benefits of the health care they received. In this respect, they may be more likely to rate the quality of care higher than their counterparts.

The results also indicated that households who had their most recent visit to a health center before 3-6 months had higher PQoC scores compared to those whose recent visit was within 3-months prior to the study. Patients may experience varying levels of emotional highs and lows, depending on the length of the most recent facility visit. Although patients' perceptions of quality may develop over time [134], patients who have recently visited a health facility may be more critical of the quality of care due to strong emotions attached to negative events or health services that fall short of their expectations. They may recall most events (including negative experiences), become more critical and rate the quality of care as low. Furthermore, there might be seasonal variations in the quality of

health care, which could be influenced by factors like differences in the availability of medical supplies and patient flow.

Our findings revealed that the average work experience of HCPs was positively associated with PQoC. Work experience is linked to task specialization, which can lead to a faster work pace, more output in less time, and higher technical quality. Providers with more experience take less time to make diagnoses and treatment decisions, while still providing recommended practical aspects of care, such as good communication, physical examination, and provision of relevant health information [173]. As a result, they can reduce waiting times, and their management outcomes may be more effective than inexperienced providers. This may be more pronounced in Ethiopia where there has been a sharp rise in patient visits to CBHI-affiliated health centers [171].

Conditional to the average staff job satisfaction, patient volume is negatively correlated with the PQoC. A study in Ethiopia identified a non-linear significant association (an inverted U-shape) between patient volume and quality. Quality decreased with increasing patient volume in health facilities that treated 90.6 or more patients per day, while quality increased with increasing patient volume in health facilities that treated less than 90.6 patients per day in the outpatient departments [118]. Our finding is consistent with a study at public hospitals in China where overcrowding was negatively associated with clients' perception of quality of care [117]. The apparent correlation between patient volume and PQoC could be explained by increased pressure on HCPs, longer waiting times, and overuse of services. An increased patient volume would put a great deal of pressure on HCPs to treat a large number of patients in a short time. This may result in shorter consultation time and the omission of important practical aspects of care. On top of that, an increase in patient volume would mean longer waiting times at various service delivery points. An increase in patient volume could also lead to a scarcity of medicines and other medical supplies due to overuse of services in comparison to the capacity of health centers. All these factors could have contributed to a negative patient experience and influenced their perception of overall quality of care. Some studies reported a positive relationship between patient volume and quality of basic maternal care, and postoperative infections [174, 175]. The alternative direction of this relationship, in which quality drives patient volume, is based on the assumption that the provision of high-quality care will attract more patients. This may be true in areas where patients have access to competitive health care facilities, and HCPs are incentivized for providing higher quality care. This is not the case in low-income countries, like Ethiopia, where health care facilities are hard to reach for most rural populations. Members of CBHI

are further limited to using health services only in public health facilities affiliated with the scheme. Furthermore, despite an increase in patient volume is apparent after insurance coverage, there is no incentive system in place for health professionals.

This study found no significant association between staff job satisfaction and PQoC. This contrasts with the findings of Kvist et al [119], which reported a significant and positive relationship between job satisfaction among the nursing staff and patients' perceptions of quality of care. Despite this, it buffers the relationship between patient volume and PQoC. As job satisfaction increases, the effect of patient volume on PQoC becomes less and less negative.

The findings of this study will be an essential input for quality improvement initiatives as well as addressing challenges in the country's efforts to establish higher-level insurance pools. This is the first study of its kind to consider cluster-level variables associated with PQoC in Ethiopia. It gives an important lesson to healthcare managers and other relevant stakeholders to consider cluster-level characteristics in health care quality improvement efforts. It also pointed out quality dimensions that require special consideration in managerial decisions.

7.4. CBHI enrollment trends

This part of the dissertation examined the enrollment trends of the scheme over five years using key performance indicators, and explored the challenges impeding the membership development efforts. The sustainability of a voluntary CBHI scheme relies to a greater extent on the ability of implementers to attract and retain members [69]. The results revealed that the membership enrollment status at both districts has exhibited non-linear trends over the study period with both positive and negative growth ratios being noted. In Kallu district, both the coverage and renewal ratios increased sharply between 2017 and 2018, however, in Tehulederie, both ratios only slightly changed during the same period. This discrepancy between the two districts might be attributed to the timing of the scheme's initiation, which was two years late in Kallu. Membership growth for a voluntary program is a bit slower at first and increases as awareness improves over time. Increased growth is expected at the early stage of the scheme because of the lower membership base [68]. The coverage ratio in both districts seems to have stabilized at around 60% since 2018. One plausible explanation is that, as per the bylaw, members won't be permitted to access health care if district-level health insurance coverage falls below 60%. The district administrator who fails to meet the membership requirement will be responsible for the problems caused by the service interruption [57].

As a result, those in charge of membership enrollment may exert extra effort up until this requirement is met. Overall, the scheme in Tehulederie has a relatively higher population coverage and better membership retention. This could be due to the strong foundation laid by a rigorous public awareness campaign throughout the pilot period, as well as the technical assistance provided to the district's relevant stakeholders [48].

The low renewal ratios along with erratic membership growth in Kallu suggest that the scheme is experiencing internal movement, with some households leaving and others joining, potentially exposing it to adverse selection. This will result in a higher claims ratio, lower net income, and maybe bankruptcy if the problems are not fixed [68]. This is corroborated by findings of the financial performance status of the schemes, which showed that both schemes experienced a higher claims ratio during the period under study. The scheme in both districts spent more than it received for claims settlement in almost all the periods under the study, and hence experienced heavy losses in these periods.

To remain viable, a micro-insurance program must have a minimum growth ratio of zero [69]. However, both schemes have experienced negative growth ratios over the period under study. Furthermore, population coverage falls short of Ethiopia's health sector transformation plan, which aspires to 80% coverage by 2020 [170]. It has been noted that this level of insurance coverage was achieved by enforcing different intimidation techniques during the enrollment or renewal periods without the community's discretion, instead of employing membership attraction or retention strategies. The qualitative data highlighted a number of issues that could be contributing to the observed level of performance in terms of membership development. The first and most critical issue impeding membership growth is insurance members' dissatisfaction with the quality of care provided by contracted health facilities. Unavailability of medicines, perceived poor quality of medicines, perceived discrimination by HCPs, absence of good interpersonal interactions, and lack of trust in the competency and caring attitude of health care professionals were the main health care quality issues. The common complaints concerning hospital services include long waiting times, long appointments for non-emergency conditions, and the inability to access emergency care free of charge without a referral letter.

The finding on medicine availability was indeed substantiated by the results of the household survey, which revealed that among PQoC measuring items, medicine availability got the lowest perception

scores. These findings corroborate what has been documented in the literature, which has linked medicine unavailability to low enrollment and renewal rates in the scheme. In Ethiopia, the quality of health care, notably the availability of most essential medicines in public facilities, influences household decisions about whether or not to enroll or renew [74]. A study comparing the performance of two districts based on membership enrollment in Tanzania found that the high-performing district had better medicine availability [105]. Overall, scarcity of medicines is a common problem experienced by insured patients at contracted service provider facilities in different settings [35, 67, 79, 101-103]. The perceived low quality of medicines was also identified as a major barrier to insurance subscriptions. Elsewhere, a major factor for non-subscribers, that deters them from participating in the scheme was the low quality of medicines provided to insurance members [81, 107]. It was also revealed that the insured who were given generic medicines thought the care they received was of inferior quality [95].

Insured households were also dissatisfied with the way HCPs dealt with them. Many felt discriminated against because of their health insurance status, and they expressed their frustration with the disrespectful behavior and uncaring attitude of care providers. This was highlighted by the evaluation findings of the CBHI pilot phase in Ethiopia, when HCPs did not treat insured patients appropriately, believing that most insured people came to the health facility with minor medical issues due to the free service [35]. For the insured, HCPs were less likely to take their weight and temperature, use a stethoscope, physically examine them, and inform them of their diagnostic results in Burkina Faso [113]. In Rwanda and Ghana, insured patients reported a climate of disrespect and carelessness [112] as well as an unjust queuing system that favors the uninsured [99]. Other studies have also reported that insured patients have perceived and experienced discrimination and verbal abuse from HCPs [61, 79-81, 101].

It was found that the increased workload induced by insurance coverage deterred HCPs from interacting well with patients or allowing them sufficient time to examine and address their health concerns. It was also apparent that some service providers have shown signs of bitterness as a result of their overworked schedules. This may be partially attributable to the fact that, despite increased workload, there is no incentive system in place for health professionals. However, the claim that insured patients are handled differently than paying patients was mostly based on the insured's perceptions, which seems not really happening. In either scenario, whether there was perceived or actual discrimination, the scheme's ability to attract and retain members would be hampered. Overall,

the findings of this study indicated a lack of mutual trust in the relationship between scheme members and HCPs. Insured people associate everything that happens in health facilities with their insurance status, whereas HCPs might be biased in the notion that insured people visit health facilities for every minor ailment owing to free treatment.

The findings also revealed that some scheme members had little faith in the overall quality of health care provided by CBHI-affiliated health facilities. This was primarily because of their preferences, expectations, and level of awareness. As a result, people with financial means choose to go to private clinics and pay for their health care. If health care is of poor quality, membership will be less attractive, and expanding membership coverage will be challenging for the relevant stakeholders. This is backed by a household survey, which found that the perception that health care is of good quality is a key enabler of continued membership adherence. Households who rated the quality of health care as high adhere to the scheme longer compared to those who rated it as low. It has been documented elsewhere that the low perceived quality of health care was a major reason for low enrollment and renewal of subscriptions [78, 85].

Although the success of UHC initiatives relies on the quality of health care, governments have paid little attention to it, which Ridde and Hane (2021) labeled a “known but often ignored challenge” [176]. Quality of care will continue to be a major bottleneck to the scheme's sustainability unless the government devotes significant resources to health system strengthening, particularly human resource development and pharmaceutical supply, to meet the rising health care demand. It has been recognized that the scheme was launched without first strengthening the health system's capacity to handle the increasing patient flow and workload without compromising the quality of care. It is evident that health insurance is unlikely to result in the desired outcomes if there is no high-quality delivery system at the outset of the scheme [90].

Members of the scheme are entitled to reimbursement for any medical services they bought in private institutions due to unavailability in CBHI affiliate health facilities, as long as they follow the appropriate procedures. The scheme's performance in this regard can be assessed using the timeliness of reimbursement and the rejection ratio of submitted claims. The effectiveness with which claims are processed has a direct effect on subscriber satisfaction, which in turn has an impact on membership growth [68]. The findings revealed that claims settlement for OOP expenses was another source of dissatisfaction among insured persons. While OOP spending is a problem in and

of itself, clients are not properly reimbursed for their expenditures. Both the delay in reimbursement and the rejection of claims were major complaints. Scheme participants must wait a long time for their claims to be processed, with repeated appointments and long queues at the scheme office. For insured households who reside in remote areas, the cost of traveling to the scheme and the opportunity costs of following up on claims processing outweigh the benefits of receiving the claim. We were unable to get claims reimbursement records from the scheme office and hence could not determine the claims rejection ratio. However, the depth of the problem was highlighted by the qualitative data. Claims rejection was also common for several reasons, most of which stem from clients' low understanding of the kind of paperwork they should submit with their claims. The findings of the pilot project evaluation in Ethiopia also demonstrated that one of the problems the scheme faced was the rejection of claims, which was mostly due to members' failure to adhere to the required procedures [24]. In essence, claims rejection reflects how insured people well understand the scheme. When a claim is denied, it creates a negative perception of the insurance scheme that spreads beyond the claimant, undermining membership enrollment and renewal [68].

The findings reveal a lack of political will and commitment to the scheme's implementation. Rather than solving the many problems that arise during implementation and striving to serve the needs of the community, the primary concentration is on growing the number of enrollees. The efforts made by higher authorities are once-a-year campaigns that are only apparent at the time of membership enrollment. The scheme will fail to meet its mission as long as respective authorities at all levels of government do not closely monitor and support its implementation. This is corroborated by another study in Nigeria, where the non-involvement of local government officials in the implementation of a CBHI scheme negatively affected its effectiveness [177].

The scheme at the district level, where it is operationalized, is not an autonomous sector. Instead, it has been organized under the district health office, with a single sector acting as both a provider and a buyer of health care, raising accountability concerns. It is essential to take lessons from other countries that have implemented community health insurance more successfully. The National Health Insurance Scheme of Ghana, for instance, has independent offices in each district that are in charge of the overall management of a district mutual health insurance scheme. A district level scheme retain its independence by having its own governance and management structures [178].

There appear to be some "insurer moral hazard" practices in the scheme's governance, which could be explained by a lack of transparency, the issuance of directives that limit the insured's benefits, and infringement of governing rules. The insurers have not adequately communicated how the health insurance program works, which may be linked to the scheme's financial strain. Most of the time, scheme members remain in the dark about what they must do to receive their claims. This mirrored the evaluation finding of the pilot schemes in Ethiopia, which showed that members went to private pharmacies without knowing what was required for reimbursement, resulting in their claims being rejected and leaving them highly dissatisfied [24].

During the annual renewal period, subscribers are obliged to wait without receiving health services until coverage reaches 60% at the district level, despite having paid the premium [57]. This limits the full range of benefits that members should receive from the scheme. Member households would probably become ill during the coverage-free period, forcing them to incur additional health care costs. A new directive was also issued at the time of this study, stating that claims reimbursements for scheme members should be made at the price set by public health facilities. Concerns have been raised about the impact on future membership growth efforts, as well as the risk of jeopardizing scheme membership benefits. It will threaten both access to health care and the scheme's capacity to provide financial protection. Although the purpose of health insurance is to eliminate uncertainty, the amount of money that will be reimbursed will be unpredictable as a result of this directive. The poor will be hit harder, as it is likely that a large portion of the bill will go unpaid, or that they will forego treatment because they are unsure how much of their OOP expenses will be reimbursed. Instead of limiting claims benefits, it is essential to consider certain limits on the number of visits in a given period to discourage unnecessary visits to health facilities. Infringement of governing rules, which results in legitimate benefits being withheld from members is another governance concern that could hamper membership growth.

The fact that some households pay the premium without renewing their membership implies that the scheme is undervalued, and that scheme administrators are equating insurance coverage with revenue collection regardless of whether or not scheme members use health services and are protected from financial hardship. It also signifies that enrollment is compulsory. To be successful, key stakeholders involved in membership mobilization should focus on protecting the interests of the community. Building mutual trust with the community should be a priority, according to best practices learned from a high-performing village. Those who have direct contact with the community during

membership enrollment, such as *Kebele* leaders and HEWs, should demonstrate commitment to assisting scheme members in addressing their complaints. People's resistance to membership enrollment will be substantially reduced if they become community advocates.

It has been argued that for CBHI to be effective in terms of population coverage, voluntarism should be abandoned. Mandatory enrollment, on the other hand, can only work if governments commit to considerably expanding public funding of the health system and subsidizing members' contributions [179]. People may have a feeling of ownership if enrollment is voluntary, which may improve community members' participation in decision-making. Mandatory enrollment erodes the community's sense of ownership and causes people to develop a negative attitude toward health insurance as there is limited benefit due to the existing weak financial systems and poor quality of health care. Furthermore, if people are compelled to participate in the scheme, they may engage in abusive behaviors in retaliation.

Another concern that prevents people from joining or adhering to the scheme is the spread of misleading information in the community. Problems are widely publicized; some are overstated, while others are rumors or misinformation. This will severely compromise the sustainability of the scheme unless they are proven to be spurious claims. It contributes to the development of negative attitudes regarding health insurance in the community. The community does not value the scheme, and for some, it has been seen as a political tool that is not being used for the community's benefit. This necessitates the implementation of awareness-raising strategies that could help in the debunking of misinformation and rumors surfacing in the community.

7.5. Financial viability of CBHI

This study examined the scheme's financial viability using key performance indicators and explored its challenges from the perspectives of various stakeholders. The findings showed that both schemes experienced a higher claims ratio during the period under study. The scheme in both districts spent more than it received for claims settlement in almost all the periods under the study, as a result, they experienced heavy losses in these periods. Even after subsidies, the scheme's net income remained negative (for three and four fiscal years in Tehulederie and Kallu districts, respectively). The scheme did not experience losses in 2014 (Kallu) and 2018 in both districts. It has to be fleshed out more, especially in Kallu district. In Kallu, the scheme was launched in July 2013 and was not fully functional in terms of service delivery, except for creating awareness and enrolling households.

Furthermore, people may be unaware of how to utilize their insurance cards for health care and how to submit claims, which could explain the low claims cost in 2014. In this district, claims cost fell considerably in 2018, and sharply rise in 2019. Although there could be some other explanations, one likely reason could be a delay in claims reimbursement. Some service providers claim payments may not have been made in time in 2018, but were repaid in 2019. This is substantiated by the qualitative interviews, which showed that claim payments to service providers were frequently delayed because of budgetary constraints.

A high claims ratio indicates how valuable the program is to the insured, but if it is higher than predicted, the scheme may be about to fail, leading to a decline in financial protection. Moreover, persistently negative net income values may indicate that the program requires certain adjustments to become viable [68]. Rising claims cost is a common issue in voluntary health insurance schemes. Consistent with our findings, other studies reported claims ratios ranging from 4.3 to 18.1 in Ghana's national health insurance, which was too high than expected [63, 88].

As explored by the qualitative interviews, adverse selection, moral hazard behaviors, and unavailability of medicines at contracted health facilities are all possible reasons for higher claims costs. The findings revealed that households with higher health care needs are showing more interest in enrolling and staying in the scheme, implying adverse selection. The majority of people want to join health insurance only when they are facing a serious health issue, and quit the scheme when they no longer need care. Even those who dropped out of the scheme opt to re-enroll if they require health care with a high treatment cost. To prevent adverse selection, membership units were set at the household level instead of at the individual level. However, this was not adequately enforced in practice. As a result, partial enrollment, which entails ensuring family members requiring more health care is broadly practiced in the community. In line with our findings, studies in Ghana and China revealed that adverse selection was widespread, and it was seen as a major threat to the long-term viability of health insurance [72, 92, 93]. It was especially common among partially enrolled households in China [92]. Other studies in Uganda and Ghana found that healthy people choose to terminate their insurance policies since they were not benefited from the scheme, implying adverse selection [78-80, 86].

Risk cross-subsidization (cross-subsidy from the healthier to the less healthy) is the underlying principle of voluntary community health insurance schemes [22]. However, in the event of adverse

selection where the healthy are left out, the scheme's ability to risk cross-subsidization would be diminished because most members would consume health care that costs more than their contribution, leading to higher claims costs for the scheme. This study revealed that the scheme's financial loss was partially attributed to the fact that people with chronic illnesses are more represented in the scheme than healthy individuals. Hence, strategies must be devised to attract more members to improve the scheme's risk redistribution ability. Adverse selection pertaining to partial enrollment can be prevented by firmly enforcing the obligation to enroll all household members. For households that re-enroll in the scheme after dropping out, a waiting period during which benefits are not available can be imposed. This would make it more likely for healthy people to keep their membership or enroll in the scheme to avoid unforeseeable future risks.

The study also identified a variety of moral hazard behaviors that are indicative of scheme abuse, which includes repeated visits to a health facility for the same illness, storing medicines at home, seeking medical attention for every minor ailment, attempting to collect medicines for the uninsured, visiting different health centers for the same illness within the same period, and attending health care facilities ahead of time for follow-up appointments to reserve medicines. Our findings were corroborated by the evaluation findings of the pilot schemes in Ethiopia [24]. A study in Ghana also documented most of these moral hazard behaviors [31]. Although moral hazard has been argued to generate welfare and equity gains in health insurance [180], which may be true in some instances in this study, the majority of the behaviors observed are welfare losses. Most of the practices are undesirable to both individuals and the overall health insurance system. Unnecessary repeat visits, for example, lead to a shortage of medicines in health facilities, causing other members to make OOP spending at the point of service use. The scheme must also cover any excess claims costs incurred as a result of overconsumption, as well as high price markups at private pharmacies. To limit visits to different health centers for the same illness and period, Kallu district has implemented cluster-level treatment, in which patients are required to receive care only at one health center. Although this may fix the problem, it infringes on the rights of insurance cardholders to seek treatment at health centers where they believe the care is of better quality. When one health center runs out of medicines, for example, they would have to go to another health center. The findings revealed that two or more households are covered under health insurance as if they are one, and those with higher health care needs are only partially enrolled, an issue involving both adverse selection and moral hazard.

The study also revealed some moral hazard behaviors among HCPs, such as ordering expensive medicines and diagnostics, over-prescribing, and writing prescriptions for uninsured patients in the name of the insured. Behaviors including over-prescription of services, prescribing medicines with similar effects at the same time, prescribing the same medicine repeatedly, and unnecessary referral to private wings were also reported by findings of the pilot phase evaluation in Ethiopia [24]. Similarly, a study in Ghana documented several moral hazard behaviors on the part of service providers which include overprescribing, overcharging for drugs and services provided to clients, charging for services not provided, as well as inflating the number of clients served [31]. The scheme should consider replacing the existing fee-for-service provider payment mechanism with a capitation model, which is an efficient method of controlling over-servicing and operational costs, especially in primary care settings [181].

Unavailability of medicines at CBHI-affiliated health facilities is another issue that jeopardizes the scheme's financial viability. This is consistent with studies done elsewhere, which reported that a scarcity of medicines is a common source of concern among insured patients at contracted health facilities [35, 67, 79, 80, 101-103]. Due to the unavailability of medicines, insured patients were forced to buy them from private pharmacies at higher price markups. The scheme must reimburse OOP expenses made at private pharmacies for services that might have been delivered at contracted health facilities for a much lower cost. The governmental pharmaceutical supplier's restricted capacity to meet the demands of health facilities has additional indirect consequences on the scheme's claims costs. When health facilities are unable to receive medical supplies from the government pharmaceutical supplier and must instead procure from private distributors at higher price markups, they are forced to increase the service fee to their clients, hence increasing the scheme's medical bills. As a result, claims reimbursement for insurance members has become a substantial cost driver, thereby threatening the scheme's financial stability. Moreover, medicines are an essential component of high-quality care, and their scarcity in health care facilities would result in greater dissatisfaction among insured patients, limiting the size of risk pools.

It is worth noting that the scheme's high pocket money replacement indicated that it fell short of its purpose of protecting members from OOP expenses at the point of health service use. People who cannot afford to pay for medications at private institutions would also have limited access, as the only other option would be to forego treatment. This is supported by the fact that a shortage of medicines at contracted health facilities is largely due to the scheme's inability to settle claims in

time. Although an increase in the annual revenue of health centers has been documented during the pilot phase of CBHI in Ethiopia [171], this is not the case in the study districts. Health centers have experienced a financial setback after the introduction of the scheme. Although health care facilities mainly rely on claims payments to acquire supplies, many have been unable to meet their obligations due to considerable reimbursement delays. It has been revealed elsewhere that, due to claims payment delays, service providers have been forced to stop attending to insurance cardholders and issue prescriptions to buy medicines outside contracted hospitals [59, 60, 79-81]. A recent study in Ghana corroborated this finding, noting that delays in claim reimbursement have left health facilities with huge debts, making it difficult for them to operate [182]. This study revealed that a delay in claims settlement has been linked to medicine stockouts at contracted health facilities as both a cause and a consequence. In order to break the vicious circle that links scheme budget deficits, claims settlement delays, and medicine shortages, improving the capacity of government pharmaceutical supply should also be a priority.

The low insurance premiums in relation to the rising cost of health care has been highlighted as one important factor in the scheme's financial deficiency. This is consistent with the results of earlier studies [59, 60]. The fact that earned premiums are lower than claim costs in most of the financial reports partly suggests that revenues from beneficiary contributions are insufficient to cover the health care costs. This is common in low-income countries like Ethiopia, where the bulk of the CBHI target population are subsistence farmers who cannot afford even small premium rates [22]. While there will undoubtedly be concerns about the poor and most disadvantaged being left out, the health insurance premium should be managed to increase. Because government subsidies are determined as a percentage of earned insurance premiums, raising the premium level is also essential to increase government subsidies. To determine the base premium, however, more research on the community's willingness and ability to pay is required. This must, however, be done after efforts have been taken to improve the quality of health care, particularly in terms of medicine availability.

7.6. Validity and generalizability

7.6.1. Internal validity

To enhance the internal validity of the current study, we have tried to minimize the role of bias and confounding which could be alternative explanations for the observed association between the outcome and independent variables. The relationship between exposure and outcome may be

impacted by the role of bias. Thus, potential sources of biases, especially information bias were addressed.

To ensure that questions are clearly understood by the study participants, a cognitive interview was conducted as part of the pretesting. After the identification of items and careful wording of the question, cognitive interviewing of respondents was done to ensure that participants' interpretations of the items truly reflect the questions of the study. Standardized training was provided to the data collectors to familiarize them with the data collection tools and guide them on appropriate questioning techniques. Moreover, the use of standardized and validated data collection tools, and the recruitment of qualified data collectors and supervisors help minimize measurement bias. The use of an electronic data collection platform helps to improve the completeness of the data, as it allows built-in checks. It also helps to review the daily submissions and facilitate the supervision process. Attempts have also been made to minimize the role of recall bias by removing some covariates and limiting the recall period. The use of random sampling approach and the higher participation rates also could help to minimize selection bias and hence enhance the validity and generalizability of the study.

To ensure internal validity, we must account for confounding variables during the design or analysis stages, otherwise, the results may not reflect the actual relationship between the variables of interest. Confounding variables could distort the true association between the dependent and independent variables. In this study, we tried to incorporate as many variables as possible based on a literature review and a multivariable regression analysis involving multiple linear regression and AFT shared frailty models were performed to control the confounding effect of different variables. A multilevel linear regression model was also used to account for cluster-level variables linked to the PQoC. The use of a shared frailty model in identifying the factors associated with the time to drop out of CBHI also helps to account for unobservable cluster specific covariates. During analysis, preliminary assumptions and the goodness of fit of the model were also checked.

The qualitative part of the study employed different data collection methods and data sources (method and source triangulation) that could increase the credibility of the findings. The analysis and findings are thought to be credible because they were obtained through interviews with diverse key actors involved in the scheme's implementation, supplemented by a desk review. To foster reflexivity, the principal investigator kept a reflexive journal to record expectations, feelings,

observations, interview experiences, choices available, and decisions made throughout the research process. Hence, some methodological changes have been made based on lessons learned on self-reflection.

7.6.2. External validity

To improve the generalizability of the findings of the household surveys, the study included an adequate sample of participants who were chosen using a random sampling technique. A rich, thick description of the research setting, process, and findings was made to enhance the transferability of the findings of the qualitative interviews. The study provided a detailed account of the findings, backed up by adequate evidence in the form of quotes from participant interviews. As a result, the results of this dissertation can be reasonably generalized to households that have ever participated in a CBHI scheme all across the study districts and other areas of Ethiopia that have equivalent settings. Additionally, it could serve as a valuable lesson for CBHI initiatives in other districts with similar operating systems.

7.7. Strengths and limitations

This study employed a mixed methods study involving different methods of data collection from diverse data sources. This allows it to view the sustainability of CBHI from a wide range of perspectives and develop a more complete picture and understanding of the issue. The study employed advanced multivariable regression analysis models which helps in controlling the effect of various confounding variables. Moreover, this study attempted to consider cluster level factors that might have a bearing on members' adherence to their membership in the scheme and their perception of the quality of health care offered under the scheme.

Despite its methodological strengths, the study is not without limitations. The items set to measure value towards solidarity as part of the first study objective might be subjected to social desirability bias, for which most respondents might rate the items higher than their true feelings which could narrow the variation, despite efforts have been taken to minimize its effect through informing the study's purpose. Although we planned to include variables that might have a link with membership adherence based on desk reviews, such as yearly average health facility visits, benefit claims received and claims rejected, we omitted these variables owing to incomplete recording. This could limit the ability of the analysis to control the effect of additional confounders.

The study might be prone to recall bias in the measurement of the perceived quality of health care. Some respondents who had no recent visit to public health facilities, might not be as critical as those who had a recent visit experience. Another noteworthy limitation of this study is the use of relatively small cluster sample size to run the multilevel linear regression. In this study, only 12 health centers (level-two units) were included to assess the role of cluster level variables on the outcome variable. Concerns have been raised about the accuracy of estimates in multilevel modelling when there is small number of clusters. However, we employed the Restricted Maximum Likelihood estimation method, which could substantially improve the accuracy of estimates. The association between current insurance status and PQoC could be due to an endogeneity issue created by omitted variables. It is plausible that higher quality score reported by active members is due to such variables, as the desire to continue as a scheme member. Patient volume data based on secondary data may not reflect the true figure due to the possibility of under or over-reporting.

Another limitation is that, since the study used desk reviews as one main source of data, we were unable to investigate the enrollment trends over the whole scheme execution period due to insufficient data. Furthermore, due to incomplete records on the time to claims reimbursement after requests were made, we were unable to determine the promptness with which health service providers' claims were settled, which would have allowed us to contrast against the stipulated timeframe and the qualitative data. We were also unable to determine the claims rejection rate for the schemes due to a lack of records on rejected claims. The use of secondary data may not accurately reflect real enrollment trends and financial status. Finally, the study covered two CBHI schemes in two districts of northeastern Ethiopia. This limits the generalizability of the findings beyond the two case study settings.

In spite of these limitations, the findings of this study will be valuable in deploying improvements in the study districts, as well as other places. It will give essential information for policymakers to address challenges as they strive to revise scheme designs and establish higher-level pools.

8. CONCLUSIONS

Ethiopia's progress toward UHC through primary health care is largely dependent on the effective implementation of the CBHI scheme. The notion of sustainability is central to the scheme's successful implementation as part of the government's health finance system. A thorough examination of the performance of the scheme and its underlying challenges is paramount to gain a clear understanding of its sustainability. This thesis attempted to address the key knowledge gaps in this area.

The study identified a number of factors linked to people's adherence to CBHI membership. The presence of chronic illness in the family and household size were significantly and positively associated with the membership duration in CBHI, pointing out the existence of adverse selection. History of hospitalization under the scheme was positively associated with the time to drop out of CBHI, which implies that those who enjoyed the benefit of health insurance prefer to maintain their subscription. Current marital status of the study participants, perceived quality of care, perceived financial risk protection and trust in the scheme management were also significantly associated with membership adherence.

People's perceptions of quality of care varied depending on a variety of individual and cluster-level factors. The household's wealth status, current insurance membership, perceived health status, presence of chronic illness in the household, and recency of visit to a health center were individual-level factors associated with PQoC. At the cluster level, patient volume and work experience of HCPs were associated with PQoC. A lower patient volume allows the HCP to devote more time and attention to each patient, address the individual patient's needs, and have more time to improve communication with and provide behavior change counseling, which may enhance the quality of care. Staff job satisfaction was an important factor that buffers the association between patient volume and PQoC.

The provision of high-quality health care is an impetus behind the successful implementation and sustainability of the CBHI scheme. However, poor quality of care has been identified as a major impediment to the scheme's performance in terms of membership development, and financial status, and it will remain to be a major bottleneck to the scheme's sustainability unless the government takes the relevant measures.

The scheme experienced negative growth ratios in both study sites over five years period, showing that the program is not functionally viable. Issues related to the quality of care, and the delay or rejection of claims reimbursement for insurance holders were important threats to membership growth. The presence of certain "insurer moral hazard" tactics, which seek to reduce the scheme's financial burden, perpetuates this problem. All these will erode the community's trust in the scheme, which in turn will have an impact on membership development.

The scheme in both districts spent more than it received for medical bills in almost all the periods under the study, and experienced heavy losses in these periods, showing that it is not financially viable. The scheme was unable to protect members from OOP spending at the point of health service use and cannot be a reliable source of financing for health facilities. This implies that the scheme could not be able to generate adequate funds to satisfy the health care needs of its members. This can be attributed to a variety of issues. The main concerns that caused the scheme's claims costs to escalate were adverse selection notably partial enrollment, moral hazard behaviors, and unavailability of medicines in health facilities. Although health care facilities rely mainly on claims payments to acquire necessary supplies, they were unable to meet their obligations due to significant delays in reimbursements. The delay in claims settlement was exacerbated by the low insurance premium in relation to the costs of health care.

Overall, the sustainability of CBHI in the study districts is in jeopardy. The scheme will inevitably fail to attain its mission and cannot be a reliable strategy to advancing UHC unless relevant stakeholders at all levels of government demonstrate political will and commitment to its implementation, as well as advocate for the community.

9. RECOMMENDATIONS

9.1. Policy and operational recommendations

- It appears that the current design of the premium is attracting larger households to the scheme which creates a form of adverse selection. This indicates the need to reconsider the premium level in line with household size.
- To ensure that patients have access to a better quality of care, it is critical to determine an appropriate patient volume per care provider. This might require the recruitment of additional health care providers based on the patient volume in each health facility.
- It is vital to devise mechanisms to enhance staff job satisfaction, especially in health facilities with higher patient volume, as it buffers the association between patient volume and the perception of quality of care.
- If the government does not make considerable efforts in strengthening the health system, notably in human resource development and expanding the capacity of the government pharmaceutical supply, poor quality of health care will continue to be a major bottleneck to the scheme's sustainability. More importantly, health centers should go to great lengths to ensure that every patient has access to the necessary medications and services.
- Compulsory enrollment is unlikely to be a long-term solution for membership development unless the government focuses on quality improvement initiatives. Instead, scheme administrators and other stakeholders should foster a trusting climate among community members and develop less costly member attraction strategies. Those who have direct contact with the community during membership mobilization, such as *Kebele* leaders and HEWs, should demonstrate commitment to protecting the interests of scheme members and addressing their complaints.
- A well-planned and organized awareness-raising strategies need to be implemented by the scheme to boost the communities understanding on the basic principles of health insurance, the rights and duties of the scheme members, a clear boundary of the benefit packages and how to leverage the benefits of the scheme, and to help debunk misconceptions and rumors that are prevalent in the community.

- Claims reimbursement for scheme members is made based on the price set by public health facilities, which raises concerns about the risk of jeopardizing scheme membership benefits. Instead of limiting claims benefits, it is essential to consider certain limits on the number of visits in a given period to discourage unnecessary visits to health facilities.
- *Kebele* leaders need to firmly enforce the obligation to enroll all household members in the scheme to prevent adverse selection related to partial enrollment.
- For households that re-enroll in the scheme after dropping out, a waiting period during which benefits are not available can be imposed. This would make it more likely for healthy people to keep their membership or enroll in the scheme to avoid unforeseeable future risks.
- The scheme should consider limits on the number of visits in a given period to avert rising medical bills due to patient moral hazards.
- Raising awareness of the concept of solidarity is vital to persuading insured people to change their anti-scheme behaviors, as some moral hazard practices are linked to a lack of community understanding of health insurance principles.
- To prevent the enrollment of two or more households as a single scheme member, the scheme and *Kebele* administrators should strive to revise the family structure that has existed since the introduction of health insurance.
- To overcome some of the service provider moral hazard behaviors, the scheme should consider replacing the existing fee-for-service provider payment mechanism with a capitation model, which is an efficient method of controlling over-servicing and operational costs, especially in primary care settings.
- The scheme's administrators should consider increasing the premium by at least the amount required to pay for the medical bills of the insured community. This must, however, be done after efforts have been taken to improve the quality of health care, particularly in terms of medicine availability. Because government subsidies are determined as a percentage of earned insurance premiums, raising the premium level is also essential to increase government subsidies. In line with this, additional fee waivers could also be implemented to subsidize those who might otherwise be excluded because they cannot afford the increased premium.

9.2. Recommendations for future research

- Related to the quality of health care survey, it is recommended that similar studies are performed by considering the experience of insured patients at a hospital level. It would also be worthwhile to explore, using a qualitative approach, the health care providers' experience of managing insured patients in a hospital setting.
- The current study primarily aimed to explore the challenges impeding the performance of CBHI. It is recommended to do studies on the prospects of the scheme as it will give a lesson for future improvements in other areas. This could include a qualitative study of the experience of insured households that had benefited from the scheme in terms of access to advanced medical care and risk protection from financial loss.
- It is recommended to carry out a community-based study on people's opinions regarding the discontinuation of CBHI and associated factors to understand the community's attitude toward the scheme.
- This study uncovers some of the issues related to the scheme's institutional viability, like the governance practices. However, a more detail study is recommended on this area including distribution of tasks, management of human resources, financial and information management within the scheme. In this regard we also recommend to include higher officials as study participants.
- This study covered two CBHI schemes in two districts of northeastern Ethiopia. This limits the generalizability of the findings beyond the two case study settings. As a result, more research is recommended to examine the sustainability of the CBHI scheme in a broader geographical area. In this regard, we recommend to include higher officials as study participants. It is advisable to employ additional indicators, especially financial performance metrics to gather sufficient data and determine whether or not the scheme will be financially viable over time.
- This study is conducted just prior to a conflict that caused damage to the health systems in many parts of northern Ethiopia, including the study area. Medical supplies, infrastructure, and various health and medical records have all been lost or damaged. The conflict may have substantial direct and indirect effects on the proper functioning of the health system as a whole, and impact service quality in particular. An assessment of the situation may be required to determine how much the conflict is affecting the CBHI and how resilient the health system and insurance agency are of restoring the scheme's functionality.

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Annexes

Annex 1: Mean score of each measurement item of the PQoC (on a 20-100 scale)

Factors and items	95% CI			
	Mean	SD	LCI	UCI
Technical care	68.34	15.24	67.43	69.25
The necessary laboratory tests were performed	69.20	18.36	68.10	70.29
Health care providers perform the necessary physical examinations	68.23	18.89	67.11	69.36
Health care providers make good diagnoses	67.59	17.69	66.53	68.64
Patient-provider communication	77.84	10.12	77.23	78.44
Health care providers actively ask questions to understand your situation	80.39	11.68	79.69	81.09
Health care providers listened to you carefully what you had to say	79.61	10.93	78.96	80.26
Health care providers treated you with courtesy and respect	73.51	16.72	72.51	74.50
Information provision	64.67	13.87	63.84	65.49
Health care providers clearly explained the use and side effects of medicines	62.90	19.87	61.72	64.09
Health care providers clearly explained the results of tests and examination	62.50	19.48	61.34	63.66
Health care providers explain things in a way you could understand	69.36	17.42	68.32	70.40
Health care providers spent sufficient time examining patients	63.90	20.18	62.70	65.11
Access to care	69.47	11.77	68.77	70.17
Patients do not wait long in the health center to receive treatment	62.96	20.17	61.76	64.16
All prescribed medicines are available on the spot	63.50	20.37	62.28	64.71
Health center assistants are friendly and helpful to patients	73.38	16.07	72.42	74.34
The health center serves all patients fairly	78.06	15.90	77.11	79.01
Trust in care providers	73.20	11.02	72.55	73.86
Treatment is effective for recovery and cure	72.47	14.78	71.59	73.35
Health care providers prescribe appropriate medicines for patients	75.47	12.90	74.70	76.24
You have confidence in the competence of health care providers	71.67	14.36	70.82	72.53
Overall perceived quality of care (PQoC)	70.28	8.39	69.77	70.78

Annex 2: Household survey questionnaire

SECTION I: Household and Respondent's Background Characteristics

A. Demographic and socio-economic characteristics of respondents			
S.N	Questions and filter	Response categories and coding	Skip
101.	What is your age?	_____ Years	
102.	What is your sex?	Male 1 Female 2	
103.	What is your current marital status?	Single 1 Married 2 Divorced 3 Widowed 4	
104.	Have you ever attended school?	Yes 1 No 2	►106
105.	What is the highest level of education you have completed?	Grade _____	
106.	What is your current occupation?	Farmer 1 Merchant 2 Daily worker..... 3 Petty trading 4 Other (Specify)..... 5	
107.	Are you a <i>Kebele</i> administrator?	Yes 1 No 2	
108.	District	Tehulederie 1 Kallu 2	
109.	What is the name of the <i>Kebele</i> you are living in?	Name of <i>Kebele</i> _____	
110.	When the members of the household get sick, in which health facility do they usually go to obtain medical service?	Name of health center _____	
111.	When was the last time that any member of the household had a consultation with a health professional? In the last	30 days 1 1 to 3 months 2 3 to 6 months 3 6 to 12 months 4 More than 12 months 5	
112.	How many times has any household member visited a health facility in the past 12 months?	_____ visits	
113.	How would you rate the overall health of the household?	Poor 1 Fair..... 2 Good 3 Very good 4 Excellent 5	
114.	Your CBHI card number	_____	
115.	Year of enrolment to CBHI (see CBHI ID)	_____ E.C	

116.	What is your household's current CBHI insurance status	Active member..... 1 Ex-member 2	
117.	Have you ever dropped out of CBHI after enrollment?	Yes..... 1 No 2	►119
118.	At what year did you drop out of CBHI? (see CBHI ID)	_____ E.C	
119.	For how many years have you been a member without dropping out since you first enrolled for health insurance?	_____ years	
120.	How many persons live in this household	_____ Persons	
121.	Are you a beneficiary of the productive safety net program	Yes 1 No 2	

B. Household Characteristics			
No.	Questions and filter	Response categories and coding	skip
122.	What is the main source of drinking water for members of your household?	Piped Water 1 Dug Well Protected well 2 Unprotected well 3 Water from Spring Protected spring..... 4 Unprotected spring..... 5 Surface water ¹ 6	
123.	What kind of toilet facility do members of your household usually use?	Ventilated improved pit latrine 1 Pit latrine with slab..... 2 Pit latrine without slab/open pit..... 3 No facility/bush/field 4	
124.	What type of fuel does your household mainly use for cooking? <i>[Multiple options possible]</i>	Electricity 1 Kerosene 2 Charcoal 3 Wood 4 Shrubs/agricultural crop..... 5 Animal dung 6 Others (Specify) _____ 7	
125.	What type of fuel does your household mainly use as a source of light? <i>[Multiple options possible]</i>	Electricity 1 Lamp 2 Kerosene lamp 3 Solar light 4 Wood 5 Others (Specify) _____ 6	

¹ River/lake/dam/pond/ stream/canal/ irrigation channel etc.

126.	How many rooms are used for sleeping?	_____ Rooms		
127.	How many of the following animals does this household own? (If none, record '00')	a. Milk cows, oxen or bulls.....		
		b. Other cattle.....		
		c. Horses/donkeys/mules		
		d. Camels		
		e. Goats/Sheep.....		
		f. Chickens or other poultry....		
		g. Beehives		
128.	Does any member of this household own any agricultural land?	Yes.....	1	→130
		No	2	
129.	How many hectares of agricultural land do members of this household own?	Sq. meter _____ OR “Timad” _____		
130.	Does your household have:		Yes No	
		a. Electricity	1 2	
		b. Radio	1 2	
		c. Television	1 2	
		d. Chair/Sofa.....	1 2	
		e. Refrigerator	1 2	
		f. Solar light	1 2	
		g. Bed with cotton/mattress.	1 2	
		h. Lamp	1 2	
131.	Does any member of this household own?		Yes No	
		a. Watch	1 2	
		b. Mobile telephone	1 2	
		c. Animal-drawn cart	1 2	
132.	Does any member of this household have a bank account?	Yes	1	
		No	2	
133.	Main material of the FLOOR of the dwelling (observation)	a. Earth/sand/dung.....	1	
		b. Cement /ceramic/carpet.....	2	
134.	Main material of the ROOF of the dwelling (observation)	a. Thatch/cartoon/plastic	1	
		b. Corrugated iron /cement	2	
135.	Main material of the exterior WALL of the dwelling (observation)	a. Wood with mud/stone with mud	1	
		b. Plastic/sticks/carpet.....	2	
		c. Cement/stone with cement/ /cement blocks	3	

SECTION II: Perception of the scheme and its services

A. Scheme service and benefit			
201.	Is/was there a member of the family with clinically diagnosed chronic illness?	Yes	1
		No	2
202.	Was there a member of the family who was admitted to a hospital under a scheme member?	Yes.....	1
		No	2
203.	Was there a situation where any member of the household has forgone to use any health service after visiting a health facility? ²	Yes.....	1
		No	2 → 205
204.	What was the reason for not obtaining/using the service?	Service unavailability	1
		Inability to pay	2
		Unable to wait a long time.....	3
		Other	4
205.	Have you been required to pay at the time-of-service use?	Yes	1
		No	2 → 208
206.	Was there a situation in that your claims have been rejected?	Yes	1
		No	2 → 208
207.	For how many times were your claims rejected?	_____ times	

B. Value towards solidarity		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
208.	Subscribers should pay the same contribution whatever their income	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
209.	Subscribers with chronic diseases should pay more than the healthy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
210.	Subscribers should pay different premium levels based on the health services used	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
C. Perceived financial risk protection						
211.	The scheme protects its members from selling important assets at the time of using health care	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
212.	The scheme protects its members from borrowing at the time of using health care	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
213.	The scheme protects its members from the out-of-pocket payment at the time of health care	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
D. Trust in scheme management						
214.	The scheme staff care about your health just as much or more than you do	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

² Health service – medical procedure, diagnostics or medicines

215.	The scheme staff are completely honest and reliable	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
216.	You believe the scheme will pay for everything it is supposed to, even really expensive treatments	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
217.	The scheme cares more about making money than about getting you the treatment you need	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
218.	You believe the scheme does good for the community	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
E. Perceived quality of care						
219.	Patients wait long in the health facility to obtain needed services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
220.	The health center serves all patients fairly	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
221.	Health care providers treated you with courtesy and respect	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
222.	Health care providers spent sufficient time examining and discussing your health problem	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
223.	Health care providers listened to you carefully what you had to say	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
224.	Health professionals perform the necessary physical examinations	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
225.	The necessary Lab. and other tests are done	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
226.	All prescribed drugs are available on the spot	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
227.	You have confidence and trust in the health care providers examining and treating patients	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
228.	Health care providers treat you with care and understand your concerns	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

SECTION III: Perceived health care quality

The following questions are concerning the health facility which is the usual source of health care for your family members. Respond to the questions based on what you have observed or experienced in the health service while you seek care or accompany your family members.

No.	Health care quality measurement items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
301.	The health facility environment is clean (i.e., OPD rooms, toilets, waiting room, etc.)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
302.	The waiting room has enough space and seating	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
303.	Patients wait long in the health facility to obtain needed services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
304.	The health center serves all patients fairly	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

305.	Health care providers treated you with courtesy and respect	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
306.	Health care providers spent sufficient time examining and discussing your health problem	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
307.	Health care providers actively ask questions to better understand your situation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
308.	Health care providers listened to you carefully what you had to say	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
309.	Health professionals perform the necessary physical examinations	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
310.	The necessary Lab. and other tests are done	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
311.	Health care providers make good diagnoses	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
312.	Health professionals prescribe the appropriate medication for the patient	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
313.	All prescribed drugs are available on the spot	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
314.	Treatment is effective for recovery and cure	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
315.	You have confidence and trust in the health care providers examining and treating patients	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
316.	Health care providers treat you with care and understand your concerns	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
317.	Health care providers explain things in a way you could understand	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
318.	Health care providers clearly explained to you the results of the tests and examination	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
319.	Health care providers explained the use and side effects of medications you were to take at home in a way you could understand	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
320.	Health center assistants are friendly and helpful to patients	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
321.	Overall, how would you rate the health services you received?	1 Poor	2 Fair	3 Good	4 Very Good	5 Excellent

SECTION IV: Questionnaire for health care providers

No.	Questions	Response categories and coding
401.	How long have you worked in this health facility	_____ Years
402.	How long is your work experience in general as a health service provider	_____ Years
403.	What is your current profession?	Public Health officer 1 BSC Nurse 2 Other (specify) _____ 3

A. Job satisfaction		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
404.	The management of this organization is supportive of me	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
405.	I feel encouraged by my supervisor to offer suggestions and improvements	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
406.	I receive the right amount of support and guidance from my direct supervisor	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
407.	I am appropriately recognized when I perform well at my regular work duties	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
408.	My work is evaluated based on a fair system of performance standards	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
409.	I have adequate training opportunities necessary for me to perform my job	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
410.	My coworkers and I work well together	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
411.	I feel that my workload is manageable	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
412.	I am provided with all the equipment, supplies, and resources necessary to perform my duties	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
413.	I am satisfied with my benefits and payments	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
414.	I feel I can easily communicate with members from all levels of this health facility	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
415.	This health facility is a good place to work	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
B. Affective commitment						
416.	I feel a strong sense of belonging to my facility	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
417.	I feel emotionally attached to this facility	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
418.	I feel like part of the family at my facility	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
419.	This facility has a great deal of personal meaning for me	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
420.	I really feel as if this facility's problems are my own	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
421.	I feel my job in this facility is like my own specific job	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
422.	I think that it is proud to be an employee of this facility	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Household survey questionnaire (የአማርኛ ቃለመጠይቅ)

ክፍል 1: የቤተሰብና የአባወራ/አማወራ ዳራ መገለጫ

ሁ. ማህበራዊ እና ስነህዝባዊ ኔታ			
ተ.ቁ	መጠይቅ	መልስና ኮድ	ዝላል
101.	እድሜ (በዓመት)	_____	
102.	ፆታ	ወንድ..... 1 ሴት 2	
103.	የጋብቻ ሁኔታ	ያላገባ/ች 1 ያገባ/ች 2 የፈታ/ች 3 የሞተበት/ባት..... 4	
104.	ዘመናዊ ትምህርት ቤት ገብተው ተምረዋል?	አዎ 1 አይ 2	▶106
105.	የትምህርት ደረጃ	ክፍል/ደረጃ _____	
106.	የሥራ አይነት	ገበሬ 1 ነጋዴ 2 የቀን ሰራተኛ 3 ጥቃቅንና አነስተኛ ሥራ 4 ሌላ (ይጠቀስ)..... 5	
107.	በቀበሌ አስተዳደር ውስጥ በኃላፊነት ይሰራሉ?	አዎ 1 አይ 2	
108.	ወረዳ	ተሁለደሬ 1 ቃሉ 2	
109.	ቀበሌ	የቀበሌው ስም _____	
110.	የርስዎ ቤተሰብ በአብዛኛው ህክምና የሚያገኘው ከየትኛው ጤና ጣቢያ ነው?	የጤና ጣቢያው ስም _____	
111.	እርስዎ ወይም የቤተሰብዎ አባላት በቅርብ ጊዜ ወደ ጤና ተቋም ለህክምና ከሄዱ ምን ያህል ጊዜ ሆነ?	30 ቀናት 1 ከ1 እስከ 3 ወር 2 ከ3 እስከ 6 ወር 3 ከ6 እስከ 12 ወር 4 ከ12 ወር በላይ 5	
112.	ባለፉት 12 ወራት የቤተሰብዎ አባላት ምን ያክል ጊዜ ወደ ጤና ተቋም ለህክምና ሄደዋል?	በ12 ወር ውስጥ _____	
113.	የቤተሰብዎን የጤንነት ሁኔታ እንዴት ይገልጹታል?	ዝቅተኛ..... 1 መጠነኛ..... 2 ጥሩ 3 በጣም ጥሩ 4 እጅግ በጣም ጥሩ 5	
114.	የማህበረሰብ አቀፍ ጤና መድሀኒ ካርድ ቁጥር	_____	
115.	ለማእጫ አባልነት የተመዘገቡበት ዓመት (ደብተሩን ይመልከቱ)	_____ ዓ.ም	
116.	በአሁኑ ሰዓት የማህበረሰብ አቀፍ ጤና መድሀኒ አባል ነዎት?	አባል ነኝ..... 1 አቋርጫለሁ 2	
117.	የማ/ አቀፍ ጤና መድሀኒ አባልነትዎን አቋርጠው ያውቃሉ?	አዎ 1 አይ 2	▶119

118.	የማእጫ መ አባልነት ያቋረጡበት ዓመት (ደብተሩን ይመልከቱ)	_____ ዓ.ም	
119.	ለጤና መድሀን ከተመዘገቡ ጀምሮ ሳያቋርጡ ለስንት አመት ቆዩ?	_____ ዓመት	
120.	በቤት ውስጥ በቋሚነት የሚኖሩ የቤተሰብ አባላት ብዛት	_____ ሰዎች	
121.	የሴፍቲኬት ፕሮግራም ተጠቃሚ ነዎት?	አዎ..... 1 አይ 2	

ለ. የመኖሪያ ቤትና የሀብት ሁኔታ

ተ.ቁ	መጠይቅ	መልስና ኮድ	ዝለል
122.	ቤተሰቡ የመጠጥ ውሃ በአብዛኛው የሚያገኘው ከየት ነው?	<ul style="list-style-type: none"> ቧንቧ ውሃ..... 1 ጉድጓድ ውሃ የተጠበቀ..... 2 ያልተጠበቀ 3 የምንጭ ውሃ የተጠበቀ..... 4 ያልተጠበቀ 5 የወንዝ/የጅረት/የሀይቅ/የኩሬ/የግድብ..... 6 	
123.	የቤተሰቡ አባላት በአብዛኛው ለመጻፍት የሚጠቀሙት ቦታ የት ነው? (በምልክታ አረጋግጥ)	<ul style="list-style-type: none"> 1) የተሻሻለ መጻፍ ቤት..... 1 2) ክዳን ያለው የተለምዶ መጻፍ ቤት..... 2 3) የተለምዶ መጻፍ ቤት ያለክዳን..... 3 4) ሜዳ/ጫካ ውስጥ 4 	
124.	በቤት ውስጥ በአብዛኛው ለምግብ ማብሰያነት የምትጠቀሙት የሃይል ምንጭ ምንድን ነው?	<ul style="list-style-type: none"> 1) ኤሌክትሪክ 1 2) የተፈጥሮ ጋዝ 2 3) ከሰል 3 4) የማገዶ እንጨት 4 5) ችፍርግ/ቁጥቋጦ/አገዳ 5 6) ኩብት..... 6 7) ሌላ _____ 7 	
125.	በቤት ውስጥ በአብዛኛው ለብርሃን ምንጭነት የምትጠቀሙት የሃይል ምንጭ ምንድን ነው?	<ul style="list-style-type: none"> 1) ኤሌክትሪክ..... 1 2) ፋናስ 2 3) ኩራዝ..... 3 4) ሶላር 4 5) የማገዶ እንጨት 5 6) ሌላ _____ 6 	
126.	በቤተሰብ ደረጃ ለመኝታነት የምትገለገሉባቸው ስንት ክፍሎች አሉ?	_____ ክፍሎች	
127.	በቤት ውስጥ የሚገኙ የቤት እንግት አይነቶችንና ብዛታቸውን በተመለከተ ጠይቀው ይሙሉ:: ምንም ከሌለ '00' ይሙሉ	<ul style="list-style-type: none"> 1) የወተት ላም/በሬ..... 2) ሌላ የቀንድ ከብት..... 3) ፈረስ/በቅሎ/አህያ 4) ግመል..... 5) ፍየል/በግ..... 6) ዶሮ..... 7) የንብ ቀፎ 	
128.	በቤተሰብ ደረጃ የእርሻ ማሳ አለ?	አዎ..... 1 አይ..... 2	→ 130
129.	የእርሻ ማሳ ካለ ስፋቱ ምን ያህል ይሆናል?	_____ ሄክታር _____ ጥማድ	

130.	እባክዎ የሚከተሉት ቁሳቁሶች በቤተሰብ ደረጃ መኖራቸውን መልስ ይስጡ።	<p style="text-align: right;">አለ የለም</p> 1) ኤሌክትሪክ መብራት..... 1 0 2) ሬድዮ..... 1 0 3) ቴሌቪዥን..... 1 0 4) ወንበር ወይም ሶፋ..... 1 0 5) ፍሪጅ..... 1 0 6) ሶላር 1 0 7) አልጋና የጥጥ/ስፖንጅ ፍራሽ... 1 0 8) ፋኖስ 1 0
131.	ከቤተሰቡ አባላት መካከል የሚከተሉት ቁሳቁሶች ያለው አለ ወይ?	<p style="text-align: right;">አለ የለም</p> 1) ሰዓት..... 1 0 2) ሞባይል ስልክ..... 1 0 3) ጋሪ 1 0
132.	ከቤተሰቡ አባላት መካከል የባንክ ደብተር/አካውንት ያለው አለ?	አዎ 1 አይ..... 2
133.	የመኖሪያ ቤቱ ወለል በዋናነት የተሰራበት ቁስ (በምልክት አረጋግጥ)	1) ጭቃ/አሸዋ/ፍግ 1 2) ስሚንቶ/ሴራሚክ/ስጋጂ..... 2
134.	የመኖሪያ ቤቱ ጣራ በዋናነት የተሰራበት ቁስ (በምልክት አረጋግጥ)	1) ሳር/ካርቶን/ኬንዳ 1 2) ቆርቆር/ሲሚንቶ..... 2
135.	የመኖሪያ ቤቱ ግድግዳ በዋናነት የተሰራበት ቁስ (በምልክት አረጋግጥ)	1) እንጨት በጭቃ/ድንጋይ በጭቃ 1 2) ኬንዳ/ሴራን/ጭራሮ 2 3) ስሚንቶ/ድንጋይ በስሚንቶ/ብሎኬት 3

ክፍል 2: የማህበረሰብ አቀፍ ጤና መድሀን እና ስለሚሰጠው ግልጋሎት በተመለከተ

ሀ. ግልጋሎት ማግኘትና ተጠቃሚነት		
201.	ከቤተሰቡ አባላት መካከል በጤና ባለሙያ በተረጋገጠና ለረጅም ጊዜ በቆየ የጤና ችግር የታመመ ነበር/አለ?	አዎ 1 አይ 2
202.	የጤና መድሀን አባል ሆናችሁ ከቤተሰቡ አባላት መካከል በሆስፒታል ተኝቶ የታከመ ነበር?	አዎ 1 አይ 2
203.	ከቤተሰቡ አባላት መካከል ለህክምና ወደ ጤና ተቋም ሄዶ አገልግሎት ሳያገኝ የተመለሰ ነበር? ³	አዎ 1 አይ 2 → 205
204.	አገልግሎት ሳያገኝ የተመለሰበት ምክንያት ምን ነበር?	አገልግሎቱ ባለመኖሩ 1 መክፈል ባለመቻል 2 ረጅም ሰዓት መጠበቅ ባለመቻል..... 3 ሌላ..... 4
205.	የጤና መድሀን አባል ሆናችሁ ለህክምና ወይም ለመድሃኒት ከኪሳችሁ ብር ከፍላችሁ ታውቃላችሁ?	አዎ 1 አይ 2 → 208
206.	ለህክምና ከኪስዎ ላወጡት ወጭ የትክ ክፍያ ጠይቀው ሳይከፈልዎ ቀርቶ ያውቃል?	አዎ 1 አይ..... 2 → 208
207.	ለስንት ጊዜ ያህል የትክ ክፍያ ተከለከሉ? ጊዜ

³ አገልግሎት— መድሀኒት፣ ላብራቶሪ፣ ሌላ ምርመራ

ሉ. እርስበርስ ስለመደጋገፍ		በጥብቅ አልተማመነም	አልተማመነም	ገለልተኛ	እስተማመነለሁ	በጥብቅ እስተማመነለሁ
208.	ለጤና መድሀን አባልነት ሀብታምም ሆነ ድሃ እኩል መዋጮ ቢከፍሉ የተሻለ ነበር ይላሉ?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
209.	ሥር የሰደደ በሽታ ያለባቸው አባላት በብዛት ስለሚታከሙ ከጤናኞቹ የበለጠ መዋጮ መክፈል አለባቸው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
210.	የጤና መድሀን አመታዊ መዋጮ አባላት በሚያገኙት ህክምና መጠን መሰረት መሆን አለበት	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
ሐ. የወጭ ጫና ስጋትንና ድህነትን መከላከል						
211.	የጤና መድሀን፣ አባላቱ ውድ ሀብታቸውን ለመታከሚያ እንዳይሸጡ ጠብቋቸዋል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
212.	የጤና መድሀን፣ አባላቱ ለህክምና የሚሆን ገንዘብ እንዳይበደሩ ጠብቋቸዋል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
213.	የጤና መድሀን፣ አባላቱ በህክምና ወቅት ከኪሳቸው ገንዘብ ሳይወጡ በነፃ እንዲትከሙ አስችሏቸዋል	1 <input type="checkbox"/>	2 <input type="checkbox"/>		4 <input type="checkbox"/>	5 <input type="checkbox"/>
መ. በጤና መድሀን ተቋሙ ላይ ያለዎት እምነት						
214.	የጤና መድሀን ሰራተኞች ለርስዎና ለቤተሰብዎ ጤንነት እንደርስዎ ወይም ከርስዎ በላይ ያስባሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
215.	የጤና መድሀን ተቋሙ ሰራተኞች ሀቀኛና ታማኝ ናቸው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
216.	የጤና መድሀኑ ቃል በገባው መሰረት ውድ ህክምና ቢሆንም እንኳ ማንኛውንም የህክምና ወጭ ይሸፍንልኛል ብለው ያምናሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
217.	የጤና መድሀን ሰራተኞች አባላቱ የተሻለ ህክምና እንዲያገኙ ከማድረግ ይልቅ ገንዘብ ማካበት ላይ ትኩረት ያደርጋሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
218.	የጤና መድሀን ለማህበረሰቡ ጥቅም እያስገኘ ነው ብለው ያምናሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
ሠ. የጤና አገልግሎት ጥራትን						
219.	ታካሚዎች ህክምና ለማግኘት በጤና ጣቢያ ውስጥ ረጅም ሰዓት ይጠብቃሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
220.	ጤና ጣቢያው ያለምንም ማዳላት ሁሉንም ታካሚዎች በፍትሃዊነት ያስተናግዳል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
221.	የጤና ባለሙያዎች ታካሚዎችን በአክብሮት እና በትህትና ያስተናግዳሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
222.	የጤና ባለሙያዎች በቂ ጊዜ ሰጥተው ከታካሚዎች ጋር ይወያያሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
223.	የጤና ባለሙያዎች ታካሚዎችን በፅኑና ያዳምጣሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
224.	የጤና ባለሙያዎች አስፈላጊውን የአካል ምርመራ ያደርጋሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

225.	በጤና ጣቢያው ውስጥ አስፈላጊ የላቦራቶሪ ምርመራዎች ይደረጋሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
226.	በባለሙያ የሚታዘዙ መድሃኒቶች ሁሉም ጤና ጣቢያ ውስጥ ይገኛሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
227.	ህክምና የሚሰጡ ባለሙያዎች አስተማማኝ ዕውቀትና ብቃት አላቸው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
228.	የጤና ባለሙያዎች ለታካሚዎቻቸው ሩህሩህና ተንክባካቢ ናቸው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

ክፍል 3: የጤና አገልግሎት ጥራትን በተመለከተ

የሚከተሉት ጥያቄዎች እርስዎና የቤተሰብዎ አባላት በአብዛኛው የህክምና አገልግሎት የምታገኙበት የጤና ተቋምን በተመለከተ ይሆናል። እርስዎ ሲታከሙ ወይም የቤተሰብዎ አባላትን ሲያሳክሙ ያዩትን ያጋጠመዎትንና የተደረገልዎትን መሰረት አድርገው ለጥያቄዎቹ መልስ ይስጡ።

ተ. ቁ	መጠይቅ	በጥብቅ አልሰማማም	አልሰማማም	ገለልተኛ	እስማማለሁ	በጥብቅ እስማማለሁ
301.	የጤና ተቋሙ ግቢ ዕዳና ማራኪ ነው (የህክምና ክፍሎች፣ መጠቀሚያ ቤት፣ የታካሚ ማረፊያ ክፍል)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
302.	የታካሚዎች ማረፊያ ክፍል በቂ ቦታና መቀመጫ አለው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
303.	እርስዎ ወይም ቤተሰብዎ የህክምና አገልግሎት ለማግኘት በጤና ተቋም ውስጥ ረጅም ሰዓታትን ይጠብቃሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
304.	የጤና ተቋሙ ሁሉንም ታካሚዎች ያለምንም መድሎ በፍትሃዊነት ያስተናግዳል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
305.	የጤና ባለሙያዎች ታካሚዎችን በአክብሮት እና በትኩረት ያስተናግዳሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
306.	የጤና ባለሙያዎች የጤና ምርመራ ለማድረግና በጤና ችግርዎ ዙሪያ ለመወያየት በቂ ጊዜ ይሰጣሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
307.	የጤና ባለሙያዎች የርስዎን የጤና ሁኔታ በሚገባ ለመረዳት ጥያቄዎችን በንቃት ይጠይቃሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
308.	የጤና ባለሙያዎች ታካሚዎች የሚነግሯቸውን ሁሉ በፅኑና ያዳምጣሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
309.	የጤና ባለሙያዎች አስፈላጊውን የአካል ምርመራ ያደርጋሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
310.	በጤና ጣቢያው ውስጥ አስፈላጊ የላቦራቶሪ ምርመራዎች ይደረጋሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
311.	የጤና ባለሙያዎቹ ታካሚውን በሚገባ መርምረው የበሽታውን አይነት በትክክል ይለያሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

312.	የጤና ባለሙያዎች ለታካሚው ተገቢውን መድሀኒት ያዛሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
313.	በጤና ባለሙያዎች የሚታዘዙ መድሃኒቶችን ሁሉንም በጤና ተቋሙ ውስጥ ያገኛሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
314.	በጤና ተቋሙ የሚሰጡ ህክምናዎች ፈዋሽነታቸው አስተማማኝ ነው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
315.	ህክምና የሚሰጡ የጤና ባለሙያዎች አስተማማኝ ዕውቀትና ብቃት አላቸው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
316.	የጤና ባለሙያዎች ለታካሚዎቻቸው ሩህሩህ ናቸው ጥሩ እንክብካቤም ያደርጋሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
317.	የጤና ባለሙያዎች ነገሮችን/ሃሳባቸውን እርስዎ በሚረዱት መልኩ ያብራራሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
318.	በጤና ተቋሙ የተደረገልዎት የምርመራ ውጤት በጤና ባለሙያዎች በግልፅ ተብራርቶ ተነግሮዎታል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
319.	የጤና ባለሙያዎች በቤትዎ ስለሚወሰዱ መድሀኒቶች አጠቃቀምና የጎንዮሽ ጉዳት እርስዎ በሚረዱት መልኩ ማብራሪያ ይሰጣሉ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
320.	የድጋፍ ሰጭ ሰራተኞች ሰው ወዳድና ታካሚዎችን ለመርዳት ዝግጁ ናቸው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
321.	ባጠቃላይ በጤና ተቋሙ ሲሰጥዎ የነበረውን የህክምና አገልግሎት ጥራት እንዴት ይገልፁታል?	1 <input type="checkbox"/> ዝቅተኛ	2 <input type="checkbox"/> መጠኛ	3 <input type="checkbox"/> ጥሩ	4 <input type="checkbox"/> በጣም ጥሩ	5 <input type="checkbox"/> እጅግ በጣም ጥሩ

ክፍል 4: ለጤና ባለሙያዎች የሚቀርብ መጠይቅ

ተ.ቁ	መጠይቅ	መልስና ኮድ
401.	በዚህ ጤና ተቋም ውስጥ ለስንት አመት ያህል አገልግለዋል?	_____ ዓመት
402.	አሁን እየሰሩበት ባለው ሙያ በአጠቃላይ ለስንት ዓመት ያህል አገልግለዋል?	_____ ዓመት
403.	የሙያ አይነት	ጤና መኮንን..... 1 ቢ.ኤስ.ሲ. ነርስ 2 ሌላ (ይጠቀስ) _____ 3

ሀ. የሥራ እርካታ		በጥብቅ አልሰማም	አልሰማም	ገለልተኛ	እስማማለሁ	በጥብቅ እስማማለሁ
404.	ሥራዎን ለማከናወን በጤና ተቋሙ በቂ አስተዳደራዊ ድጋፍ ይደረግልኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
405.	የቅርብ ኃላፊዬ ማሻሻያና አስተያየት እንድሰጥ ያበረታታኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
406.	የምፈልገውን አመራርና ድጋፍ ሁሉ ከቅርብ ኃላፊዬ አገኛለሁ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
407.	በመደበኛ ሥራዎ ላይ የተሻለ አፈፃፀም በማስመዘግብበት ሰዓት ተገቢው ዕውቅና ይሰጠኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
408.	የሥራ አፈፃፀሜ ፍትሃዊ በሆነ የመመዘኛ መስፈርት ይገመገማል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
409.	ሥራዎን በሚገባ ለማከናወን የሚያገዙ በቂ የሙያ ስልጠናዎችን ወስኛለሁ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
410.	ከሥራ ባልደረቦቼ ጋር ተስማምተን ሥራችንን በሚገባ እናከናውናለን	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
411.	ከአቅም በላይ የሆነ የሥራ ጫና የለብኝም	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
412.	ሥራዎን ለማከናወን የሚያስፈልጉ መሳሪያዎች አቅርቦቶችና ንብረቶች ሁሉ ይቀርቡልኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
413.	በማገኛቸው ጥቅማጥቅሞችና ክፍያዎች ደስተኛ ነኝ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
414.	በየደረጃው ካሉ የጤና ተቋሙ ሰራተኞችና ኃላፊዎች ጋር በቀላሉ መግባባት እችላለሁ	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
415.	ይህ ጤና ተቋም ለሥራ አመች ቦታ ነው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
ለ. ቁርጠኝነት						
416.	ለዚህ ጤና ተቋም ከፍተኛ የሆነ የባለቤትነት ስሜት እንዳለኝ ይሰማኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
417.	ከዚህ ጤና ተቋም ጋር ስሜታዊ ቁርኝት እንዳለኝ ይሰማኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
418.	በዚህ ጤና ተቋም ውስጥ ልክ የቤተሰብ አባል እንደሆንኩ ይሰማኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
419.	ይህ ጤና ተቋም ለእኔ ትልቅ የግል ትርጉም አለው	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
420.	በእውነቱ የጤና ተቋሙ ችግሮች የራሴ ችግሮች እንደሆኑ ይሰማኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
421.	በዚህ ጤና ተቋም የምሰራው ስራ ልክ የግል ስራዎ እንደሆነ ይሰማኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
422.	የዚህ ጤና ተቋም ሰራተኛ በመሆኔ ከራሳችኛል ይሰማኛል	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Annex 3: Interview Guides

2A: Key Informant Interview Guide

KII Guide 1: District Health Officers

Section I: Opening questions

1. Can you tell us about your roles and responsibilities in the management and functioning of this CBHI scheme?
2. Based on your experience, what do you think are the major factors that have positively contributed to membership growth rates of eligible households?
3. What do you think are the major factors that have made it difficult to achieve high membership growth rates?

Section II: Challenges and Lessons on membership growth

4. What are the challenges that health facilities face after the start of CBHI?
Probe for workload and quality of health care etc.
5. What are the opportunities that CBHI brings to health facilities?
Probe for quality of health care and income generation/ increasing retained fees
6. What are the main challenges faced in mobilizing the community to enroll/renew membership in CBHI?
7. What types of households often join CBHI schemes and why? Probe the possibility of adverse selection, and prevention mechanisms
8. What types of households often renew membership and why? Probe a possibility of adverse selection.
9. How is the re-enrollment practice among scheme members after dropout? What types of households often re-enroll and why?
Probe: adverse selection, the strength of community mobilization
10. The performance of the CBHI schemes varies from district to district: what do you think are the major factors for district variation in membership growth rates? How about factors contributing to variations in net income?

Section III: Quality of health care under the scheme

11. To what extent are health facilities providing quality health care for CBHI scheme members as well as other clients?
12. How would you describe the quality of care provided by health facilities? in terms of:

- a. Waiting time?
 - b. Availability of staff?
 - c. Attitude and commitment of staff?
 - d. Availability of diagnostic facilities?
 - e. Availability of essential medicines?
 - f. Adequacy of the patient waiting areas
 - g. OOP expenditure at the time of receiving care?
13. What are the major complaints from CBHI members on the quality of health services?
14. Are there differences between members and non-members in claiming their rights-i.e. requesting better service? Please elaborate.
15. What are the successes and challenges in terms of the quality of services provided by health facilities?

Section IV: Moral Hazard Issues

16. How has health insurance influenced the health-seeking behavior of people in this community?

Probe for:

- a. Promptness in seeking care
 - b. Frequency of facility attendance
 - c. Adherence to therapy
17. Are there some behaviors that CBHI members do which can adversely affect the scheme? If so, what are these?

Probe for:

- a. Using another person's card to seek care
 - b. Using expired cards
 - c. Attending health facility to collect drugs for uninsured
 - d. Attending health facility to collect drugs for sale or reserve at home
 - e. Have you ever encountered or heard of any other behavior?
18. Which of these behaviors frequently occur?
19. Do registered members ask for particular drugs to be prescribed/lab tests for them? Why?
20. How is the referral of the CBHI members being carried out? Do they ask for a referral for simple cases?

21. How do these behaviors affect the financial viability of the scheme?
22. What measures are in place to prevent such behaviors? What can be done to minimize such behaviors?
23. Are there some behaviors that health providers do which can adversely affect the scheme? If so, what are these?

Probe for:

- a. Prescribing expensive drugs/lab. Tests
 - b. Over-prescription
 - c. Unnecessary referral
 - d. Prescribing for the uninsured on behalf of the insured
 - e. Other behaviors
24. How often do these behaviors occur?
 25. How do these behaviors affect the financial viability of the scheme?
 26. What measures are in place to prevent such behaviors? What can be done to minimize such behaviors?
 27. How successful is the CBHI scheme in terms of reducing unnecessary patient and provider behaviors (moral hazard)?

Section V: Fraudulent practice

28. Are there instances of fraud and abuse in CBHI financial resources management in the Zone and specifically in the study districts?

If yes: Probe the form of fraud and abuse, and what actions have been taken.

Final Considerations

29. Overall, what are the main challenges for scheme performance and sustainability?
30. We've talked about a lot of issues related to CBHI schemes, is there anything else you'd like to add to our discussion?

We thank you very much for your time and participation in this study.

KII Guide 2: Health insurance personnel

Section I: Opening questions

1. Can you tell us about your roles and responsibilities in the management and functioning of this CBHI scheme?
2. Based on your experience, what do you think are the major factors that have positively contributed to membership growth rates of eligible households?
3. What do you think are the major factors that have made it difficult to achieve high membership growth rates?

Section II: Issues related to membership growth

4. How people are willing to enroll in the scheme? Why did they decline to enroll?
5. How members are willing to renew their membership? Why do they decline to renew?
6. How do you mobilize households towards CBHI enrollment/renewal?
7. What mechanisms are in place to motivate people to enroll/renew their membership?
Probe: types of positive or negative incentives used, and the existence of enforcement.
8. What types of households often join CBHI schemes and why? Probe the possibility of adverse selection, and prevention mechanisms
9. What types of households often renew membership and why? Probe a possibility of adverse selection.
10. How is the re-enrollment practice among members after dropout? Who often re-enrolls and why? Probe: adverse selection, the strength of community mobilization
11. What are the main challenges you face when you mobilize the community for enrollment and renewal and collecting premiums?
12. What are the major complaints of members in this regard, if any?

Section III: Quality of health care under the scheme

13. To what extent are health facilities providing quality health care for CBHI scheme members as well as other clients?
14. How would you describe the quality of care provided by health facilities? in terms of:
 - a. Waiting time?
 - b. Availability of staff?
 - c. Attitude and commitment of staff?
 - d. Availability of diagnostic facilities?
 - e. Availability of essential medicines?
 - f. Adequacy of the patient waiting areas
 - g. OOP expenditure at the time of receiving care?

15. What are the major complaints from CBHI members on the quality of health services?
16. Are there differences between members and non-members in claiming their rights-i.e. requesting better service? Please elaborate.
17. What are the successes and challenges in terms of the quality of services provided by health facilities?

Section IV: Moral Hazard Issues

18. How has health insurance influenced the health-seeking behavior of people in this community?

Probe for:

- a. Promptness in seeking care
- b. Frequency of facility attendance
- c. Adherence to therapy

19. Are there some behaviors that CBHI members do which can adversely affect the scheme? If so, what are these?

Probe for:

- a. Using another person's card to seek care
- b. Using expired cards
- c. Attending health facility to collect drugs for uninsured
- d. Attending health facility to collect drugs for sale or reserve at home
- e. Have you ever encountered or heard of any other behavior?

20. Which of these behaviors frequently occur?

21. Do registered members ask for particular drugs to be prescribed/lab tests for them? Why?

22. How is the referral of the CBHI members being carried out? Any specific challenges? Do they ask for a referral for simple cases? How do they react when their expectation is not met?

23. How do these behaviors affect the financial viability of the scheme?

24. What measures are in place to prevent such behaviors? What can be done to minimize such behaviors?

25. Are there some behaviors that health providers do which can adversely affect the scheme? If so, what are these?

Probe for:

- a. Prescribing expensive drugs/lab. Tests
- b. Over-prescription

- c. Unnecessary referral
 - d. Prescribing for the uninsured on behalf of the insured
 - e. Other behaviors
26. How often do these behaviors occur?
27. How do these behaviors affect the financial viability of the scheme?
28. What measures are in place to prevent such behaviors? What can be done to reduce them?
29. How successful is the CBHI scheme in terms of reducing unnecessary patient and provider behaviors (moral hazard)?

Section V: Claims settlement

30. How would you describe your office's relationship with the service providers?
31. How timely is the claims reimbursement for health facilities? Probe to compare the stipulated time and the reimbursement, and any reason for delays.
32. How would you describe the claims submission process of health facilities? Probe
- a. Timeliness and accuracy.
 - b. How do you check the accuracy of claims submitted?
33. How would you describe the claims rejection practice? How common is the rejection of the claims? Reasons for rejection?
34. What do people feel when their claims are rejected?
35. What is the main cost driver of the claims expense? Probe for the type of service and behaviors of different stakeholders, raising of cost of medicines
36. How do you compare the claims expense vs. the premium contribution?
37. Overall, what is the financial status of the CBHI? Probe: If the surplus is increasing over time, why is this so? If there is a negative net income, discuss the possible reasons.

Section VI: Fraudulent practice

38. Are there instances of fraud and abuse in CBHI financial resources management in the Zone as well as in your district?
- If yes: Probe the form of fraud and abuse, and what actions have been taken.

Final Considerations

39. Overall, what are the main challenges for scheme performance and sustainability?
40. We've talked about a lot of issues related to CBHI schemes, is there anything else you'd like to add to our discussion?

We thank you very much for your time and participation in this study.

KII Guide 3: Health care providers and managers

Section I: Quality of health care under the scheme

1. To what extent are health facilities providing quality health care for CBHI scheme members as well as other clients?
2. How would you describe the quality of care provided by health facilities? in terms of:
 - a. Waiting time?
 - b. Availability of staff?
 - c. Attitude and commitment of staff?
 - d. Availability of diagnostic facilities?
 - e. Availability of essential medicines?
 - f. Adequacy of the patient waiting areas
 - g. OOP expenditure at the time of receiving care?
3. What are the major complaints from CBHI members on the quality of health services?
4. Are there differences between members and non-members in claiming their rights, i.e. requesting better service? Please elaborate.
5. What are the successes and challenges in terms of the quality of health services?

Section II: Moral Hazard Issues

6. What can you say about patient attendance at this facility before and after the introduction of health insurance?
7. How has health insurance influenced the health-seeking behavior of people in this community? Probe for:
 - a. Promptness in seeking care
 - b. Frequency of facility attendance
 - c. Adherence to therapy
8. Are there some behaviors that CBHI members do which can adversely affect the scheme? If so, what are these? Probe for:
 - a. Using another person's card to seek care
 - b. Using expired cards
 - c. Attending health facility to collect drugs for uninsured
 - d. Attending health facility to collect drugs for sale or reserve at home
 - e. Have you ever encountered or heard of any other behavior?
9. Which of these behaviors frequently occur?
10. Do registered members ask for particular drugs to be prescribed/lab tests for them? Why?

11. How is the referral of CBHI members carried out? Any specific challenges? Do they ask for a referral for simple cases? How do they react when their expectation is not met?
12. What measures are in place to prevent such behaviors? What can be done to reduce them?
13. Are there some behaviors that health providers do which can adversely affect the scheme? If so, what are these?

Probe for:

- a. Prescribing expensive drugs/lab. Tests
 - b. Over-prescription
 - c. Unnecessary referral
 - d. Prescribing for the uninsured on behalf of the insured
 - e. Other behaviors
14. How often do these behaviors occur?
 15. What can be done to minimize such behaviors?

Section III: Effect of CBHI on service delivery

16. What are some of the problems or challenges you face with the insurance system?

Probe for:

- a. Workload
 - b. Over expectations from clients
 - c. demand from clients
 - d. quality of health care etc.
17. What are the opportunities that CBHI brings to health facilities?
Probe for quality of health care and income generation/ increasing retained fees
 18. How would you describe your facility's relationship with the CBHI scheme?
 19. How would you describe the claims submission process of health facilities? Probe on timeliness and accuracy.
 20. How frequently do you request and collect claims for the expenses you incurred for CBHI members? Do you face any challenges in the process?
 21. How timely is the claims reimbursement for health facilities? Probe to compare the stipulated time and the reimbursement.

Final Considerations

22. We've talked about a lot of issues related to CBHI schemes, is there anything else you'd like to add to our discussion?

We thank you very much for your time and participation in this study.

KII Guide 4: Health Extension Workers and Kebele leaders

Section I: Opening Questions

1. Can you tell us about your roles and responsibilities in the functioning of CBHI in your *Kebele*? For how long?
2. Based on your experience, what do you think are the major factors that have positively contributed to membership growth rates of eligible households?
3. What do you think are the major factors that have made it difficult to achieve high membership growth rates?

Section II: Membership growth

4. How people are willing to enroll in the scheme? Why did they decline to enroll?
5. How scheme members are willing to renew their membership? Why do they decline to renew?
6. How do you mobilize households towards CBHI enrollment/renewal?
7. What mechanisms are in place to motivate beneficiaries to enroll/renew their membership?
Probe: types of positive or negative incentives used, and the existence of enforcement.
8. What types of households often join CBHI schemes and why? Probe the possibility of adverse selection, and prevention mechanisms
9. What types of households often renew membership and why? Probe a possibility of adverse selection.
10. How is the re-enrollment practice among scheme members after dropout? What types of households often re-enroll and why?
Probe: adverse selection, the strength of community mobilization
11. What are the main challenges you face when you mobilize the community for enrollment and renewal and collecting premiums?
12. What are the major complaints of members in this regard, if any?

Section III: Quality of health care under the scheme

13. To what extent are health facilities providing quality health care for CBHI scheme members as well as other clients?
14. How would you describe the quality of care provided by health facilities? in terms of:
 - a. Waiting time?
 - b. Availability of staff?

- c. Attitude and commitment of staff?
 - d. Availability of diagnostic facilities?
 - e. Availability of essential medicines?
 - f. Adequacy of the patient waiting areas
 - g. OOP expenditure at the time of receiving care?
15. What are the major complaints from CBHI members on the quality of health services?
16. Are there differences between members and non-members in claiming their rights-i.e., requesting better service? Please elaborate.
17. What are the successes and challenges in terms of the quality of services provided by health facilities?

Section IV: Moral Hazard Issues

18. How has health insurance influenced the health-seeking behavior of people in this community?
- Probe for:
- d. Promptness in seeking care
 - e. Frequency of facility attendance
 - f. Adherence to therapy
19. Are there some behaviors that CBHI members do which can adversely affect the scheme? If so, what are these?
- Probe for:
- f. Using another person's card to seek care
 - g. Using expired cards
 - h. Attending health facility to collect drugs for uninsured
 - i. Attending health facility to collect drugs for sale or reserve at home
 - j. Have you ever encountered or heard of any other behavior?
20. Which of these behaviors frequently occur?
21. Do registered members ask for particular drugs to be prescribed/lab tests for them? Why?
22. Are there challenges related to the referral of the CBHI members? Do they ask for a referral for simple cases? How do they react when their expectation is not met?
23. What measures are in place to prevent such behaviors? What can be done to minimize such behaviors?

24. Are there some behaviors that health providers do which can adversely affect the scheme? If so, what are these?

Probe for:

- a. Prescribing expensive drugs/lab. Tests
- b. Over-prescription
- c. Unnecessary referral
- d. Prescribing for the uninsured on behalf of the insured
- e. Other behaviors

25. How often do these behaviors occur?

26. What measures are in place to prevent such behaviors? What can be done to minimize such behaviors?

27. How successful is the CBHI scheme in terms of reducing unnecessary patient and provider behaviors (moral hazard)?

Final Considerations

28. Overall, what are the main challenges for scheme performance and sustainability?

29. We've talked about a lot of issues related to CBHI schemes, is there anything else you'd like to add to our discussion?

We thank you very much for your time and participation in this study.

2B: In-Depth Interview Guide

Section I: Background Characteristics of Respondents

1. Age (In completed years) _____
2. Sex _____
3. Marital status _____
4. Level of education _____
5. Insurance status _____

Section II: Perception of the quality of health care (Objective II)

1. Which health facility is the usual source of health care for your household?
2. How many times have a member of this household visited the health facility in the last six months, and 12 months?
3. Based on your view, to what extent CBHI members are satisfied with the health care provision?
4. What is your perception about the quality of care received from CBHI contracted facilities?

Probe to describe it in terms of:

- a. Waiting time. How long to wait to see a health care provider?
 - b. Availability of staff. Explain.
 - c. Attitude and commitment of staff. Explain.
 - d. Competency of health care providers. Explain
 - e. Availability of diagnostic facilities. Explain.
 - f. Availability of essential medicines. Explain.
 - g. Cleanliness of the facilities. Explain.
 - h. Adequacy of the patient waiting areas. Explain.
 - i. The referral system? Explain.
5. At the health facilities, do those who have health insurance receive the same services as those who have no insurance?

If NO, what are the differences? Which of them is treated better? Why?

Probe for:

- a. Waiting time
- b. Serving patients based on a “first come first served” basis
- c. Courtesy and respect

- d. Listening to your concerns
 - e. Giving sufficient time for consultation
 - f. Doing physical examination
 - g. Ordering the required diagnostic approach?
 - h. The quality of medicines prescribed
6. How do Health center assistants are friendly and helpful to patients?
 7. What other challenges do you and other members face in receiving health care?

Section III: Perception of the scheme (Objective III)

8. When did you join the CBHI scheme?
9. For how many years you became a scheme member?
10. How people are willing to enroll in the scheme? Why did they decline to enroll?
11. How scheme members are willing to renew their membership? Why do they decline to renew? (For dropouts): why you did not renew the membership?
12. What was your main motivation(s) for subscribing to the CBHI? Has anybody ever convinced/encouraged or enforced you to subscribe?
13. Is there enforcement from government officials for enrollment and renewal? How?
14. What types of households often join CBHI schemes and why? Probe the possibility of adverse selection, and prevention mechanisms
15. What types of households often renew membership and why? Probe a possibility of adverse selection.
16. How is the re-enrollment practice among scheme members after dropout? What types of households often re-enroll and why?
 Probe: adverse selection, the strength of community mobilization
17. How would you describe the yearly premium paid by CBHI subscribers? (Probe for the premium being either affordable or expensive).
18. As a member of the schemes, what are the major benefits you got? What benefits other members got?
19. Does the CBHI prevent you and other members from OOP payment at the time of receiving health care? Do patients forego treatment due to the unaffordability of care?
20. What is your position on the fact that the CBHI provides a form of financial protection against unforeseen health challenges?

21. How would you describe the claims reimbursement practice for patients who spent OOP payments?
22. Was there a time that your claim was rejected by the scheme? Why? How did you feel? How common is the rejection of the claims?
23. What do people feel when their claims are rejected? What do the members decide when their claims are rejected?
24. How satisfied are you with the scheme services? Probe convenience of card collection, premium collection, and waiting time at the scheme office.
25. What are the things that people do not like about the health insurance scheme?
26. What are the things that people like about the health insurance scheme?
27. What should be adjusted to make the health insurance scheme better?

Section IV: Moral Hazard Issues (Objective III)

28. How has health insurance influenced the health-seeking behavior of people in this community?
Probe for:
 - a. Promptness in seeking care
 - b. Frequency of facility attendance
 - c. Adherence to therapy
29. Do you see any differences in the behavior of people who have health insurance compared to those who do not have insurance?
 - If YES, what are the differences?
30. Do registered members ask for particular drugs to be prescribed/lab tests for them? Why?
31. Are there challenges related to the referral of the CBHI members? Do they ask for a referral for simple cases? How do they react when their expectation is not met?
32. Have you noticed any changes in the way people go to health facilities since insurance was introduced?
 - If YES, what has changed? Why is that so?
33. Some people who are insured go to a health facility to collect drugs for their sick relatives or friends who are not insured. How often does this happen? Is it right to do so?
34. Some people who are insured sometimes give their cards to their friends or relatives who are not insured to go to the health facility. How often does this happen? Is it right?

35. You have registered with the scheme but as a scheme member you have not fallen sick and the year is ending do you have to visit the health facility even though you are not sick?
 - If YES, why? and If NO, why not?
36. Have you ever encountered any of the above or any other behavior among other scheme members? How often do these behaviors occur?
37. Would you believe that subscribers with chronic diseases should pay more than the healthy?
38. Would you believe that subscribers should pay the same contribution to whatever health services are used?

Final Considerations

39. We've talked about a lot of issues related to CBHI schemes, is there anything else you'd like to add to our discussion?

We thank you very much for your time and participation in this study.

Annex 2: Interview Guides (የአማርኛ ቃለመጠይቅ መመሪያ)

2A: Key Informant Interview Guide

ቃለመጠይቅ መመሪያ 1: ከወረዳ ጤና ጽ/ቤት ባለሙያዎች ጋር ለሚደረግ ውይይት

ክፍል 1: የመግቢያ ጥያቄዎች

1. በማህበረሰብ አቀፍ ጤና መድሀኒት ትግበራና አመራር ላይ የርስዎ የሥራ ድርሻና ኃላፊነት ምን እንደሆነ ቢገልጹልኝ
2. ካለዎት ተሞክሮ አኳያ፣ የማህበረሰብ አቀፍ ጤና መድሀኒት አባላትን ቁጥር ለማሳደግ በአወንታዊ መልኩ ሊነሱ የሚችሉ ዋና ዋና ምክንያቶች ምን ምን ናቸው?
3. የማህበረሰብ አቀፍ ጤና መድሀኒት አባላትን ቁጥር ለማሳደግ አስቸጋሪ የሚያደርጉት ዋና ዋና ምክንያቶች ምን ምን ናቸው ብለው ያስባሉ?

ክፍል 2: አባላትን ለማፍራት ያጋጠሙ ተግዳሮቶችና መልካም ተሞክሮዎች

4. የማህበረሰብ አቀፍ ጤና መድሀኒት ከተጀመረ ወዲህ የጤና ተቋማት ምን ምን ተግዳሮቶች አጋጠሟቸው?
 - መርምር: ስለ ሥራ ጫና እና የጤና አገልግሎት ጥራት
5. የማህበረሰብ አቀፍ ጤና መድሀኒት ለጤና ተቋማት ምን መልካም አጋጣሚ ይዘላቸው መጣ?
 - መርምር: ስለጤና አገልግሎት ጥራት መሻሻልና ገቢ መጨመር
6. ማህበረሰቡን ለአባላት ምዝገባ ወይም ለእድሳት ቅስቀሳ በሚደረግበት ጊዜ የሚያጋጥሙ ዋና ዋና ተግዳሮቶች/ችግሮች ምን ምን ናቸው?
7. ምን አይነት የቤተሰብ አባላት ናቸው በብዛት የማህበረሰብ አቀፍ ጤና መድሀኒት አባል መሆን የሚፈልጉት? ለምን?
 - መርምር: ጎጅ ምርጫ (adverse selection) እና ስለመከላከያው
8. ምን አይነት የቤተሰብ አባላት ናቸው በብዛት የማህበረሰብ አቀፍ ጤና መድሀኒት አባልነታቸውን የሚያድሱት? ለምን?
 - መርምር: ጎጅ ምርጫ (adverse selection)
9. የማህበረሰብ አቀፍ ጤና መድሀኒት አባልነታቸውን ካቋረጡ በኋላ እንደገና የሚመዘገቡ አባላት በብዛት አሉ? በብዛት ምን አይነት የቤተሰብ አባላት ናቸው ካቋረጡ በኋላ እንደገና የሚመዘገቡት? ለምን?
 - መርምር: ጎጅ ምርጫ (adverse selection) ወይስ የማህበረሰብ ቅስቀሳ መጠናከር
10. የማህበረሰብ አቀፍ ጤና መድሀኒት አፈፃፀም ከወረዳ ወረዳ ልዩነቶች ያሳያል። የአባላትን ቁጥር ከማሳደግ አንፃር ለታዩት የአፈፃፀም ልዩነቶች ዋና ዋና ምክንያቶች ምን ምን ናቸው ብለው ያስባሉ? ከንጥር ገቢ አኳያስ?

ክፍል 3: የጤና አገልግሎት ጥራት

11. የጤና ተቋማት ለጤና መድሀኒት አባላትና ለሌሎች ተገልጋዮች የሚሰጡት የጤና አገልግሎት ጥራት እንዴት ይገመግሙታል?
12. የሚሰጠውን የጤና አገልግሎት ጥራት ከሚከተሉት መስፈርቶች አንፃር እንዴት ይገመግሙታል?

ሀ. ወረፋና ቀልጣፋ አገልግሎት መስጠት?

ለ. በቂ የጤና ባለሙያ መኖር?

ሐ. የጤና ባለሙያዎች የሥራ ተነሳሽነት, ስነምግባርና ለጤና መድሀን አባላት ያላቸው አመለካከት መ. የምርመራ መሳሪያዎችና አቅርቦት?

ሠ. የአስፈላጊ መድሃኒቶች መገኘት?

ረ. በቂ የታካሚዎች ማረፊያ ክፍል መኖር?

ሰ. በህክምና ሰዓት ታካሚዎች ከኪስ የሚከፍሉትን ክፍያ መቀነስ?

13. የጤና አገልግሎት ጥራትን በተመለከተ የጤና መድሀን አባላት በአብዛኛው ጊዜ የሚያነሱባቸው ቅሬታዎች ምን ምን ናቸው?

14. የጤና መድሀን አባል በሆኑና ባልሆኑ ታካሚዎች መካከል መብትን ከመጠየቅ (የተሻለ አገልግሎት ከመጠየቅ) አኳያ የታየ ልዩነት አለ? በምሳሌ ቢያብራሩ

15. የጤና መድሀን ከተጀመረ ወዲህ ከጤና አገልግሎት ጥራት አኳያ የታዩ ለውጦችና ያጋጠሙ ተግዳሮቶች ምን ምን ናቸው?

ክፍል 4: የሞራል አደጋ (Moral hazard)

16. የማህበረሰብ አቀፍ የጤና መድሀን መጀመር የማህበረሰቡን ወደ ጤና ተቋም የመሄድ ልምድ ምን ያህል ቀይሮታል?

መርምር: ሀ. በአፋጣኝ ወደ ጤና ተቋም ለህክምና መሄድ

ለ. ጤና ተቋም በተደጋጋሚ መጎብኘት

ሐ. መድሃኒት በአግባቡ መውሰድ

17. በጤና መድሀን አባላት የሚፈጸሙ የጤና መድሀኑን ሊጎዱ የሚችሉ ተግባራት አሉ? ካሉ ምን ምን ናቸው?

መርምር: ሀ. የሌላ ሰው መታወቂያ ካርድ ይዞ ለመታከም መሞከር

ለ. ያልታደሰ መታወቂያ ካርድ ይዞ ለመታከም መሞከር

ሐ. አባል ላልሆነ ሰው መድሃኒት ለመውሰድ ወደ ጤና ተቋም መሄድ

መ. መድሃኒቶችን ወስዶ ለመሸጥ ወይም ለማክማቸት በማሰብ ወደ ጤና ተቋም መሄድ

ሠ. ሌሎች ተግባራት?

18. ከነዚህ ተግባራት መካከል በብዛት የሚስተዋሉት የትኞቹ ናቸው?

19. የጤና መድሀን አባላት በራሳቸው ምርጫ የተለየ መድሃኒት ወይም ላቦራቶሪ እንዲታዘዝላቸው ይጠይቃሉ? ለምን?

20. የጤና መድሀን አባላትን በተመለከተ የቅብብሎሽ ስርዓቱ እንዴት እየተተገበረ ነው? ከዚህ ጋር ተያይዞ ምን ምን ችግሮች አሉ? ለቀላል የጤና ችግሮች ሪፈር እንዲባሉ የሚፈልጉ ታካሚዎች አሉ? ለምን?

21. እነዚህ ተግባራት በጤና መድሀኑ የፋይናንስ ዘላቂነት ላይ ያላቸው ተፅዕኖ እንዴት ይገለጻል?

22. እነዚህን ተግባራት ለመከላከል እየተወሰዱ ያሉ የመፍትሄ አቅጣጫዎች ምን ምን ናቸው? ቀጣይስ ምን መደረግ አለበት ይላሉ?

23. በጤና ባለሙያዎች የሚፈጸሙ የጤና መድሀኑን ሊጎዱ የሚችሉ ተግባራት አሉ? ካሉ ምን ምን ናቸው?

መርምር: ሀ. ውድ መድሃኒት እና ላቦራቶሪ ማዘዝ

ለ. ከሚያስፈልገው በላይ ማዘዝ

ሐ. አላስፈላጊ የሆነ ሪፈራል

መ. አባል ላልሆኑ ታካሚዎች በአባል ታካሚ ስም መድሃኒት እንዲያገኙ ማድረግ

ሠ. ሌሎች ተግባራት?

24. እነዚህ ተግባራት መካከል በብዛት የሚስተዋሉት የትኞቹ ናቸው?

25. እነዚህ ተግባራት በጤና መድሃኒት የፋይናንስ ዘላቂነት ላይ ያላቸው ተፅዕኖ እንዴት ይገለጻል?

26. እነዚህን ተግባራት ለመከላከል እየተወሰዱ ያሉ የመፍትሄ አቅጣጫዎች ምን ምን ናቸው? ቀጣይስ ምን መደረግ አለበት ይላሉ?

27. የጤና መድሃኒት እነዚህን አላስፈላጊ የሆኑ የታካሚና የጤና ባለሙያ ባህሪያት/ተግባራት ከመቀነስ አኳያ ምን ያህል ስኬታማ ነው ይላሉ?

ክፍል 5: የማጭበርበር ተግባር

28. በአጠቃላይ በወረዳችሁ የጤና መድሃኒት ገንዘብ አላግባብ የመጠቀም እና የማጭበርበር አጋጣሚዎች ነበሩ?

➤ መርምር: ምን ምን አይነት ተግባራት እንደተፈፀሙና የተወሰዱ እርምጃዎችን

ማጠቃለያ

29. በአጠቃላይ የጤና መድሃኒት ጥሩ አፈፃፀም እና ዘላቂነት እንዳይኖረው የሚፈታተኑ ተግዳሮቶችና እንቅፋቶች ምን ምን ናቸው?

30. የማህበረሰብ አቀፍ ጤና መድሃኒትን በተመለከተ ብዙ ጉዳዮችን አንስተናል። እስካሁን በተወያየንባቸው ጉዳዮች ላይ የሚጨምሩት ሃሳብ ካለ?

ቃለምልልስን ጨርሰናል ለነበረን ቆይታ በጣም እናመሰግናለን!

ቃለመጠይቅ መመሪያ 2: ከጤና መድሀን ተቋም ሰራተኞች ጋር ለሚደረግ ውይይት

ክፍል 1: የመግቢያ ጥያቄዎች

1. በጤና መድሀን ትግበራና አመራር ላይ የርስዎ የሥራ ድርሻና ኃላፊነት ምን እንደሆነ ቢገልጹልኝ
2. ካለዎት ተሞክሮ አኳያ፣ የማህበረሰብ አቀፍ ጤና መድሀን አባላትን ቁጥር ለማሳደግ በአወንታዊ መልኩ ሊነሱ የሚችሉ ዋና ዋና ምክንያቶች ምን ምን ናቸው?
3. የማህበረሰብ አቀፍ ጤና መድሀን አባላትን ቁጥር ለማሳደግ አስቸጋሪ የሚያደርጉት ዋና ዋና ምክንያቶች ምን ምን ናቸው ብለው ያስባሉ?

ክፍል 2: አባላትን ማፍራት

4. ማህበረሰቡ ለጤና መድሀን አባልነት ለመመዘገብ ያለው ፍላጎት ምን ይመስላል? አባል ለመሆን የማይፈልጉት ለምንድን ነው?
5. የጤና መድሀን አባላት አባልነታቸውን ለማደስ ያላቸው ፍላጎት ምን ይመስላል? ለምን ያቋርጣሉ?
6. ማህበረሰቡን ለአባልነት ምዝገባ ወይም ለዕድሳት በምን መልኩ ነው ቅስቀሳ የምታደርጉለት?
7. ማህበረሰቡ ለጤና መድሀን አባል እንዲሆን እና አባልነቱን እንዲያድስ ምን አይነት የማነቃቂያ ዘዴዎችን ትጠቀማላችሁ?
 - መርምር: አወንታዊና አሉታዊ ማነቃቂያ አይነቶች፣ ማስገደድስ አለ?
8. ምን አይነት የቤተሰብ አባላት ናቸው በብዛት የማህበረሰብ አቀፍ ጤና መድሀን አባል መሆን የሚፈልጉት? ለምን? መርምር: ጎጂ ምርጫ (adverse selection) እና ስለመከላከያው
9. ምን አይነት የቤተሰብ አባላት ናቸው በብዛት የጤና መድሀን አባልነታቸውን የሚያድሱት? ለምን?
 - መርምር: ጎጂ ምርጫ (adverse selection)
10. የማህበረሰብ አቀፍ ጤና መድሀን አባልነታቸውን ካቋረጡ በኋላ እንደገና የሚመዘገቡ አባላት በብዛት አሉ? በብዛት ምን አይነት የቤተሰብ አባላት ናቸው ካቋረጡ በኋላ እንደገና የሚመዘገቡት? ለምን?
 - መርምር: ጎጂ ምርጫ (adverse selection) ወይስ የማህበረሰብ ቅስቀሳ መጠናከር
11. ማህበረሰቡን ለአባላት ምዝገባ ወይም ለእድሳት ቅስቀሳ በሚደረግበት ጊዜ መዋጮ በሚሰበሰቡበት ወቅት የሚያጋጥሙ ዋና ዋና ተግዳሮቶች/ችግሮች ምን ምን ናቸው?
12. በቅስቀሳ እና መዋጮ በሚሰበሰቡበት ሰዓት ከማህበረሰቡ የሚነሱ ዋና ዋና ቅሬታዎች ምን ምን ናቸው?

ክፍል 3: የጤና አገልግሎት ጥራት

13. የጤና ተቋማት ለጤና መድሀን አባላትና ለሌሎች ተገልጋዮች የሚሰጡት የጤና አገልግሎት ጥራት እንዴት ይገመግሙታል?
14. የሚሰጠውን የጤና አገልግሎት ጥራት ከሚከተሉት መስፈርቶች አንፃር እንዴት ይገመግሙታል?
 - ሀ. ወረፋና ቀልጣፋ አገልግሎት መስጠት?
 - ለ. በቂ የጤና ባለሙያ መኖር?
 - ሐ. የጤና ባለሙያዎች የሥራ ተነሳሽነት, ስነምግባርና ለጤና መድሀን አባላት ያላቸው አመለካከት መ. የምርመራ መሳሪያዎችና አቅርቦት?
 - ሠ. የአስፈላጊ መድሃኒቶች መገኘት?
 - ረ. በህክምና ሰዓት ታካሚዎች ከኪስ የሚከፍሉትን ክፍያ ከመቀነስ አኳያ?

15. የጤና አገልግሎት ጥራትን በተመለከተ የጤና መድሀን አባላት በአብዛኛው ጊዜ የሚያነሱባቸው ቅሬታዎች ምን ምን ናቸው?

16. ከጤና አገልግሎት ጥራት አኳያ የታዩ ለውጦችና ያጋጠሙ ተግዳሮቶች ምን ምን ናቸው?

ክፍል 4: የሞራል አደጋ (Moral hazard)

17. የማህበረሰብ አቀፍ የጤና መድሀን መጀመር የማህበረሰቡን የመታከም ልምድ ምን ያህል ቀይሮታል?

- መርምር: ሀ. በአፋጣኝ ወደ ጤና ተቋም ለህክምና መሄድ
- ለ. ጤና ተቋም በተደጋጋሚ መጎብኘት
- ሐ. መድሃኒት በአግባቡ መውሰድ

18. በጤና መድሀን አባላት የሚፈጸሙ የጤና መድሀኑን ሊጎዱ የሚችሉ ተግባራት አሉ? ካሉ ምን ምን ናቸው?

- መርምር: ሀ. የሌላ ሰው መታወቂያ ካርድ ይዞ ለመታከም መሞከር
- ለ. ያልታደሰ መታወቂያ ካርድ ይዞ ለመታከም መሞከር
- ሐ. አባል ላልሆነ ሰው መድሃኒት ለመውሰድ ወደ ጤና ተቋም መሄድ
- መ. መድሃኒቶችን ወስዶ ለመሸጥ ወይም ለማከማቸት በማሰብ ወደ ጤና ተቋም መሄድ
- ሠ. ሌሎች ተግባራት?

19. ከነዚህ ተግባራት መካከል በብዛት የሚስተዋሉት የትኞቹ ናቸው?

20. የጤና መድሀን አባላት በራሳቸው ምርጫ የተለየ መድሃኒት ወይም ላቦራቶሪ እንዲታዘዝላቸው ይጠይቃሉ? ለምን?

21. የጤና መድሀን አባላትን በተመለከተ የቅብብሎሽ ስርዓቱ እንዴት እየተተገበረ ነው? ከዚህ ጋር ተያይዞ ምን ምን ችግሮች አሉ? ለቀላል የጤና ችግሮች ሪፈር እንዲባሉ የሚፈልጉ ታካሚዎች አሉ? ለምን? ፍላጎታቸው አልሳካ ሲል ምላሻቸው ምን ይመስላል?

22. እነዚህ ተግባራት በጤና መድሀኑ የፋይናንስ ዘላቂነት ላይ ያላቸው ተፅዕኖ እንዴት ይገለጻል?

23. እነዚህን ተግባራት ለመከላከል እየተወሰዱ ያሉ የመፍትሄ አቅጣጫዎች ምን ምን ናቸው? ቀጣይስ ምን መደረግ አለበት ይላሉ?

24. በጤና ባለሙያዎች የሚፈጸሙ የጤና መድሀኑን ሊጎዱ የሚችሉ ተግባራት አሉ? ካሉ ምን ምን ናቸው?

- መርምር: ሀ. ውድ መድሃኒት እና ላቦራቶሪ ማዘዝ
- ለ. ከሚያስፈልገው በላይ ማዘዝ
- ሐ. አላስፈላጊ የሆነ ሪፈራል
- መ. አባል ላልሆኑ ታካሚዎች በአባል ታካሚ ስም መድሃኒት እንዲያገኙ ማድረግ
- ሠ. ሌሎች ተግባራት?

25. ከነዚህ ተግባራት መካከል በብዛት የሚስተዋሉት የትኞቹ ናቸው?

26. እነዚህ ተግባራት በጤና መድሀኑ የፋይናንስ ዘላቂነት ላይ ያላቸው ተፅዕኖ እንዴት ይገለጻል?

27. እነዚህን ተግባራት ለመከላከል እየተወሰዱ ያሉ የመፍትሄ አቅጣጫዎች ምን ምን ናቸው? ቀጣይስ ምን መደረግ አለበት ይላሉ?

28. የጤና መድሀኑ እነዚህን አላስፈላጊ የሆኑ የታካሚና የጤና ባለሙያ ባህሪያት/ተግባራት ከመቀነስ አኳያ ምን ያህል ስኬታማ ነው ይላሉ?

ክፈል 5: የጤና አገልግሎት ወጭ ክፍያ አፈፃፀም

29. የጤና መድሀን ተቋሙ ሥራዎችን በጋራ ተባብሮ ከመሥራት አንፃር ከጤና ተቋማት ጋር ያለውን ግንኙነት እንዴት ይገመግሙታል?

30. የጤና ተቋማት ለሰጡት የህክምና አገልግሎት ለሚያቀርቡት የክፍያ ጥያቄ ስምምነት በተገባው ቀን መሰረት ክፍያ ይፈፀምላቸዋል?

መርምር: ክፍያው ቃል ከተገባው ጊዜ ዘግይቶ ያውቃል? ለመዘግየት ምክንያቶቹ ምን ምን ናቸው?

31. የጤና ተቋማትን የክፍያ አጠያየቅ ሂደት እንዴት ይገመግሙታል?

መርምር: ሀ. በሰዓቱ እና ትክክለኛነቱ

ለ. ትክክለኛነቱ እንዴት ይረጋገጣል?

32. የጤና አገልግሎት ወጭ ክፍያ ተጠይቆ የሚከለክልበት ሁኔታ አለ? ምክንያቶቹ

33. በታካሚዎች የትክ ክፍያ ጥያቄ ቀርቦ ክፍያ የሚከለክልበት ሁኔታ አለ? ምን ያህል የተለመደ ነው? ለክፍያ መከልከል ምክንያቶቹ ምን ምን ናቸው?

34. አባላት የትክ ክፍያ በሚከለክሉበት ሰዓት ምላሻቸው ምን ይመስላል?

35. የጤና አገልግሎት ወጭ እንዲጨምር የሚያደርጉ ምክንያቶች ምን ምን ናቸው?

መርምር: የመድሃኒት ዋጋ መጨመር፣ ጎጂ ምርጫ፣ የሞራል አደጋ

36. አብዛኛውን የጤና አገልግሎት ወጭ ድርሻ የሚይዙ የጤና አገልግሎት ዓይነቶች ምን ምን ናቸው?

37. የጤና አገልግሎት ወጭ ከአባላት መዋጮ ከሚገኘው ገቢ አኳያ ሲነፃፀር ምን ይመስላል?

38. በአጠቃላይ የጤና መድሀኑ የፋይናንስ ሁኔታ ምን ይመስላል?

መርምር: ሀ. ትርፉ ከጊዜ ወደ ጊዜ እየጨመረ ከመጣ ለምን? አባላት የጤና አገልግሎት ስለማይጠቀሙ?

የአገልግሎት ዋጋ ተመን ዝቅተኛ ስለሆነ? የአባላት መዋጮ ክፍ ያለ ስለሆነ?

ለ. የተጣራ ገቢው ነጋቲቭ ከሆነ ምክንያቶቹ ምን ምን ናቸው

ክፍል 6: የማጭበርበር ተግባር

39. በአጠቃላይ በዞን ደረጃ እንዲሁም በናንተ ወረዳ የጤና መድሀኑን ገንዘብ አላግባብ የመጠቀም እና የማጭበርበር አጋጣሚዎች ነበሩ?

➤ **መርምር:** ምን ምን አይነት ተግባራት እንደተፈፀሙና የተወሰዱ እርምጃዎችን

ማጠቃለያ

40. በአጠቃላይ የጤና መድሀኑ ጥሩ አፈፃፀም እና ዘላቂነት እንዳይኖረው የሚፈታተኑ ተግዳሮቶችና እንቅፋቶች ምን ምን ናቸው

41. የማህበረሰብ አቀፍ ጤና መድሀንን በተመለከተ ብዙ ጉዳዮችን አንስተናል። እስካሁን በተወያየንባቸው ጉዳዮች ላይ የሚጨምሩት ሃሳብ ካለ?

ቃለምልልሱን ጨርሰናል ለነበረን ቆይታ በጣም እናመሰግናለን!

ቃለመጠይቅ መመሪያ 3: ከጤና ተቋም ኃላፊዎችና ጤና ባለሙያዎች ጋር ለሚደረግ ውይይት

ክፍል 1: የጤና አገልግሎት ጥራት

1. የጤና ተቋማት ለጤና መድሀን አባላትና ለሌሎች ተገልጋዮች የሚሰጡት የጤና አገልግሎት ጥራት እንዴት ይገመገሙታል?
2. የሚሰጠውን የጤና አገልግሎት ጥራት ከሚከተሉት መስፈርቶች አንፃር እንዴት ይገመገሙታል?
 - ሀ. ወረፋና ቀልጣፋ አገልግሎት መስጠት?
 - ለ. በቂ የጤና ባለሙያ መኖር?
 - ሐ. የጤና ባለሙያዎች የሥራ ተነሳሽነት, ስነምግባርና ለጤና መድሀን አባላት ያላቸው አመለካከት መ. የምርመራ መሳሪያዎችና አቅርቦት?
 - ሠ. የአስፈላጊ መድሃኒቶች መገኘት?
 - ረ. በቂ የታካሚዎች ማረፊያ ክፍል መኖር?
 - ሰ. በህክምና ሰዓት ታካሚዎች ከኪስ የሚከፍሉትን ክፍያ መቀነስ?
3. የጤና አገልግሎት ጥራትን በተመለከተ የጤና መድሀን አባላት በአብዛኛው ጊዜ የሚያነሱት ቅሬታዎች ምን ምን ናቸው?
4. የጤና መድሀን አባል በሆኑና ባልሆኑ ታካሚዎች መካከል መብትን ከመጠየቅ (የተሻለ አገልግሎት ከመጠየቅ) አኳያ የታዩ ልዩነት አለ? በምሳሌ ቢያብራሩ
5. የጤና መድሀን ከተጀመረ ወዲህ ከጤና አገልግሎት ጥራት አኳያ የታዩ ለውጦችና ያጋጠሙ ተግዳሮቶች ምን ምን ናቸው?

ክፍል 2: የሞራል አደጋ (Moral hazard)

6. የማህበረሰብ አቀፍ ጤና መድሀን ከመጀመሩ በፊትና ከተጀመረ በኋላ በዚህ ጤና ተቋም ያለው የታካሚ ቁጥር ምን ይመስላል?
7. የጤና መድሀን መጀመር የማህበረሰቡን ወደ ጤና ተቋም የመሄድ ልምድ ምን ያህል ቀይሮታል?

መርምር: ሀ. በአፋጣኝ ወደ ጤና ተቋም ለህክምና መሄድ

 - ለ. ጤና ተቋም በተደጋጋሚ መጎብኘት
 - ሐ. መድሃኒት በአግባቡ መውሰድ
8. በጤና መድሀን አባላት የሚፈጸሙ የጤና መድሀኑን ሊጎዱ የሚችሉ ተግባራት አሉ? ምን ምን ናቸው?

መርምር: ሀ. የሌላ ሰው መታወቂያ ካርድ ይዞ ለመታከም መሞከር

 - ለ. ያልታደሰ መታወቂያ ካርድ ይዞ ለመታከም መሞከር
 - ሐ. አባል ላልሆነ ሰው መድሃኒት ለመውሰድ ወደ ጤና ተቋም መሄድ

መ. መድሃኒቶችን ወስዶ ለመሸጥ ወይም ለማከማቸት በማሰብ ወደ ጤና ተቋም መሄድ

ሠ. ሌሎች ተግባራት?
9. ከነዚህ ተግባራት መካከል በብዛት የሚስተዋሉት የትኞቹ ናቸው?
10. የጤና መድሀን አባላት በራሳቸው ምርጫ የተለየ መድሃኒት ወይም ላቦራቶሪ እንዲታዘዝላቸው ይጠይቃሉ? ለምን?

11. የጤና መድሀኒትን አባላትን በተመለከተ የቅብብሎሽ ስርዓቱ እንዴት እየተተገበረ ነው? ከዚህ ጋር ተያይዞ ምን ምን ችግሮች አሉ? ለቀላል የጤና ችግሮች ሪፈር እንዲባሉ የሚፈልጉ ታካሚዎች አሉ? ለምን? ፍላጎታቸው አልሳካ ሲል ምላሻቸው ምን ይመስላል?
12. እነዚህን ተግባራት ለመከላከል እየተወሰዱ ያሉ የመፍትሄ አቅጣጫዎች ምን ምን ናቸው? ቀጣይስ ምን መደረግ አለበት ይላሉ?
13. በጤና ባለሙያዎች የሚፈጸሙ የጤና መድሀኒትን ሊጎዱ የሚችሉ ተግባራት አሉ? ካሉ ምን ምን ናቸው?
መርምር: ሀ. ውድ መድሀኒት እና ላቦራቶሪ ማዘዝ
 ለ. ከሚያስፈልገው በላይ ማዘዝ
 ሐ. አላስፈላጊ የሆነ ሪፈራል
 መ. አባል ላልሆኑ ታካሚዎች በአባል ታካሚ ስም መድሀኒት እንዲያገኙ ማድረግ
 ሠ. ሌሎች ተግባራት?
14. ከነዚህ ተግባራት መካከል በብዛት የሚስተዋሉት የትኞቹ ናቸው?
15. እነዚህን ተግባራት ለመከላከል እየተወሰዱ ያሉ የመፍትሄ አቅጣጫዎች ምን ምን ናቸው? ቀጣይስ ምን መደረግ አለበት ይላሉ?

ክፍል 3: የማህበረሰብ አቀፍ ጤና መድሀኒት በጤና አገልግሎት አሰጣጡ ላይ ያመጣው ተፅዕኖ

16. በማህበረሰብ አቀፍ ጤና መድሀኒት ምክንያት ምን አይነት ችግሮች ወይም ተግዳሮቶች አጋጠሟችሁ?
መርምር: ሀ. የሥራ ጫና
 ለ. ተገልጋዮች ብዙ ነገር እንዲደረግላቸው መጠበቅ
 ሐ. ከተገልጋዮች የሚመጣ ያልተገባ ጥያቄ
 መ. የጤና አገልግሎት ጥራት መቀነስ
17. የማህበረሰብ አቀፍ ጤና መድሀኒት ለጤና ተቋማችሁ ምን መልካም አጋጣሚ ይዞ መጣ?
 > **መርምር:** ስለጤና አገልግሎት ጥራት መሻሻልና ገቢ መጨመር
18. የጤና ተቋሙ ሥራዎችን በጋራ ተባብሮ ከመሥራት አንፃር ከጤና መድሀኒት ተቋሙ ጋር ያለውን ግንኙነት እንዴት ይገመግሙታል?
19. የጤና ተቋሙን የክፍያ አጠያየቅ ሂደት እንዴት ይገመግሙታል?
 > **መርምር:** በሰዓቱ እና ትክክለኛነቱ? ከሂደቱ ጋር ተያይዞ ምን ምን ተግዳሮቶች ያጋጥማሉ?
20. የጤና ተቋሙ ለሚሰጠው የጤና አገልግሎት ወጭ በየስንት ወሩ የክፍያ ጥያቄ ያቀርባል? በየስንት ወሩስ ክፍያ ይፈጸምለታል?
21. የጤና ተቋሙ ለሚያቀርበው የክፍያ ጥያቄ ስምምነት በተገባው ቀን መሰረት ክፍያ ይፈጸምለታል?
መርምር: ክፍያው ቃል ከተገባው ጊዜ ዘገይቶ ያውቃል? ከዚህ ጋር ተያይዞ ምን ምን ችግሮች ያጋጥማሉ?
ማጠቃለያ: የማህበረሰብ አቀፍ ጤና መድሀኒትን በተመለከተ ብዙ ጉዳዮችን አንስተናል። እስካሁን በተወያየንባቸው ጉዳዮች ላይ የሚጨምሩት ሃሳብ ካለ?

ቃለምልልስን ጨርሰናል ለነበረን ቆይታ በጣም እናመሰግናለን!

ቃለመጠይቅ መመሪያ 4: ከጤና ኤክስፔንሽን ስራተኞች እና ቀበሌ አመራሮች ጋር ለሚደረግ ውይይት

ክፍል 1: የመግቢያ ጥያቄዎች

1. በማህበረሰብ አቀፍ ጤና መድሀን አተገባበር የርስዎ የሥራ ድርሻና ኃላፊነት ምን እንደሆነ ቢገልጹልኝ? ለምን ያህል ጊዜ?
2. ካለዎት ተሞክሮ አኳያ፣ የማህበረሰብ አቀፍ ጤና መድሀን አባላትን ቁጥር ለማሳደግ በአወንታዊ መልኩ ሊነሱ የሚችሉ ዋና ዋና ምክንያቶች ምን ምን ናቸው?
3. የማህበረሰብ አቀፍ ጤና መድሀን አባላትን ቁጥር ለማሳደግ አስቸጋሪ የሚያደርጉት ዋና ዋና ምክንያቶች ምን ምን ናቸው ብለው ያስባሉ?

ክፍል 2: አባላትን ማፍራት

4. ማህበረሰቡ ለጤና መድሀን አባልነት ለመመዘገብ ያለው ፍላጎት ምን ይመስላል? አባል ለመሆን የማይፈልጉት ለምንድን ነው?
5. የጤና መድሀን አባላት አባልነታቸውን ለማደስ ያላቸው ፍላጎት ምን ይመስላል? ለምን ያቋርጣሉ?
6. ማህበረሰቡን ለአባልነት ምዝገባ ወይም ለዕድሳት በምን መልኩ ነው ቅስቀሳ የምታደርጉለት?
7. ማህበረሰቡ ለጤና መድሀን አባል እንዲሆን እና አባልነቱን እንዲያደስ ምን አይነት የማነቃቂያ ዘዴዎችን ትጠቀማላችሁ?
 - መርምር: አወንታዊና አሉታዊ ማነቃቂያ አይነቶች፣ ማስገደድስ አለ?
8. ምን አይነት የቤተሰብ አባላት ናቸው በብዛት የማህበረሰብ አቀፍ ጤና መድሀን አባል መሆን የሚፈልጉት? ለምን?
 - መርምር: ጎጆ ምርጫ (adverse selection) እና ስለመከላከያው
9. ምን አይነት የቤተሰብ አባላት ናቸው በብዛት የማህበረሰብ አቀፍ ጤና መድሀን አባልነታቸውን የሚያድሱት? ለምን?
 - መርምር: ጎጆ ምርጫ (adverse selection) ወይስ የማህበረሰብ ቅስቀሳ መጠናከር
10. የማህበረሰብ አቀፍ ጤና መድሀን አባልነታቸውን ካቋረጡ በኋላ እንደገና የሚመዘገቡ አባላት በብዛት አሉ? በብዛት ምን አይነት የቤተሰብ አባላት ናቸው ካቋረጡ በኋላ እንደገና የሚመዘገቡት? ለምን?
 - መርምር: ጎጆ ምርጫ (adverse selection) ወይስ የማህበረሰብ ቅስቀሳ መጠናከር
11. ማህበረሰቡን ለአባላት ምዝገባ ወይም ለእድሳት ቅስቀሳ በሚደረግበት ጊዜና መዋጮ በሚሰበሰቡበት ወቅት የሚያጋጥሙ ዋና ዋና ተግዳሮቶች/ችግሮች ምን ምን ናቸው?
12. በቅስቀሳ እና መዋጮ በሚሰበሰቡበት ሰዓት ከማህበረሰቡ የሚነሱ ዋና ዋና ቅሬታዎች ምን ምን ናቸው?

ክፍል 3: የጤና አገልግሎት ጥራት

13. የጤና ተቋማት ለጤና መድሀን አባላትና ለሌሎች ተገልጋዮች የሚሰጡት የጤና አገልግሎት ጥራት እንዴት ይገመግሙታል?
14. የሚሰጠውን የጤና አገልግሎት ጥራት ከሚከተሉት መስፈርቶች አንፃር እንዴት ይገመግሙታል?
 - ሀ. ወረፋና ቀልጣፋ አገልግሎት መስጠት?
 - ለ. በቂ የጤና ባለሙያ መኖር?
 - ሐ. የጤና ባለሙያዎች የሥራ ተነሳሽነት, ስነምግባርና ለጤና መድሀን አባላት ያላቸው አመለካከት
 - መ. የምርመራ መሳሪያዎችና አቅርቦት?
 - ሠ. የአስፈላጊ መድሃኒቶች መገኘት?
 - ረ. በህክምና ሰዓት ታካሚዎች ከኪስ የሚከፍሉትን ክፍያ መቀነስ?
15. የጤና አገልግሎት ጥራትን በተመለከተ የጤና መድሀን አባላት በአብዛኛው ጊዜ የሚያነሱባቸው ቅሬታዎች ምን ምን ናቸው?
16. የጤና መድሀን አባል በሆኑና ባልሆኑ ታካሚዎች መካከል መብትን ከመጠየቅ (የተሻለ አገልግሎት ከመጠየቅ) አኳያ የታየ ልዩነት አለ? በምሳሌ ቢያብራሩ

17. ከጤና አገልግሎት ጥራት አኳያ የታዩ ለውጦችና ያጋጠሙ ተግዳሮቶች ምን ምን ናቸው?

ክፍል 4: የሞራል አደጋ (Moral hazard)

18. የማህበረሰብ አቀፍ የጤና መድሀን መጀመር የማህበረሰቡን የመታከም/ ህክምና የመሻት ልምድ ምን ያህል ቀይሮታል?

መርምር: ሀ. በአፋጣኝ ወደ ጤና ተቋም ለህክምና መሄድ

ለ. ጤና ተቋም በተደጋጋሚ መጎብኘት

ሐ. መድሃኒት በአግባቡ መውሰድ

19. በጤና መድሀን አባላት የሚፈጸሙ የጤና መድሀኑን ሊጎዱ የሚችሉ ተግባራት አሉ? ካሉ ምን ምን ናቸው?

መርምር: ሀ. የሌላ ሰው መታወቂያ ካርድ ይዞ ለመታከም መሞከር

ለ. ያልታደሰ መታወቂያ ካርድ ይዞ ለመታከም መሞከር

ሐ. አባል ላልሆነ ሰው መድሃኒት ለመውሰድ ወደ ጤና ተቋም መሄድ

መ. መድሃኒቶችን ወስዶ ለመሸጥ ወይም ለማክማቸት በማሰብ ወደ ጤና ተቋም መሄድ

ሠ. ሌሎች ተግባራት?

20. ከነዚህ ተግባራት መካከል በብዛት የሚስተዋሉት የትኞቹ ናቸው?

21. የጤና መድሀን አባላት በራሳቸው ምርጫ የተለየ መድሃኒት ወይም ላቦራቶሪ እንዲታዘዝላቸው ይጠይቃሉ? ለምን?

22. ከቅብብሎቹ ስርዓቱ ጋር ተያይዞ ምን ምን ችግሮች አሉ? ለቀላል የጤና ችግሮች ሪፈር እንዲላሉ የሚፈልጉ ታካሚዎች አሉ? ለምን? ፍላጎታቸው አልሳካ ሲል ምላሻቸው ምን ይመስላል?

23. እነዚህን ተግባራት ለመከላከል እየተወሰዱ ያሉ የመፍትሄ አቅጣጫዎች ምን ምን ናቸው? ቀጣይስ ምን መደረግ አለበት ይላሉ?

24. በጤና ባለሙያዎች የሚፈጸሙ የጤና መድሀኑን ሊጎዱ የሚችሉ ተግባራት አሉ? ካሉ ምን ምን ናቸው?

መርምር: ሀ. ውድ መድሃኒት እና ላቦራቶሪ ማዘዝ

ለ. ከሚያስፈልገው በላይ ማዘዝ

ሐ. አላስፈላጊ የሆነ ሪፈራል

መ. አባል ላልሆኑ ታካሚዎች በአባል ታካሚ ስም መድሃኒት እንዲያገኙ ማድረግ

ሠ. ሌሎች ተግባራት?

25. ከነዚህ ተግባራት መካከል በብዛት የሚስተዋሉት የትኞቹ ናቸው?

26. እነዚህን ተግባራት ለመከላከል እየተወሰዱ ያሉ የመፍትሄ አቅጣጫዎች ምን ምን ናቸው? ቀጣይስ ምን መደረግ አለበት ይላሉ?

27. የጤና መድሀኑ እነዚህን አላስፈላጊ የሆኑ የታካሚና የጤና ባለሙያ ባህሪያት/ተግባራት ከመቀነስ አኳያ ምን ያህል ስኬታማ ነው ይላሉ?

ማጠቃለያ

28. በአጠቃላይ የጤና መድሀኑ ጥሩ አፈፃፀም እና ዘላቂነት እንዳይኖረው የሚፈታተኑ ተግዳሮቶችና እንቅፋቶች ምን ምን ናቸው?

29. የማህበረሰብ አቀፍ ጤና መድሀንን በተመለከተ ብዙ ጉዳዮችን አንስተናል። እስካሁን በተወያየንባቸው ጉዳዮች ላይ የሚጨምሩት ሃሳብ ካለ?

ቃለመልሶችን ጨርሰናል ለነበረን ቆይታ በጣም እናመሰግናለን!

2B: In-Depth Interview Guide (የአማርኛ ቃለመጠይቅ መመሪያ)

ከማህበረሰብ አቀፍ ጤና መድሀን አባላት ከሆኑና ከነበሩ የማህበረሰብ ክፍሎች ጋር ለሚደረግ ውይይት

ክፍል 1: የጥናቱ ተሳታፊዎች ዳራ

1. ዕድሜ _____ 2. ፆታ _____
3. የጋብቻ ሁኔታ _____ 4. የትምህርት ደረጃ _____
5. የጤና መድሀን አባልነት ሁኔታ _____

ክፍል 2: ስለ ጤና አገልግሎት ጥራት አተያይ (objective II & III)

1. ብዙውን ጊዜ የቤተሰብ አባላቱ የጤና አገልግሎት የሚያገኘው ከየትኛው የጤና ተቋም ነው?
2. የቤተሰቡ አባላት ባለፉት ስድስት ወራት ለምን ያህል ጊዜ ለህክምና ወደ ጤና ተቋም ሄደው ነበር? በአንድ አመት ውስጥስ?
3. በርስዎ እይታ የጤና መድሀን አባላት በሚያገኙት የጤና አገልግሎት ምን ያህል ረክተዋል?
4. በጤና ተቋማት ስለሚሰጠው የጤና አገልግሎት ጥራት የርስዎ እይታ ምን ይመስላል?

መርምር: ከሚከተሉት መስፈርቶች አኳያ ቢብራራ

- ሀ. ወረፋና ቀልጣፋ አገልግሎት መስጠት? መርማሪ የጤና ባለሙያውን ለማግኘት?
 - ለ. በቂ የጤና ባለሙያ መኖር?
 - ሐ. የጤና ባለሙያዎች ብቃት?
 - መ. የጤና ባለሙያዎች የሥራ ተነሳሽነት, ስነምግባርና ለጤና መድሀን አባላት ያላቸው አመለካከት?
 - ሠ. የምርመራ መሳሪያዎችና አቅርቦት?
 - ረ. የአስፈላጊ መድሃኒቶች መገኘት?
 - ሰ. በቂ የታካሚዎች ማረፊያ ክፍል መኖር?
 - ሸ. የጤና ተቋሙ ዕዳትና ውበት?
 - ቀ. የቅብብሎሽ ሥራዓቱ?
5. በጤና ተቋማት የጤና መድሀን አባላት አባል ካልሆኑ ተገልጋዮች ጋር ተመሳሳይ የጤና አገልግሎት ያገኛሉ? ማዳላት ካለ ልዩነቱ ምንድን ነው? ማንኛው የተሻለ ተጠቃሚ ነው?

መርምር: ሀ. ወረፋ?

- ለ. ባመጣጥ ቅደምተከተል ማስተናገድ?
 - ሐ. በአክብሮት እና በትህትና ማስተናገድ?
 - መ. ታካሚውን በዕጥና ማዳመጥ?
 - ሠ. ለምርመራ በቂ ሰዓት መስጠት?
 - ረ. አካላዊ ምርመራ ማድረግ?
 - ሰ. አስፈላጊውን ላቦራቶሪ ማዘዝ?
 - ሸ. የሚታዘዘው መድሃኒት ጥራት?
6. የድጋፍ ሰጭ ሰራተኞች ሰው ወዳድና ታካሚዎችን ለመርዳት ያላቸው ዝግጁነት ምን ይመስላል?
 7. ከጤና አገልግሎት ጥራት አኳያ ምን ምን ችግሮች አሉ? እርስዎ ወይም ሌሎች ያጋጠማቸውን ችግር ቢገልፁልን?

ክፍል 3: ስለ ጤና መድሀኒት አተያይ (objective III)

8. የጤና መድሀኒት አባል የሆኑት መቼ ነው? ለምን ያህል አመት በአባልነት ቆዩ?
9. ማህበረሰቡ ለጤና መድሀኒት አባልነት ለመመዘገብ ያለው ፍላጎት ምን ይመስላል? አባል ለመሆን የማይፈልጉት ለምንድን ነው?
10. የጤና መድሀኒት አባላት አባልነታቸውን ለማደስ ያላቸው ፍላጎት ምን ይመስላል? ለምን ያቋርጧል? (ላቋረጡ - እርስዎ ለምን ማደስ አልፈሉም)
11. የጤና መድሀኒት አባል ለመሆን ያነሳሳዎት ምን ነበር? አባል እንዲሆኑ ያግባባዎት ወይም ያበረታታዎት ሰው ነበር? ያስገደደዎት አካልስ ነበር?
12. ማህበረሰቡ ለጤና መድሀኒት አባልነት ያለፍላጎቱ ተገዶ እንዲመዘገብ ወይም አባልነቱን እንዲያደስ የሚደረግበት ሁኔታ አለ? ካለ በምን መልኩ?
13. ምን አይነት የቤተሰብ አባላት ናቸው በብዛት የማህበረሰብ አቀፍ ጤና መድሀኒት አባል መሆን የሚፈልጉት? ለምን? መርምር: ጎጂ ምርጫ (adverse selection) እና ስለመከላከያው
14. ምን አይነት የቤተሰብ አባላት ናቸው በብዛት የጤና መድሀኒት አባልነታቸውን የሚያደሱት? ለምን? > መርምር: ጎጂ ምርጫ (adverse selection)
15. የማህበረሰብ አቀፍ ጤና መድሀኒት አባልነታቸውን ካቋረጡ በኋላ እንደገና የሚመዘገቡ አባላት በብዛት አሉ? በብዛት ምን አይነት የቤተሰብ አባላት ናቸው ካቋረጡ በኋላ እንደገና የሚመዘገቡት? ለምን? > መርምር: ጎጂ ምርጫ (adverse selection) ወይስ የማህበረሰብ ቅስቀሳ መጠናከር
16. የጤና መድሀኒት አባላት አመታዊ መዋጮ ከማህበረሰቡ የመክፈል አቅም አንጻር እንዴት ያዩታል?
17. የጤና መድሀኒት አባል በመሆንዎ ያገኛቸው ዋና ዋና ጥቅሞች ምን ምን ናቸው? ሌሎች አባላትስ ምን ምን ጥቅሞችን ያገኛሉ?
18. የጤና መድሀኒት ታካሚዎች በህክምና ሰዓት ከኪስ አውጥተው ክፍያ እንዳይከፍሉ ጠብቋቸዋል ይላሉ? ታካሚዎች አገልግሎቱ ባለመኖሩ ወይም መክፈል ባለመቻላቸው ምክንያት ህክምና ሳያገኙ የሚመለሱበት አጋጣሚ አለ? የርስዎ ቤተሰብስ? በምሳሌ ቢብራራ
19. የጤና መድሀኒት ድንገተኛ የጤና ችግር ሲያጋጥም ከአቅም በላይ የሆነና ያልታሰበ የህክምና ወጭን ለመከላከል ያስችላል ብለው ያስባሉ?
20. ለታካሚዎች የሚፈጸመው የኪስ የትክ ክፍያ አሰራር እንዴት ያዩታል?
21. እርስዎ የትክ ክፍያ ጥያቄ አቅርበው ክፍያ ተከልክለው ያውቃሉ? መርምር: ሀ. ለምን ያህል ጊዜ? ለ. ምክንያቶቹ ምን ምን ናቸው? ሐ. ምን ተሰማዎት?
22. የትክ ክፍያን መክልከል ምን ያህል የተለመደ ነው? ለክፍያ መክልከል ምክንያቶቹ ምን ምን ናቸው? መርምር: የሰዎች ስሜት ምን ይመስላል? አባላት ክፍያ ሲከፈሉ ውሳኔያቸው ምንድን ነው?
23. የጤና መድሀኒት ተቋሙ በሚሰጠው አገልግሎት ምን ያህል ረክተዋል? መርምር: ሀ. የአባልነት መታወቂያ በቀላሉ ማግኘት ለ. ፈጣን አገልግሎት ሐ. መዋጮ ሲሰበሰብ

- 24. ባጠቃላይ ማህበረሰቡ ስለጤና መድሀን የሚጠላው ነገር ምንድን ነው?
- 25. ባጠቃላይ ማህበረሰቡ ስለጤና መድሀን የሚወደው ነገር ምንድን ነው?
- 26. የጤና መድሀኑን ለማሻሻል ምን መደረግ አለበት ይላሉ?

ክፍል 4: የሞራል አደጋ (Moral hazard)

- 27. የማህበረሰብ አቀፍ የጤና መድሀን መጀመር የማህበረሰቡን ወደ ጤና ተቋም የመሄድ ልምድ ምን ያህል ቀይሮታል?
 መርምር: ሀ. በአፋጣኝ ወደ ጤና ተቋም ለህክምና መሄድ
 ለ. ጤና ተቋም በተደጋጋሚ መጎብኘት
 ሐ. መድሃኒት በአግባቡ መውሰድ
- 28. የጤና መድሀን አባል በሆኑና ባልሆኑ ታካሚዎች መካከል የስነምግባር ልዩነት አለ? ካለ ቢብራራ
- 29. የጤና መድሀን አባላት በራሳቸው ምርጫ የተለየ መድሃኒት ወይም ላቦራቶሪ እንዲታዘዝላቸው ይጠይቃሉ? ለምን?
- 30. ከቅብብሎሽ ስርዓቱ ጋር ተያይዞ ምን ምን ችግሮች አሉ? ለቀላል የጤና ችግሮች ሪፈር እንዲባሉ የሚፈልጉ ታካሚዎች አሉ? ለምን? ፍላጎታቸው አልሳካ ሲል ምላሻቸው ምን ይመስላል?
- 31. የጤና መድሀን ከተጀመረ ወዲህ የማህበረሰቡ ለህክምና ወደ ጤና ተቋም የመሄድ ባህሉ ተቀይሯል? በምን መልኩ? ለምን?
- 32. የተወሰኑ የጤና መድሀን አባላት አባል ላልሆኑ ዘመዶቻቸው ወይም ጓደኞቻቸው መድሃኒት ለማወጣት ወደ ጤና ተቋም ይሄዳሉ። ይህ ተግባር ምን ያህል የተለመደ ነው? ተክክል ነው ብለው ያስባሉ?
- 33. የተወሰኑ የጤና መድሀን አባላት አባል ላልሆኑ ዘመዶቻቸው ወይም ጓደኞቻቸው ወደ ጤና ተቋም ሄደው እንዲታከሙበት የአባልነት መታወቂያ ካርዳቸውን ይሰጧቸዋል። ይህ ተግባር ምን ያህል የተለመደ ነው? ተክክል ነው ብለው ያስባሉ?
- 34. የጤና መድሀን አባል ሆነው ከቤተሰቡ አባላት አንድም ሰው ሳይታመም አሙቱ እየተገባደደ ቢመጣ የአባልነት ጊዜው ከማለቁ በፊት ህመም ባይሰማዎ እንኳ ወደ ጤና ተቋም ይሄዳሉ? ለምን? መዋጮ ከፍለው ሳይታከሙ በመቅረትም ምን ይሰማዎታል?
- 35. ከላይ ያነሳናቸው አይነት ወይም ሌሎች ተግባራት አጋጥሞዎት ያውቃሉ? ምን ያህል የተለመዱ ናቸው?
- 36. የረጅም ጊዜ የጤና እክል ያለባቸው አባላት በተደጋጋሚ ስለሚታከሙ ከጤነኞቹ የበለጠ መዋጮ መክፈል አለባቸው ብለው ያስባሉ?
- 37. የማህበረሰብ አቀፍ ጤና መድሀን አባላት መዋጮ በሚያገኙት የጤና አገልግሎት መጠን ልክ መሆን አለበት ብለው ያስባሉ?

ማጠቃለያ: የማህበረሰብ አቀፍ ጤና መድሀንን በተመለከተ ብዙ ጉዳዮችን አንስተናል። እስካሁን በተወያየንባቸው ጉዳዮች ላይ የሚጨምሩት ሃሳብ ካለ?

ቃለምልልሱን ጨርሰናል ለነበረን ቆይታ በጣም እናመሰግናለን!

Annex 4: Document review checklist

	Year									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Membership development										
Estimated target population										
Number of insured										
Number of active policies										
Number of renewed policies										
Number of potential renewals										
Operating income										
Premium										
Registration fee										
Other operating income										
Membership fees										
Targeted subsidy										
General subsidy										
Expenses										
Incurred claims										
Pocket money										
Operating expenses										
Receipt printing										
Premium collectors (2%)										
Other expenses										

Annex 5: Participant information sheet

This is participant information for a research project entitled “Sustainability of community-based health insurance scheme and underlying challenges in two districts of northeast Ethiopia”, which is undertaken by Mr. Mohammed Hussien who is pursuing a doctoral degree in Public Health at Bahir Dar University, School of Public Health. The main purpose of the study is to understand the sustainability of a CBHI scheme and its challenges.

To meet this objective, it was deemed necessary to get responses from scheme members and key stakeholders who participate in the implementation of the scheme. You have been selected as a study participant to provide meaningful information and opinion on this subject. Your responses would be treated as confidential and will be used only for this study. In our analysis, any reference to the information that you provide will be made without mentioning or implicating your name in any way.

Participation in this study does not have any physical harm, social discrimination, psychological trauma, or economic loss. There is no inducement, incentives, or compensation that is given to you while you participate in this study. Participation is entirely based on your willingness and interest. You have the right to refuse the interview or withdraw from the interview at any time. You have also the right not to answer some of the questions that you do not want to respond to. No one will impose you to explain the reason for refusal or withdrawal. However, your honest answers and opinions on the questions related to the aforementioned issues will help to learn about the performance of the scheme and its challenges and formulate interventions tailored to make the scheme function more effectively. Hence, we would greatly appreciate your help and participation in this study.

You have the right to ask for information that is not clear about the research context and content before or during the research work. You can contact the principal investigator, the supervisor, or Bahir Dar University, College of Medicine and Health Sciences, Institutional Review Board (IRB) Office using their contact addresses.

Bahir Dar University, College of Medicine and Health Sciences, IRB Office Tel. +251588209834

Principal Investigator’s Name: Mohammed Hussien, Tel: +251 920272128

Supervisor’s Name: Dr. Muluken Azage Tel +251 911364097

ለጥናቱ ተሳታፊዎች የሚቀርብ መረጃ

ጤና ይስጥልን። ይህ “የማህበረሰብ አቀፍ ጤና መድሀኒት ዘላቂነትና ተግዳሮቶቹ” በሚል ርዕስ አቶ ሙሐመድ ሁሴን በባህር ዳር ዩኒቨርሲቲ በህብረተሰብ ጤና የድህረ ምረቃ ድግሪያቸውን ለማሟላት ለሚያካሂዱት ጥናት ለጥናቱ ተሳታፊዎች የቀረበ መረጃ ነው። የጥናቱ ዋና አላማም የማህበረሰብ አቀፍ ጤና መድሀኒት ዘላቂነትን ለመገምገምና ተግዳሮቶቹ ምን ምን ናቸው የሚለውን ለመረዳት ነው።

የጥናቱን አላማ ለማሳካት ከጤና መድሀኒት አባላትና በጤና መድሀኒት ትግበራ ላይ ከሚሳተፉ የተለያዩ ባለድርሻ አካላት መረጃ መሰብሰብ ነው። በመሆኑም እርስዎ ለጥናቱ አስፈላጊውን መረጃና አስተያየት እንዲሰጡ ተመርጠዋል። የሚሰጡት መረጃ ሁሉ ሚስጥራዊነቱ የተጠበቀና ለጥናቱ አላማ ብቻ የሚውል ይሆናል። የጥናቱ ውጤት በሚተነተንበት ጊዜ የሚሰጡን መረጃ የርስዎን ማንነት ወይም ስም በማይገልፅን በማያሳውቅ መልኩ ነው።

በዚህ ጥናት መሳተፍ ምንም አይነት አካላዊ ጉዳት ማህበራዊ መገለል፣ የስነ - ልቦና ጉዳት ወይም ኢኮኖሚያዊ ጉድለት አያስከትልም። በዚህ ጥናት ሲሳተፉ ምንም አይነት ማነቃቂያ ማበረታቻ ወይም ማካካሻ አይኖርም። የጥናቱ ተሳትፎ በርስዎ ፈቃደኝነትና ፈላጊነት ላይ የተመሰረተ ነው። በጥናቱ ያለመሳተፍ፣ መስጠት የማይፈልጉትን መረጃ ከመስጠት መቆጠብ፣ የተወሰኑ ጥያቄዎችን ያለመመለስ ወይም ቃለ ምልልሱን በማንኛውም ሰዓት የማቋረጥ መብትዎ የተጠበቀ ነው። ቃለ ምልልሱን በማንኛውም ሰዓት ቢያቋርጡ ለምን እንዳቋረጡ ማብራሪያ እንዲሰጡ የሚያስገድድዎ አካል አይኖርም። ይሁንና ለምናነሳቸው ጥያቄዎች የሚሰጡት ቀና ምላሽና አስተያየት፣ ስለ ማህበረሰብ አቀፍ ጤና መድሀኒት አፈፃፀም እና ተያያዥ ችግሮች ለማወቅ እንዲሁም ለወደፊት በጥናቱ ግኝት መሰረት ጤና መድሀኒት የተሻለ ውጤታማ እንዲሆን የሚያስችሉ መፍትሄዎችን ለማስቀመጥ ወሳኝ ድርሻ አለው። በመሆኑም ለትብብርዎና ተሳትፎዎ ከፍተኛ ያለ አድናቆት አለን።

ስለ ጥናቱ ይዘት ግልፅ ያልሆነልዎ ነገር ካለ ከቃለ-ምልልሱ በፊትም ሆነ በቃለ-ምልልሱ ወቅት ጥያቄ የመጠየቅና ለተጨማሪ መረጃ ዋና ተመራማሪውን ተቆጣጣሪውን ወይም ባህር ዳር ዩኒቨርሲቲ ህክምናና ጤና ሳይንስ ኮሌጅ የተቋማዊ ጥናትና ስነ-ምግባር ቦርድን በሚከተሉት አድራሻዎች ደውለው ማግኘት ይችላሉ።

ባህር ዳር ዩኒቨርሲቲ ህክምናና ጤና ሳይንስ ኮሌጅ የተቋማዊ ጥናትና ስነ-ምግባር ቢሮ ስልክ: +251588209834

የዋና ተመራማሪ ስም: ሙሐመድ ሁሴን ስልክ: +251 920272128

የተቆጣጣሪ ስም: ዶ/ር ሙሉቀን አዛገ ስልክ: +251 911364097

Annex 6: Informed consent form

Title of the project: Sustainability of community-based health insurance scheme and underlying challenges in two districts of northeast Ethiopia

I have been well aware that this research undertaking is a postgraduate degree partial fulfillment of the research thesis, which is fully supported and coordinated by Bahir Dar University School of Public Health, and the designated principal investigator is Mohammed Hussien. I have been fully informed in the language I understand about the research project objectives which are to understand the sustainability of a CBHI scheme and its challenges.

I have been informed that all the information I shall provide to the interviewer will be kept confidential. I understood that the research has no risk. I also knew that I have the right to withhold information, skip questions to answer, or withdraw from the study at any time. I have acquainted that nobody will impose me to explain the reason for withdrawal.

I have assured that the right to ask for information that is not clear about the research before and or during the research work and to contact Bahir Dar University, College of Medicine and Health Sciences IRB Office Tel. +251588209834

Principal Investigator's Name: Mohammed Hussien, Tel: +251 920272128

Supervisor's Name: Dr. Muluken Azage Tel +251 911364097

I have read this form, or it has been read to me in the language I comprehend and understood the condition stated above. Therefore:

- I am willing and agreed to participate in the study (Proceed with the interview)
- I am not willing and agreed to participate in the study (Terminate the interview)

በመረጃ የተደገፈ የስምምነት ቅጽ

የጥናቱ ርዕስ: የማህበረሰብ አቀፍ ጤና መድሀን ዘላቂነትና ተግዳሮቶቹ

ይህ ጥናት በባህር ዳር ዩኒቨርሲቲ የህብረተሰብ ጤና ትምህርት ቤት አስተባባሪነት ለድህረ ምረቃ ዲግሪ ማሟያነት በአቶ ሙሐመድ ሁሴን አማካኝነት የሚካሄድ ምርምር እንደሆነ በሚገባ ተገንዝቤአለሁ። የጥናቱ አላማም የማህበረሰብ አቀፍ ጤና መድሀን ዘላቂነትን ለመገምገምና ተግዳሮቶቹ ምን ምን ናቸው የሚለውን ለመረዳት መሆኑን በሚገባኝ ቋንቋ በደንብ ግልፅ ተደርጎልኛል።

ለመረጃ ሰብሳቢው የምሰጠው ማንኛውም መረጃ ምስጢራዊነቱ የተጠበቀ እንደሚሆን ተነግሮኛል። በተጨማሪም መረጃ ከመስጠት መቆጠብ፣ የተወሰኑ ጥያቄዎችን ያለመመለስ ወይም ቃለ ምልልሱን በማንኛውም ሰዓት የማቋረጥ መብት እንዳለኝ ተረድቻለሁ። ቃለ ምልልሱን ለምን እንዳቋረጥኩ ማብራሪያ እንድሰጥ እንደማልገደድም ግልፅ ተደርጎልኛል።

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- በጥናቱ ለመሳተፍ ፈቅጄ ተስማምቻለሁ (ቃለምልልሱን ይቀጥሉ)
- በጥናቱ ለመሳተፍ አልተስማማሁም (አመስግነው ይለያዩ)

RESEARCH

Open Access



Continued adherence to community-based health insurance scheme in two districts of northeast Ethiopia: application of accelerated failure time shared frailty models

Mohammed Hussien^{1*} , Muluken Azage² and Negalign Berhanu Bayou³

Abstract

Background: The sustainability of a voluntary community-based health insurance scheme depends to a greater extent on its ability to retain members. In low- and middle-income countries, high rate of member dropout has been a great concern for such schemes. Although several studies have investigated the factors influencing dropout decisions, none of these looked into how long and why members adhere to the scheme. The purpose of this study was to determine the factors affecting time to drop out while accounting for the influence of cluster-level variables.

Methods: A community-based cross-sectional study was conducted among 1232 rural households who have ever been enrolled in two community-based health insurance schemes. Data were collected using an interviewer-administered questionnaire via a mobile data collection platform. The Kaplan–Meier estimates were used to compare the time to drop out among subgroups. To identify predictors of time to drop out, a multivariable analysis was done using the accelerated failure time shared frailty models. The degree of association was assessed using the acceleration factor (δ) and statistical significance was determined at 95% confidence interval.

Results: Results of the multivariable analysis revealed that marital status of the respondents ($\delta = 1.610$; 95% CI: 1.216, 2.130), household size ($\delta = 1.168$; 95% CI: 1.013, 1.346), presence of chronic illness ($\delta = 1.424$; 95% CI: 1.165, 1.740), hospitalization history ($\delta = 1.306$; 95% CI: 1.118, 1.527), higher perceived quality of care ($\delta = 1.322$; 95% CI: 1.100, 1.587), perceived risk protection ($\delta = 1.218$; 95% CI: 1.027, 1.444), and higher trust in the scheme ($\delta = 1.731$; 95% CI: 1.428, 2.098) were significant predictors of time to drop out. Contrary to the literature, wealth status did not show a significant correlation with the time to drop out.

Conclusions: The fact that larger households and those with chronic illness remained longer in the scheme is suggestive of adverse selection. It is needed to reconsider the premium level in line with household size to attract small size households. Resolving problems related to the quality of health care can be a cross-cutting area of intervention to retain members by building trust in the scheme and enhancing the risk protection ability of the schemes.

Keywords: Community-based health insurance, Membership adherence, Ethiopia

Introduction

Universal health coverage requires that everyone in a country has adequate access to essential health care without financial difficulty, regardless of living standards [1]. Moving to universal health coverage requires a strong

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health system with stable financing mechanisms [2]. A growing number of low and middle-income countries, including Ethiopia, are implementing voluntary community-based health insurance (CBHI) schemes as a risk-pooling mechanism for rural communities and informal sector workers [3, 4]. In most CBHI schemes, the issue of financial sustainability becomes a critical challenge to achieve the goal of universal health coverage [4, 5].

The sustainability of a voluntary CBHI scheme depends to a greater extent on its capacity to retain members. While initial uptake is important, continued membership adherence is vital to establish a stable insurance scheme that can generate adequate funding for health care [6]. The key indicators for measuring membership that determine the sustainability of voluntary insurance schemes are growth rate, coverage ratio, and renewal rate [6–9]. Growth rate measures how fast the number of insurance members is increasing or decreasing over time, while coverage ratio measures the proportion of the target population participating in the scheme [6, 7]. The renewal rate measures the proportion of insured that stay enrolled in the scheme after their coverage term expires. It is an indicator of scheme performance in retaining its members [7, 9]. High renewal rates indicate that members value services, find the premiums affordable, and are satisfied with the scheme benefits and health services, while low renewals reflect that the target population is not satisfied enough to maintain its membership [6, 7].

An increase in membership growth and renewal rates results in increased revenue, lower marginal cost, and lower health care costs as we can retain relatively healthy members [6, 7, 10]. In a voluntary health insurance scheme, a lower renewal rate leads to adverse selection, that is, healthy members drop out of the scheme while high-risk groups are more inclined to maintain their membership, leading to the existence of small pools with little risk redistribution capabilities [11]. This drives healthcare and administrative costs to higher than anticipated levels, which eventually hamper the financial sustainability of the scheme [10]. In such circumstances, health insurance schemes will fall short of improving access to health care and protecting members from financial hardship [12].

Apart from a few successful cases, CBHI initiatives face the issue of persistently low membership [4], which could be attributed to either an initial low enrollment or high dropout rate [6, 7]. Member dropout has been a great concern for CBHI schemes in low- and middle-income countries. Prior studies that have dealt with this issue reported a higher rate of dropout. For instance, in Bangladesh, a drop-out rate of 62% was reported [13], while in India a dropout rate of 63% was documented in 2013 for three CBHI schemes [14]. In Ghana, the dropout rate

ranged between 34.8% in 2012 [15] to 53% in 2016 [16]. Recent work in Uganda estimated that 25.1% of households that had ever enrolled in voluntary CBHI reported dropping out [17]. Although a dropout rate of only 18% was reported one year after the initiation of CBHI in piloted districts of Ethiopia [18], later studies revealed higher figures. Among households that had ever enrolled in the scheme, 31.9% [19] and 37.3% [20] were dropouts. It could be argued that the higher renewal rate during the pilot phase of the scheme was due to a campaign effect following a coordinated effort by the government and non-governmental organizations to enhance its acceptability by the community [18].

It is imperative to generate a comprehensive set of empirical evidence on the factors that influence continued membership adherence to CBHI schemes. Even though several studies have been carried out on the factors influencing dropout decisions [13, 14, 16, 18, 21–26], none of these looked into the ability of the schemes to retain members in the long term, that is, how long members adhere to the scheme and the factors associated with the time to drop out. Moreover, earlier studies have ignored the effect of cluster-level variables on dropout decisions. Therefore, considering the hierarchical nature of the data, this study attempted to identify the factors influencing the time to drop out of a CBHI scheme using a shared frailty survival model.

Ethiopia's current health care financing strategy aims to gradually establish a unified national risk pool system to allow cross-subsidy between high-risk and low-risk areas [27]. The results of this study will be an essential input for policymakers to devise membership retention strategies in an attempt to establish higher-level pools at various levels of administration.

Design of the CBHI scheme in Ethiopia

The CBHI scheme is run by the government with community involvement in its design, management, and supervision. Enrollment is voluntary and membership needs to be renewed annually with the willingness of the members. To minimize adverse selection, the unit of enrollment is at the household level [28, 29].

At the time of the pilot phase, premiums ranged between \$7.31 to \$10.45 per year per household across regions. Regions have the freedom to modify the premium based on the local context [28, 29]. For example, in the Amhara National Regional State where this study was conducted, the initial annual premium of \$8.36 was later revised to different levels of contributions that vary based on household sizes. In the rural setups, the annual premiums range between \$8.54 to \$12 [30].

To enhance the affordability of health care, a general subsidy is provided to the scheme by the federal

government that constitutes 25% of overall enrollment contributions per year. A targeted subsidy from the regional and district governments is also provided to cover the costs of fee waiver to 10% of the population who are indigent groups. The CBHI benefit package covers all outpatient and inpatient services at the health center and hospital level except for treatment abroad, procedures with large cosmetic values such as tooth implantation, eyeglasses, and plastic surgery; organ transplantation; chronic renal dialysis and treatment for non-generic medicines [28, 29].

Methods

Study setting

The study was conducted in the rural parts of two neighboring districts in northeast Ethiopia, Tehulederie and Kalu. Tehulederie is divided into 20 rural and 7 urban *kebeles* (subdistricts) with an estimated total population of 145,625 of which 87.5% are residing in the rural area. In the district, there are five health centers and one primary hospital. Tehulederie was one of the 13 districts in Ethiopia, where the CBHI scheme was piloted in 2011. After two years of implementation of the pilot project, enrollment in the scheme reached 91% [28]. However, membership coverage had declined to 60% among 22,678 eligible households as of April 2020 [31].

Based on lessons learned from the evaluation findings of the CBHI pilot project in the country, a decision was made to design and implement a national scale-up of the initiative to 161 districts in July 2013 including Kalu district [28]. Kalu is divided into 36 rural and 4 urban *kebeles* and has nine health centers that provide health care to the surrounding area. It is the most populous district in the zone, which has an estimated total population of 234,624 among which 89.11% are living in the rural part. Among 46,924 eligible households in the district, 61% were covered by CBHI after seven years of implementation in 2020 [31].

Study design and population

A community-based cross-sectional study was conducted using face-to-face interviews to collect quantitative data among rural households who had ever been enrolled in CBHI before January 2020. The study focused on rural *kebeles* because the scheme in urban *kebeles* had a unique design, and was started recently which makes it too early to evaluate its sustainability. Non-paying scheme members were excluded from the study since such members have no incentive to drop out of the scheme, the inclusion of which could have a confounding effect on the association between economic status and time to drop out. Because CBHI membership was at the household

level, data were collected and analyzed at the household level.

Study variables and measurement

The outcome variable was time to drop out of a CBHI membership starting from the point at which the households joined the scheme and was measured in years. The event of interest was dropping out of CBHI membership, hence households that dropped out were coded as “1” and otherwise “0”.

The independent variables for this study were selected based on the findings of a systematic review. We did a systematic review of the factors that influence CBHI membership renewal in low- and middle-income countries before starting this study [32]. Search strategies for electronic databases were developed in line with the PRISMA guidelines [33] for systematic reviews and a search was conducted from Dec. 2019 – Feb. 2020, using PubMed, Scopus, and Hinari electronic databases. The reference lists of relevant systematic reviews and the studies included in the review were checked for additional papers. The details are available at <https://doi.org/10.2147/CEOR.S306855>.

The results of the systematic review revealed that age [22, 25, 34–36], gender [16, 21, 36], level of education [13, 14, 22–24], and marital status [21, 22] of the household head; household size [22, 35]; wealth status [13, 14, 22, 26, 34]; place of residence [23, 24, 26]; distance to the nearest health facility [13, 25, 34]; participation in a safety net program [18]; self-rated health status [21, 22]; recent episodes of illness [18, 25]; presence of chronic illness in the household [18, 24, 26]; history of hospitalization [14]; use of health care under the scheme [18, 24, 36]; frequency of health facility visit [13, 36]; benefit claims experience [13, 14]; perceived quality of health care [23–25]; value towards solidarity [25]; perceived risk protection [21] and trust in the scheme [25, 37] were important factors influencing the renewal decision of CBHI members.

With a few exceptions, we included all of the above variables in this study. Because the whole population of interest lives in a rural setting, place of residence was not taken into account in this study. Distance to a health facility is an important variable linked to renewal decisions. However, it was omitted in our case since it was considered as a *kebele* level variable that might be handled by the frailty analysis as unobserved characteristics (assuming people in the same *kebele* are located nearly at the same distance to the health facility). We did not include recent illness episodes as a predictor variable since we believed it could not impact previous dropout decisions.

During the pretest, we attempted to gather data on the frequency of health facility visits, usage of health

care under the scheme, and benefit claims experience, but we were unable to get meaningful data due to recall bias. Furthermore, we sought to obtain the yearly average health facility visits and benefit claims from the membership registration files of the schemes. We also failed to obtain the necessary data in this area owing to incomplete recording. As a result, we decided to omit these factors from the study.

Wealth index was generated using the principal component analysis method. The scores for 15 types of assets and utilities were translated into latent factors and a wealth index was calculated based on the first factor that explained most of the variation. Based on the index the study households were categorized into wealth tertile – lower, medium, and higher wealth tertile. Participation in a safety net program refers to being covered by a program catering to food-insecure households.

Self-rated health status was measured based on a household head's subjective assessment of the health status of the household and was rated as “excellent, very good, good, fair, or poor”. However, for analysis purposes, it was recategorized into fair, good, and very-good, by merging the two extreme response categories with few frequencies to the next categories. The presence of chronic illness refers to one or more members of the household having a known chronic illness that require ongoing medical attention and being informed by a health care provider. History of hospitalization was measured by asking the respondents whether or not any member of the household had received inpatient service after joining the scheme.

Value towards solidarity, perceived risk protection, and trust in the scheme are composite variables that were measured on a Likert scale using a 5—point response format with 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree by asking respondents to rate the extent to which they agreed on a set of items designed for each variable. To measure value towards solidarity, a three-item tool was adapted from a previous study conducted in Senegal [38], while a four-item trust measurement scale was adapted based on a previous tool validated and used in Cambodia [37]. Perceived risk protection is the perception of insurance members towards the ability of the CBHI scheme to protect subscribers from financial risks. It was measured using three items, which include the scheme being able to protect members from out-of-pocket expenditure, from selling their important assets, or borrowing money at the time of receiving health care. An overall index was calculated from a set of items using factor analysis, and a three-level categorical variable labeled as “low, medium, and high” was created for each of the three variables.

Perceived quality of health care was measured on a Likert scale using a 5—point response format with 1=strongly disagree to 5=strongly agree by asking respondents to rate the extent to which they agreed on a set of nine experience questions regarding the health services they received from the nearby health centers contracted by the CBHI scheme. The scores for the nine items were translated into three dimensions, and an overall health care quality index was created based on the first dimension that explained most of the variation. Finally, the health care quality index was categorized into low, medium, and high.

Sample size and sampling procedure

The sample size was calculated using MedCalc sample size calculator software version 20 via the log-rank test which compares survival rates of two independent groups. Due to the absence of previous studies on CBHI that could be used as an input for sample size calculation in survival analysis, a survival rate of 0.50, which yields an adequate sample size was assumed for the unexposed group. The survival rate in the exposed group was set to be 0.60 to achieve a power that could detect at least a 10% difference in survival rates between the two groups. This yields an effect size of 0.2037, which is the smallest recommended effect size for calculating an adequate sample size [39]. Hence, it was assumed that there is a binary variable that divides the sample population into two equal groups with survival rates of 0.50 in the unexposed group and 0.60 in the exposed group, 80% statistical power, and 95% confidence level [39]. Based on these assumptions, a sample size of 762 was calculated. Considering a design effect of 1.5 attributed to the use of a multi-stage sampling and a potential non-response rate of 10%, the effective sample size was estimated to be 1257 households.

The study participants were recruited using a three-level multistage sampling method. First, 12 clusters of *kebeles* organized under a health center catchment area were selected. Then, 14 rural *kebeles* were drawn randomly using a lottery method proportional to the number of *kebeles* under each cluster. Accordingly, five *kebeles* from Tehulederie and nine from Kalu were included. A list of households who have ever been enrolled in the CBHI scheme was obtained from the membership registration books of each *kebele* and these lists were used as the sampling frame. Then, 1257 households were drawn randomly using a random number generator software from the selected *kebeles* proportional to the total number of households ever enrolled in the scheme.

Data collection process

Household-level data were collected from 04 February to 21 March 2021 using a structured

interviewer-administered questionnaire by trained data collectors. Information related to membership duration and status of the households was obtained from the membership registration book at each *kebele* (health post), which provides data related to the annual renewal status since the initiation of the scheme. Ten years of follow-up data were obtained starting from the initiation of the CBHI scheme in 2011 to the 2021 registration period, after which renewal data were not available. Information related to socio-demographic characteristics of the household, health status, health care utilization, value towards solidarity, perceived risk protection, trust in the scheme, and perception of respondents towards health care quality were collected at the household level through face-to-face interviews. The heads of the households were interviewed at their home or workplace using the local language, Amharic. The data collectors were guided by health extension workers to track the sampled households. Health extension workers provide home-based health services in rural *kebeles* and are well aware of the addresses of each household. A mobile data collection platform, Open Data Kit (ODK) was applied to the household survey. The data collectors submitted the completed forms to the ODK aggregator (Kobo) server daily, which helped us to review the daily submissions and facilitate the supervision process.

Before the data collection, the questionnaire was pre-tested on a sample of 84 randomly selected participants in one *kebele*. As part of the pre-test, a cognitive interview was conducted on selected items using the verbal probe technique among eight respondents to determine whether or not items and response categories were understood and interpreted by the potential respondents as intended. Accordingly, the wording of some items and response options were modified and some items were removed.

Data processing and analysis

The data were analyzed using Stata version 17.0. Exploratory factor analysis was performed to assess the validity of the questionnaires designed to measure value towards solidarity, perceived risk protection, trust in the scheme, and perceived quality of health care. The Bartlett's test of Sphericity and the Kaiser-Meyer-Olkin's (KMO) measure of sampling adequacy tests were performed to assess the appropriateness of the data for factor analysis. Items with insignificant loadings (loading below 0.40) and items with a cross-loading were removed from the analysis. The Eigenvalue greater than one decision rule was used to determine the appropriate number of factors to be extracted. The reliability of measurement scales was estimated

by measuring the internal consistency of each of the dimensions using Cronbach's alpha, with an acceptable alpha value of 0.60 or higher [40].

The total membership-years of follow-up with an average follow-up time and the annual dropout rate were computed. The time to drop out of a CBHI membership was described using the Kaplan–Meier estimate. To investigate the effect of variables on the time to drop out of CBHI members, a univariate analysis was performed by fitting separate models for each variable before proceeding to the multivariate analysis. Variables that were significant in the univariate analysis at a p-value of less than 0.20 [41] were included in the multivariable analysis. A multivariable analysis was done using the accelerated failure time shared frailty models to identify the predictors of time to drop out.

The classical Cox proportional hazard model, which is commonly used to analyze survival data, assumes that the ratio of the hazards between any two individuals is constant over time. However, in many applications, the study population cannot be considered homogeneous. In this study, the time to drop out of a CBHI membership is assumed to be different between clusters (*kebeles*) due to variations in the performance of the *kebele* health insurance committee which is mainly responsible for retaining scheme members. The intra-cluster correlation is assumed to be due to unobservable covariates specific to the cluster. One approach to account for such unobserved heterogeneity is the use of a shared frailty model which introduces a random effect into the model that induces dependence within clusters. In a shared frailty model, individuals in a cluster are assumed to share the same frailty value [42].

Frailty is an unobservable random effect shared by subjects within a cluster. It acts multiplicatively on the hazard function assumed to follow some distribution. When a shared frailty term with a Weibull distribution is assumed, the hazard function at time t for the j^{th} individual, $j = 1, 2, \dots, n_i$, in the i^{th} group, $i = 1, 2, \dots, g$, is given by:

$$h_{ij}(t) = z_i \exp(\beta' x_{ij}) \rho t^{\rho-1}, \quad (1)$$

where x_{ij} is a vector of explanatory variables for the j^{th} individual in the i^{th} group, β is the vector of regression coefficients, $\rho t^{\rho-1}$ is the baseline hazard function, ρ a shape parameter and the z_i are frailty effects that are common for all n_i individuals within the i^{th} group [43].

The hazard function can also be written in the form:

$$h_{ij}(t) = \exp(\beta' x_{ij} + u_i) \rho t^{\rho-1}, \quad (2)$$

where $u_i = \log(z_i)$.

The corresponding survivor function for a Weibull model that incorporates a shared frailty component is:

$$S_{ij}(t) = \exp\{-\exp(\beta'x_{ij}+u_i)t^p\}, \tag{3}$$

The frailty is generally assumed to follow a gamma or inverse-Gaussian distribution with a mean equal to 1, and variance θ which is estimated from the data. The estimate for the variance parameter θ in a shared frailty model can be thought of as a measure of the degree of correlation, where $\theta > 0$ indicates the presence of heterogeneity. Large values of θ reflect a greater degree of heterogeneity among clusters and a stronger association within clusters [43].

An accelerated failure time (AFT) model is a parametric model that provides a useful alternative to the commonly used proportional hazards models in survival analysis owing to its ease of interpretation. In addition, the regression parameters in AFT models are robust towards omitted covariates unlike that of the proportional hazards models [44]. The AFT model is a general model for survival data in which explanatory variables measured on an individual are considered to act multiplicatively on the timescale. It allows researchers to measure the direct effect of predictor variables on survival time. In contrast to the proportional hazards model, the AFT model can best be interpreted in terms of the survival function [45]. The AFT model is defined by the relationship:

$$S_1(t) = S_0(t/\delta), \text{ for } t > 0, \tag{4}$$

where δ is a constant called the acceleration factor, which tells the researcher how the change in the value of the covariate changes the time scale relative to the baseline time scale. The acceleration factor is the ratio of the survival time corresponding to any fixed value of $S(t)$. In the regression framework, the acceleration factor δ can be parameterized as $\exp(\alpha)$, where α is the parameter to be estimated from the data. With this parameterization, the general form of the survivor function for the i^{th} individual in an AFT model is:

$$S_i(t) = S_0\{t/\exp(\alpha'x_i)\}, \tag{5}$$

In this version of the model, $\exp(\alpha'x_i)$ is the acceleration factor for the i^{th} individual.

The general parametric AFT model that incorporates a shared frailty component is of the form:

$$S_{ij}(t) = S_0\{t/\exp(\eta_{ij})\}, \tag{6}$$

where $\eta_{ij} = \alpha'x_{ij} + u_i$, and $\exp(\eta_{ij})$ is the acceleration factor for the j^{th} individual in the i^{th} group. This model can be expressed in log-linear form as:

$$\log T_{ij} = \mu + \alpha_1 x_{1ij} + \alpha_2 x_{2ij} + \dots + \alpha_p x_{pij} + u_i + \gamma \epsilon_{ij}, \tag{7}$$

where T_{ij} is the random variable associated with the survival time of the j^{th} individual in the i^{th} group, μ and

γ are intercept and scale parameters respectively and u_i 's are the cluster-specific random effects. The quantity ϵ_{ij} is a random variable used to model the deviation of the values of $\log T_{ij}$ from the linear part of the model, and ϵ_{ij} is assumed to have a particular parametric distribution [46]. In this formulation of the model, the α -parameters reflect the effect that each explanatory variable has on the survival times; positive values suggest that the survival time increases with increasing values of the explanatory variable and vice versa.

The common baseline distributions of the AFT models include exponential AFT, Weibull AFT, log-logistic AFT, and log-normal AFT distributions. Akaike's Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used for model comparison. The overall fit of the final AFT model was checked by using the Cox-Snell residuals plot. Finally, the variance of the random effect (θ), Kendall's Tau (τ), the regression coefficients, and the acceleration factor (δ) with 95% confidence interval were estimated.

Results

Baseline characteristics of the study population

A total of 1232 ever enrolled CBHI members participated in this study with a response rate of 98%. The average age of the study participants was 49.45 years (SD = 12.25), with slightly more than half (50.65%) being between the ages of 45 and 64, and 13.72% being 65 and older. Among the total household heads, 1064 (86.36%) were males, and 1132 (91.88%) were currently married. More than three-quarters of the study participants (78.90%) did not attend formal education, and a larger proportion of them (60.88%) had a household size of five and above.

As for the health status, nearly one-fourth of the households (23.70%) had one or more individuals with a known chronic illness, while 490 (39.77%) of the households had received inpatient service under the CBHI scheme. Moreover, a smaller proportion of the households (17.69%) rated their household health status as fair, while 566 (45.94%) and 448 (36.36%) of them rated it as good and very good respectively (Table 1).

Time to drop out of CBHI scheme among the study population

Among the 1232 study participants, 29.14% (95% CI: 26.61%, 31.77%) had dropped out of CBHI following their initial enrollment in the scheme with an incidence rate of 5.27 per 100 person-year (95% CI: 4.75, 5.84). A quarter of respondents (25.30%) from Kallu and more than one-third (35.31%) from Tehulederie had dropped out of the scheme. The total follow-up period was 6816 person-years of observation, with an average follow-up time of 5.53 years (95% CI: 5.38, 5.68).

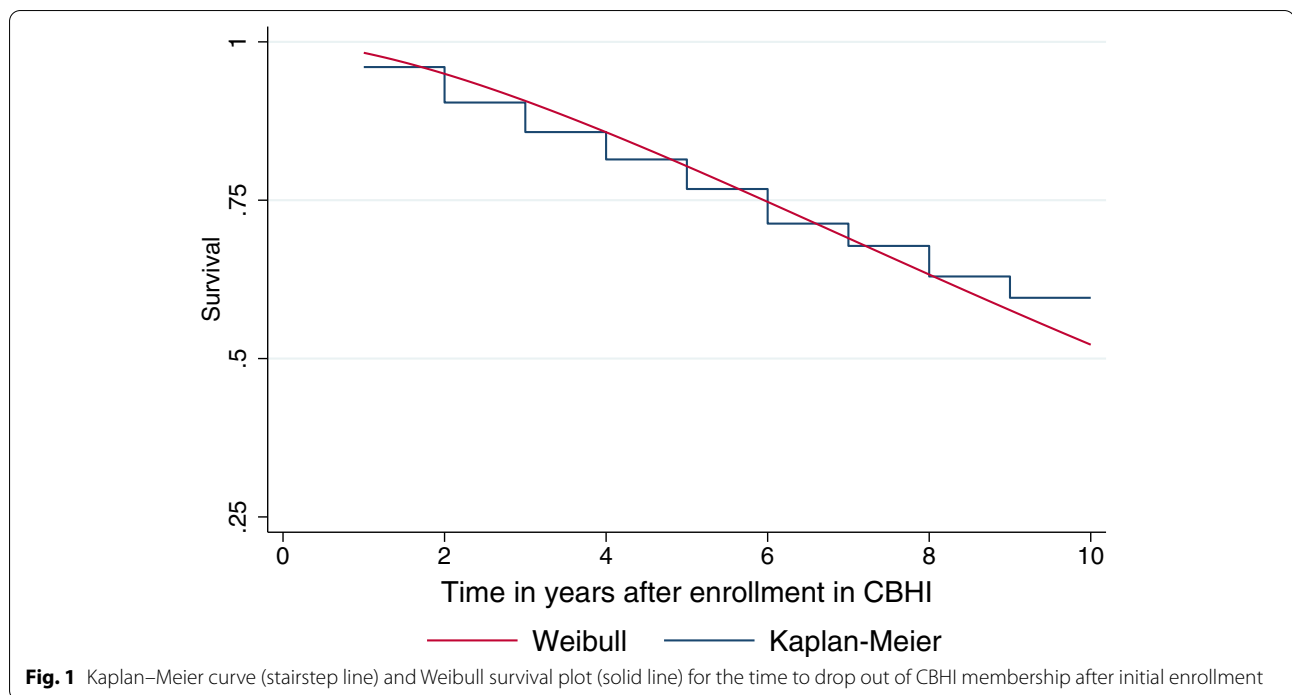
Table 1 Characteristics of households ever enrolled in a CBHI scheme in two districts of Northeast Ethiopia

Variables	Categories	Renewals /Censored, N(%)	Dropouts /Events, N(%)	Total N(%)
Age in years	25 – 44	319 (36.54)	120 (33.43)	439 (35.63)
	45 – 64	430 (49.26)	194 (54.04)	624 (50.65)
	65 +	124 (14.20)	45 (12.53)	169 (13.72)
Gender	Male	772 (88.43)	292 (81.34)	1,064 (86.36)
	Female	101 (11.57)	67 (18.66)	168 (13.64)
Marital status	Divorced or widowed	48 (5.50)	52 (14.48)	100 (8.12)
	Married	825 (94.50)	307 (85.52)	1,132 (91.88)
Educational status	No formal education	689 (78.92)	283 (78.83)	972 (78.90)
	Attend formal education	184 (21.08)	76 (21.17)	260 (21.10)
Household size	< Five	323 (37.00)	159 (44.29)	482 (39.12)
	≥ Five	550 (63.00)	200 (55.71)	750 (60.88)
Wealth tertile	Lowest	271 (31.04)	139 (38.72)	410 (33.28)
	Medium	294 (33.68)	117 (32.59)	411 (33.36)
	Highest	308 (35.28)	103 (28.69)	411 (33.36)
Participation in a Safety net program	No	743 (85.11)	318 (88.58)	1,061 (86.12)
	Yes	130 (14.89)	41 (11.42)	171 (13.88)
Self-rated health	Fair	159 (18.21)	59 (16.43)	218 (17.69)
	Good	408 (46.74)	158 (44.01)	566 (45.94)
	Very good	306 (35.05)	142 (39.55)	448 (36.36)
Chronic illness	No	642 (73.54)	298 (83.00)	940 (76.30)
	Yes	231 (26.46)	61 (17.00)	292 (23.70)
Hospitalization	No	488 (55.90)	254 (70.75)	742 (60.23)
	Yes	385 (44.10)	105 (29.25)	490 (39.77)
Perceived quality of health care	Low	283 (32.42)	133 (37.05)	416 (33.77)
	Medium	292 (33.45)	115 (32.03)	407 (33.04)
	Haigh	298 (34.14)	111 (30.92)	409 (33.20)
Value towards solidarity	Low	283 (32.42)	137 (38.16)	420 (34.09)
	Medium	382 (43.76)	140 (39.00)	522 (42.37)
	Haigh	208 (23.82)	82 (22.84)	290 (23.54)
Perceived risk protection	Low	256 (29.32)	157 (43.73)	413 (33.52)
	Medium	201 (23.02)	83 (23.12)	284 (23.05)
	Haigh	416 (47.65)	119 (33.15)	535 (43.43)
Trust in scheme	Low	245 (28.06)	159 (44.29)	404 (32.79)
	Medium	287 (32.88)	124 (34.54)	411 (33.36)
	Haigh	341 (39.06)	76 (21.17)	417 (33.85)
District	Tehulederie	306 (64.69)	167 (35.31)	473 (38.39)
	Kalu	567 (74.70)	192 (25.30)	759 (61.61)
	Total	873 (70.86)	359 (29.14)	1,232 (100)

Kaplan–Meier estimates were used to plot the survival function for the time to drop out of CBHI. As shown in Fig. 1, the probability of remaining in the scheme beyond 10 years was 59.6%. The median survival time was not reached, because more than 50% of the study participants remained in the scheme beyond the follow-up time.

To describe how the time to drop out of CBHI was distributed by different variables, Kaplan–Meier curves were plotted for selected variables that were significant

at p -value < 0.05 based on the log-rank test (Fig. 3). For the first 10 months after initial enrollment, the survival curves for respondents who were male, and married were consistently above those who were female and divorced or widowed. There exists also a clear difference in the survival curve of households having a chronic illness and those who had received inpatient service under CBHI compared to their reference groups, both of which prolonged the time to drop out. Similarly, the survival curves



for respondents who had a high-level perception on the quality of health care and the risk protection ability of the scheme, and who had high-level trust in the scheme were above their counterparts.

Model selection

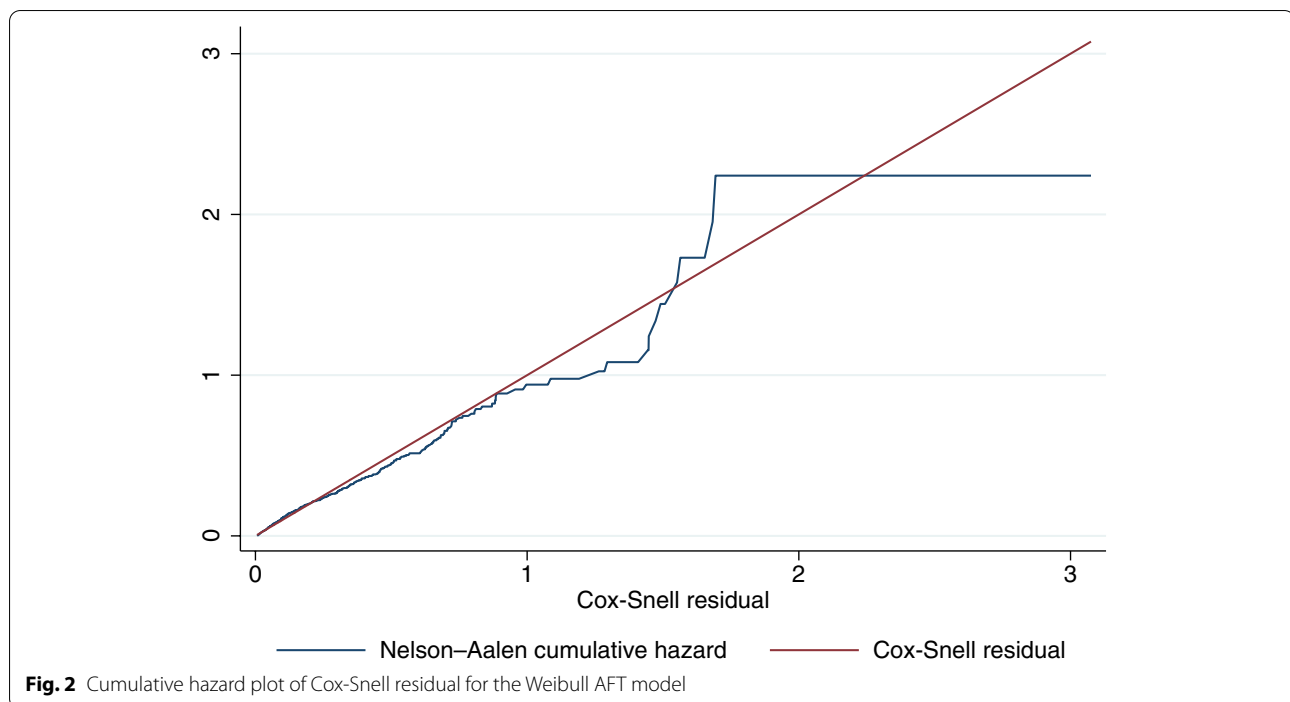
Multivariable AFT models of exponential, Weibull, log-normal, and loglogistic baseline hazard functions were fitted by considering both the gamma and inverse-Gaussian frailty distributions. The Weibull AFT inverse-Gaussian shared frailty model, which had a minimum AIC and BIC values was the preferred model to analyze the data. The AIC and BIC values of the different parametric AFT

models with gamma and inverse-Gaussian shared frailty distributions are displayed in Table 2.

The four parametric AFT baseline distributions with Gamma and inverse-Gaussian frailty distributions were fitted by using *kebele* as a frailty component. The frailty effect was statistically significant for all the parametric survival AFT models, both in the null and full models. The frailty in the final model is assumed to follow an inverse-Gaussian distribution with a mean of 1 and a variance equal to theta (θ). The variance of the random effect ($\theta=0$) would mean that the frailty component does not contribute to the model. The estimated variability (heterogeneity) in the population of clusters (*kebeles*) using the Weibull inverse-Gaussian shared

Table 2 Comparison of the different parametric AFT shared frailty models based on the AIC and BIC values

Baseline distribution	Frailty distribution	AIC	BIC	Variance (θ)	p-value of LR test of $\theta=0$
Exponential	Gamma	1858.14	1945.11	0.080	<0.001
	Inverse-Gaussian	1857.50	1944.48	0.084	<0.001
Weibull	Gamma	1779.42	1871.52	0.117	<0.001
	Inverse-Gaussian	1779.13	1871.23	0.126	<0.001
Lognormal	Gamma	1787.85	1879.94	0.101	<0.001
	Inverse-Gaussian	1787.45	1879.55	0.106	<0.001
Loglogistic	Gamma	1785.84	1877.93	0.107	<0.001
	Inverse-Gaussian	1785.37	1877.46	0.112	<0.001



frailty model was 0.126, which means that 12.6% of the variation in the time to drop out was accounted for unobservable cluster-level factors. The likelihood ratio test that assumes a variance of frailty $\theta=0$ resulted in a highly statistically significant p-value of <0.001 , indicating that the frailty component has a significant contribution to the model and that there is an intra-cluster correlation. The estimated value of the variance of the frailty in the null model was 0.161. The associated Kendall's tau (τ), which measures the intra-cluster dependence was estimated to be 0.075 and 0.059 for the null and full models respectively. The value of the shape parameter in the Weibull inverse-Gaussian shared frailty model was greater than unity ($\rho=1.573$, its p-value <0.001), which indicates that the hazard increases to a maximum point and then decreases over time, resulting in a unimodal hazard function which is due to the frailty effect [43].

The goodness of fit of the final model was checked using the Cox-Snell residuals plot. The Cox-Snell residuals plot of the Weibull AFT inverse-Gaussian frailty model was closer to the 45-degree straight line, with a slight deviation in the right tail, suggesting that the model well-fitted the time to drop out data (Fig. 2). Some variability is expected at the 45-degree straight line, especially in the right tail, although we have a well-fitting model. This deviation was due to reduced effective sample size caused by earlier dropouts [47].

Analytical results of the Weibull AFT inverse-Gaussian shared frailty model

Based on the values of the AIC and BIC, and variance of the frailty effect, the Weibull inverse-Gaussian shared frailty model was selected as the preferred parametric survival model to analyze the data. Variables with a p-value of <0.20 in the univariate analysis of the Weibull inverse-Gaussian shared frailty model were included in the multivariable analysis.

If the hierarchical nature of the data was not taken into account while doing the univariate and multivariable analysis of the survival models, it makes sense to perform a separate analysis for each district. However, because the frailty survival model takes cluster (sub-district) level characteristics into account, we analyze it by combining data from the two districts.

In the univariate analysis, age, gender, and marital status of the household head; household size; self-rated health status; the presence of chronic illness in the household; history of hospitalization under the scheme; perceived quality of health care; perceived risk protection; and trust in the scheme were significantly associated with time to drop out at p-value <0.05 , while the educational status of the household head, wealth tertile, participation in a safety net program and value towards solidarity were not statistically significant at p-value <0.20 . After fitting the multivariable inverse-Gaussian shared frailty model, the Weibull distributions of selected variables were plotted over the respective Kaplan-Meier curves to show

how well the estimated Weibull survival plots fitted the data (Fig. 3).

After adjusting for other independent variables, and keeping households in the same cluster, all variables included in the multivariable analysis were significantly associated with the time to drop out of the CBHI scheme at 95% confidence level, except age, gender, and

self-rated health status (Table 3). Accordingly, the time to drop out for married household heads was increased by a factor of 1.610 compared to their counterparts of divorced or widowed household heads ($\delta = 1.610$; 95% CI: 1.216, 2.130). Scheme members having larger household sizes adhere to the scheme longer compared to those having smaller household sizes with an

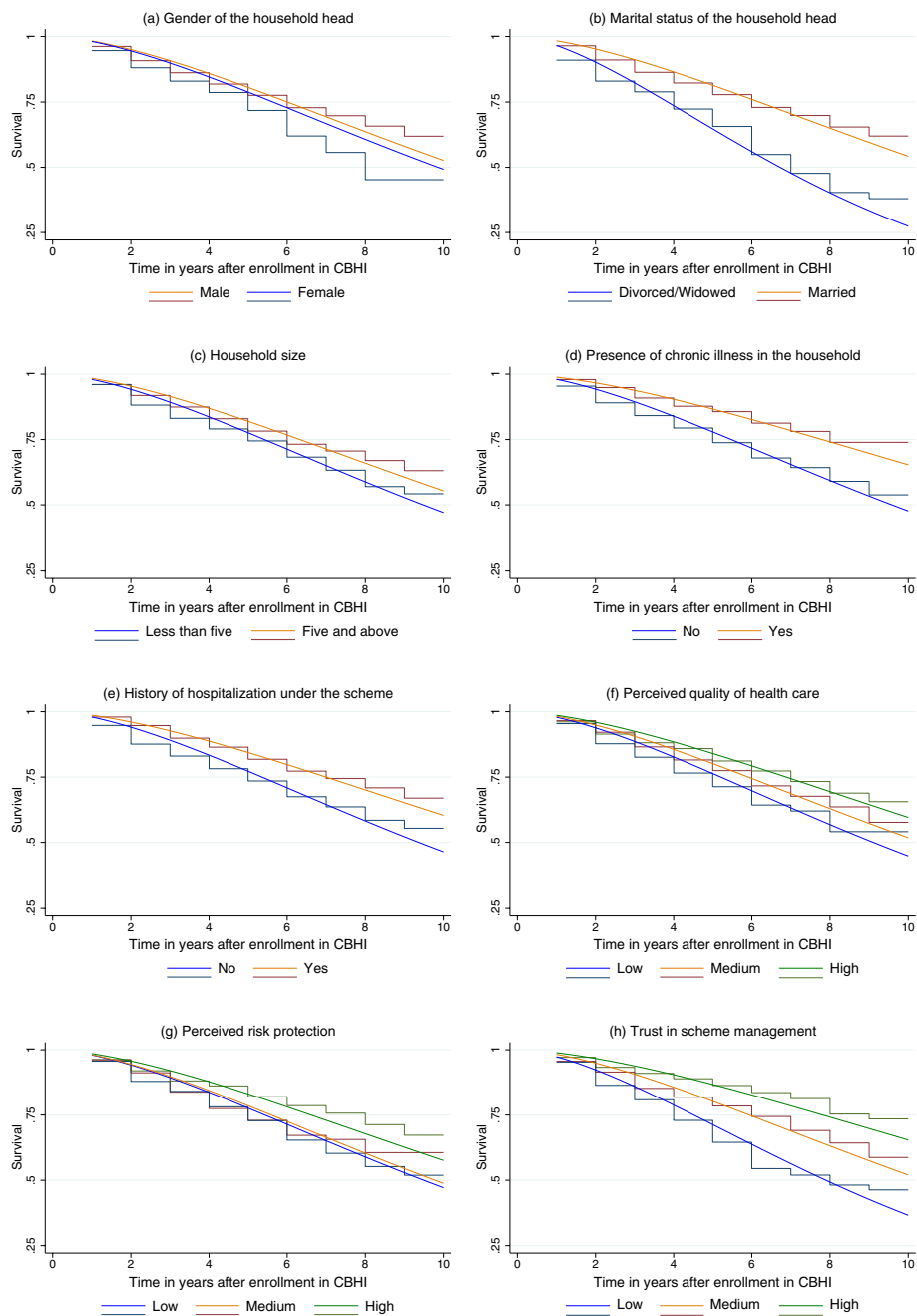


Fig. 3 Kaplan–Meier curves (stairstep lines) and Weibull survival plots (solid lines) for selected variables associated with the time to drop out of CBHI

Table 3 Multivariable analysis using the Weibull inverse-Gaussian shared frailty model on predictors of time to drop out

Variables	Categories	Coef	S. E	δ	p-value	95% CI for δ
Intercept		1.356	0.205	3.879	0.000	(2.598, 5.793)
Age in years	25–44	ref				
	45–64	-0.014	0.076	0.986	0.850	(0.849, 1.145)
	65 +	0.172	0.119	1.188	0.148	(0.941, 1.501)
Gender	Male	ref				
	Female	-0.063	0.124	0.939	0.611	(0.735, 1.198)
Marital status	Divorced/widowed	ref				
	Married	0.476	0.143	1.610	0.001	(1.216, 2.130)
Household size	Smaller (< 5)	ref				
	Larger (\geq 5)	0.155	0.072	1.168	0.032	(1.013, 1.346)
Self-rated health	Fair	ref				
	Good	0.037	0.108	1.037	0.736	(0.839, 1.282)
	Very good	-0.081	0.113	0.922	0.471	(0.739, 1.150)
Chronic illness	No	ref				
	Yes	0.353	0.102	1.424	0.001	(1.165, 1.740)
Hospitalization	No	ref				
	Yes	0.267	0.080	1.306	0.001	(1.118, 1.527)
Perceived quality of health care	Low	ref				
	Medium	0.127	0.085	1.135	0.135	(0.961, 1.340)
	Haigh	0.279	0.093	1.322	0.003	(1.100, 1.587)
Perceived risk protection	Low	ref				
	Medium	0.030	0.094	1.031	0.748	(0.857, 1.240)
	Haigh	0.197	0.087	1.218	0.023	(1.027, 1.444)
Trust in scheme	Low	ref				
	Medium	0.274	0.088	1.315	0.002	(1.107, 1.563)
	Haigh	0.549	0.098	1.731	0.000	(1.428, 2.098)
		$\ln(\rho) = 0.453$ ($p < 0.001$)		$\gamma = 0.636$ (S.E = 0.028)		
		$\rho = 1.573$ (S.E = 0.069)		$\tau = 0.059$		
		$\theta = 0.126$ (S.E = 0.066)		AIC = 1779.13, BIC = 1871.23		

CI Confidence Interval, *coef* regression coefficient, *S.E* Standard error; δ Acceleration Factor, ρ Shape parameter, γ Scale parameter, $\gamma = 1/\rho$; θ - Variance of the random effect, τ Kendall's tau, $\tau = \theta/\theta + 2$, where $\tau = \epsilon(0, 1)$, *ref* reference category; *AIC* Akaike's Information Criterion, *BIC* Bayesian information criterion

acceleration factor of 1.168 ($\delta = 1.168$; 95% CI: 1.013, 1.346).

The time to drop out for scheme members who had a known chronic illness increased significantly by an acceleration factor of 1.424 ($\delta = 1.424$; 95% CI: 1.165, 1.740). This shows that years of membership adherence for households who had a chronic illness in their household was extended by 42.4% compared to those without a chronic illness. Similarly, the time to drop out for households who had received inpatient service under the scheme was estimated to be 1.306 times that of households who did not receive inpatient service ($\delta = 1.306$; 95% CI: 1.118, 1.527).

The time to drop out for scheme members who rated the quality of health care as high was estimated to be 1.322 times that of households who rated it as low ($\delta = 1.322$; 95% CI: 1.100, 1.587). The time to drop out

for scheme members who had a high-level perception on the risk protection ability of the scheme was estimated to be 1.218 times that of households who had low-level perception ($\delta = 1.218$; 95% CI: 1.027, 1.444). Likewise, the time to drop out for scheme members who had medium and high-level trust in the scheme is extended by 31.5% and 73.1%, respectively compared to those who had low-level trust in the scheme ($\delta = 1.315$; 95% CI: 1.107, 1.563) and ($\delta = 1.731$; 95% CI: 1.428, 2.098), indicating higher adherence to the scheme.

Discussions

Although there are a handful of studies that investigated the factors that influence membership renewal (drop-out), none of these consider the time to drop out among scheme members. Most of these studies also measure membership dropout rates after a few years of scheme implementation. In contrast to most previous studies,

our study attempted to elaborate on the factors that are associated with continued adherence (time to drop out) among CBHI members with a 10-year follow-up period. Moreover, this study considered the effect of unobserved cluster-level variables that determine continued membership adherence.

After adjusting for other independent variables, and keeping households in the same cluster, results of the multivariable regression analysis revealed a number of factors associated with the time to drop out of CBHI. Accordingly, married household heads adhere to the scheme longer compared to their counterparts of divorced or widowed household heads. This finding is consistent with a study in Ghana, where married respondents were more likely to renew their health insurance [21]. This could be because married heads of households might have a higher ability to pay for health insurance since marital status has a positive correlation with economic status [48]. Contrary to this, another study in Ghana reported that married migrant head porters were significantly less likely to renew their membership than single migrant head porters [22]. The difference might be attributed to a difference in the study population and scheme design. In the latter study, the study participants were female migrant head porters who were enrolled in the scheme free of charge.

This study found that household size had a positive effect on prolonging the time to drop out of CBHI. The larger the household, the higher the probability of maintaining membership in the scheme. It seems that household size had a localized effect on membership renewal. Different studies reported conflicting evidence on the association between household size and renewal decisions. One study in Ethiopia found that larger households were more likely than relatively smaller households to extend their policy [19]. This finding is also corroborated by a systematic review which showed that household size was a facilitator of renewal decisions [49]. This might be because larger household sizes are prone to higher out-of-pocket health care expenditures [50]. Risk-averse households with larger family sizes might prefer to maintain insurance membership to avoid the risk of catastrophic expenditures.

Contradiction to our finding, other studies conducted elsewhere reported a negative correlation between household size and renewal decision [17, 22, 35]. It could be argued that the subscription fees in the schemes investigated by the later studies were levied according to the size of the household, which resulted in a higher premium for larger households. This in turn might be a barrier to maintaining their membership. That was not the case in the Ethiopian context until the time of this study, where all households with a household size of five or less

contribute the same premium (\$8.8800 per year) with an addition of only \$1.2686 and \$2.5371 for the next two levels of contributions for January 2021 renewal period. Although enrollment was set at the household level to limit adverse selection [18], it appears that the premium design in the context of this study creates some other form of adverse selection by retaining relatively larger households that are at higher risk of health care expenditure. Another explanation is the possibility of partial enrollment (enrolling only at-risk individuals like children, elders, and those with illness experiences) to avoid additional payment for a family size larger than five [51]. Further research is recommended to explore this problem, preferably with a qualitative approach. This finding provides lessons for policymakers to devise strategies to attract small size households and minimize potential partial enrollment, which in part can address the problem of adverse selection.

The households' chronic illness experiences also influence the decision to remain in the scheme. The membership duration for those who had a family member with chronic illness in the household was extended significantly compared to those without chronic illness. This finding complements what has already been found in the literature on the link between the presence of chronic illness in the family and renewal decisions [18, 24, 26]. The result mainly indicates the possible existence of adverse selection, which is a common event in schemes where membership is voluntary and contributions are independent of individual health risks [52]. This phenomenon has two implications that are worth discussing here. From the equity point of view, CBHI is promoting health care access to high-risk subsistence farmers who otherwise would be forced to catastrophic health expenditure or exposed to an increased risk of severe complications for those who forgo treatment due to inability to cover the cost of health care. The second insight is from the scheme's performance and sustainability perspective. The result points out that the scheme is unable to retain healthy scheme members which raises concerns about the risk profile of members remaining in the scheme. The insurance pool would be left with high-risk individuals who had higher health care needs, for which the premium is insufficient to cover total claims, which in turn could hamper the financial sustainability of the scheme [53].

This study verified that hospitalization, which is both an illness and service utilization indicator, was positively associated with the time to drop out of CBHI. Receiving inpatient service (hospitalization) under CBHI coverage motivates households to extend their membership. A possible explanation for this finding is that those who have been hospitalized under the coverage of the scheme

might have enjoyed the benefit of health insurance more than others. They might have received advanced health care that would have cost them excess money or was beyond their ability to cover its cost. Through their experience, they might have the opportunity to learn and understand the basic principles underlying health insurance. Earlier work in India reported that hospitalization under the scheme was negatively associated with renewal probability [14]. The authors argue that the possible reasons could be the poor quality of health care and the negative claims experience faced by scheme members. Scheme managers need to devise mechanisms to maximize the benefit of CBHI to retain their members.

The perception that health care is of good quality is an important enabler of continued membership adherence. Household heads who rated the quality of health care as high adhere to the scheme longer compared to those who rated it as low. The result confirmed that health care quality is an important consideration in the household's decision to remain as a scheme member. This is consistent with the existing literature [19, 23–25], although different indicators have been used to measure health care quality. Qualitative studies have also documented different issues linked to the quality of health care as important barriers for membership adherence [15, 54–58]. This finding is not surprising, as the quality of health care is central to the success of any community-based and micro health insurance initiatives aimed at achieving universal health coverage [5, 59, 60]. If the health facilities fail to provide high-quality services, the insured will lose trust in the service provider and the insurance plan and will opt for other care alternatives outside the system [61]. Therefore, members will be unlikely to maintain their subscriptions [49, 62]. This is an important area of intervention that policymakers and other relevant stakeholders should focus on to retain CBHI members and assure the sustainability of the scheme. It might be linked to the respondents' perception of the ability of CBHI to protect them from financial risks and their trust in the scheme.

In the regression analysis, the household head's perception on the ability of CBHI to protect its members from financial risks was significantly associated with continued membership adherence. Households who had a high-level perception on the risk protection ability of the scheme had a higher survival probability compared to those with low-level perceptions. One of the primary purposes of universal health coverage targeted efforts, including health insurance initiatives is to abolish the requirements to pay directly at the time of health service utilization [1, 63]. This can be achieved through prepayment and pooling approaches that generate stable and sufficient funds for health, which enable contracted health facilities to provide uninterrupted services

[64]. Once members of the scheme paid the premium, they would expect to receive health care without the need to pay at the time of receiving health care. If they are required to pay at the time of health service utilization, they might lose their confidence in the scheme and decide to cancel their policy.

Results from this study also indicated that the household head's trust in the scheme played an important role in extending the time to drop out among scheme members. Policyholders who had medium and high-level trust in the scheme had longer adherence to the scheme compared to those who had low-level trust. This means that subscribers who believe the scheme does good for the community; the scheme will pay for everything it is supposed to, even really expensive treatments; the scheme staff are completely honest and reliable, and the staff care about their health just as much or more than they do; remain long in the scheme compared to their counterparts. Our finding is in line with results from prior studies which showed that trust in the scheme was a significant enabler of membership adherence [19, 25, 37]. This finding is also supported by findings of meta-analysis and systematic reviews which revealed that trust in insurance schemes was a facilitator of renewal decisions [49].

One fascinating issue in our study is the role of the wealth index, which showed no significant correlation with the time to drop out of CBHI. The results of the existing literature showed that the socio-economic status of households was significantly linked to membership renewal decisions, regardless of whether it was measured in terms of asset category, expenditure, or income. Households with higher economic status were more likely to renew their policy compared to those with lower economic status [13, 14, 17, 22, 26, 34]. This difference might be linked to the study population and premium affordability. Our study excludes indigents that are fee waiver beneficiaries, which otherwise could not adhere to the scheme membership if they were made to pay the premium. A prior study in Ethiopia stated that the bulk of households were able to afford the premium [18], which might be in part due to deliberate government efforts to provide a fee waiver for the poorest segments of the population. Another study documented that level of premium affordability was not significantly associated with dropout decisions [19]. A household's ability to afford the scheme is a function of its economic status. As long as premium affordability is not the concern of the population, the economic status of the household might not have a role in influencing continued membership adherence. In line with our finding, recent work in Ethiopia reported that there was no significant link between the wealth index and policy

renewal [19]. This finding implies the role of providing fee waivers for indigents in assuring the equity goal of universal health coverage. To sum up, the findings of this study on some of the predictors of time to drop out are consistent with the literature, whereas for some other predictors it contradicts with studies conducted in other countries. It could be understood that the study setting, including the scheme design (premium affordability, level of premium contribution per household size, and fee waiver policy) and the study population, which includes only paying scheme members, had an important bearing on the observed discrepancy.

Despite the study provides useful insights into CBHI and other voluntary insurance schemes, it is not without limitations. The study might be prone to recall bias in the measurement of the perceived quality of health care. Some respondents who had no recent visit to public health facilities, might not be as critical as those who had a recent visit experience. Second, the items set to measure value towards solidarity might also be subjected to social desirability bias, for which most respondents might rate the items higher than their true feelings which could narrow the variation. Third, since the factors and the outcome of interest were measured at the same point in time, there exists the possibility of reverse causality.

Conclusions

The presence of chronic illness in the family and household size were significant and positive predictors of the membership duration in CBHI, pointing out the existence of adverse selection. In the latter one, it appears the problem is related to the design of the premium which attracts larger households to the scheme. This indicates the need to reconsider the premium level in line with household size. Despite CBHI is enhancing health care access to its members particularly for high-risk individuals living with chronic conditions, it lacks the ability to protect them from financial hardships at the time of receiving health care. This implies that the scheme could not be able to generate adequate funds to satisfy the health care needs of its members. History of hospitalization under the scheme was a positive predictor of the time to drop out of CBHI, which implies that those who enjoyed the benefit of health insurance prefer to maintain their subscription. The findings of this study have implications for addressing issues related to health care quality. Unless scheme members are receiving good quality health care under the scheme, they might lose trust and develop a negative attitude towards the scheme.

Abbreviations

AFT: Accelerated Failure Time; AIC: Akaike's Information Criterion; BIC: Bayesian information criterion; CBHI: Community-Based Health Insurance; ODK: Open Data Kit; SD: Standard Deviation.

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Authors' contributions

MH conceptualized the study, designed the study, collected the data, analyzed and interpreted the data, and drafted the manuscript. MA and NBB contributed to survey design data collection and statistical analysis and reviewed the manuscript. All authors read and approved the final manuscript.

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Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Institutional Review Board (IRB) of College of Medicine and Health Science, Bahir Dar University with protocol number 001/2021. Before the interview, oral informed consent was secured from each study participant. Confidentiality was assured through collecting anonymous information and by informing the participants that personal identifiers would not be revealed to a third party.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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BMJ Open Perceived quality of care among households ever enrolled in a community-based health insurance scheme in two districts of northeast Ethiopia: a community-based, cross-sectional study

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ABSTRACT

Objectives To examine how clients perceived the quality of healthcare they received and identify associated factors both at the individual and facility levels.

Design A community-based, cross-sectional study.

Setting Two rural districts of northeast Ethiopia, Tehulederie and Kallu.

Participants 1081 rural households who had ever been enrolled in community-based health insurance and visited a health centre at least once in the previous 12 months. Furthermore, 194 healthcare providers participated in the study to provide cluster-level data.

Outcome measures The outcome variable of interest was the perceived quality of care, which was measured using a 17-item scale. Respondents were asked to rate the degree to which they agreed on 5-point response items relating to their experiences with healthcare in the outpatient departments of nearby health centres. A multilevel linear regression analysis was used to identify predictors of perceived quality of care.

Results The mean perceived quality of care was 70.28 (SD=8.39). Five dimensions of perceived quality of care were extracted from the factor analysis, with the patient-provider communication dimension having the highest mean score (M=77.84, SD=10.12), and information provision having the lowest (M=64.67, SD=13.87). Wealth status, current insurance status, perceived health status, presence of chronic illness and time to a recent health centre visit were individual-level variables that showed a significant association with the outcome variable. At the cluster level, the work experience of healthcare providers, patient volume and an interaction term between patient volume and staff job satisfaction also showed a significant association.

Conclusions Much work remains to improve the quality of care, especially on information provision and access to care quality dimensions. A range of individual-level and cluster-level characteristics influence the perceived quality of care. For a better quality of care, it is vital to optimise the patient-provider ratio and enhance staff job satisfaction.

INTRODUCTION

Healthcare providers and patients define the quality of care differently and attach

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study tried to assess the quality of care from the clients' point of view using a validated multidimensional scale.
- ⇒ This is the first cross-sectional study in Ethiopia, which considered health centre (cluster) level variables that have an association with perceived quality of care.
- ⇒ The observed association between current insurance status and perceived quality of care could be due to an endogeneity issue created by omitted variables.
- ⇒ The use of a relatively small cluster sample size in this study may limit the accuracy of the estimates in the multilevel modelling.
- ⇒ Because of the cross-sectional nature of the study, it is impossible to establish a cause-and-effect relationship.

varying levels of importance to its attributes. When assessing the quality of care, healthcare professionals tend to prioritise technical competence, while patients place a high value on patient-centeredness, amenities and reputation.¹ The emphasis on healthcare quality measurement has shifted away from the viewpoints of healthcare providers to people-centred approaches that rely on patient perceptions.²⁻⁴ Patients' perception of healthcare quality has become an essential element of quality measurement due to its link with health service utilisation. It is based on a mix of patient experiences, processed information and rumours.⁵

Patient experience surveys elicit data on the transactional components of care, which are process-related, as well as the interpersonal interactions that occur over the course of care.⁶ Individuals receiving care are asked about their experiences of health facility encounters to report if particular processes or

events occurred.⁷ Patient experience measurements have received increased attention and are widely employed to inform quality improvement, and pay-for-performance.⁸ Patient experience is consistently and positively associated with patient safety and clinical effectiveness, adherence to prevention and treatment recommendations and technical quality of care.^{9,10}

Patient experience is a reflection of the patient journey, which consists of the myriad interactions patients have with healthcare providers and the healthcare system over time and in a variety of settings. It is shaped by the healthcare team, the organisation and the surrounding policy and regulatory environment. A negative patient experience is a proxy for a larger health system failure, underscoring the need to apply a systems approach to improving healthcare quality.⁴

Quality of healthcare is vital to the success of universal health coverage (UHC) initiatives, like community-based health insurance (CBHI). To achieve the desired outcomes, the development of CBHI schemes must be accompanied by improvements in healthcare quality.^{2,4,11–13} To build sustainable CBHI schemes, members must believe that the benefits of healthcare provided via health insurance coverage outweigh the benefits of not being insured.¹⁴ Patients' positive experiences with the quality of care provided under insurance schemes increase their trust in the health system and insurance schemes.^{15,16} As a result, they are more likely to use healthcare services and participate in health insurance plans.¹⁷ If insured clients are unable to access high-quality services, they lose trust in service providers and seek care elsewhere,¹⁸ making them less likely to pay premiums.^{19,20} Low perception of healthcare quality further deters people from interacting with the health system in the future.⁴

Although increased healthcare coverage is promising with the implementation of CBHI initiatives, quality of care remains a key impediment to achieving UHC.^{13,21} For example, >8 million deaths amenable to a high quality of care occurred in low-income and middle-income countries, making the poor quality of care a bigger obstacle to mortality reduction than lack of access to care.²¹ Poor quality of care is also a major issue that jeopardises the long-term viability of many CBHI schemes.^{11,22} Findings of systematic reviews revealed that the quality of care was a key factor that influenced enrolment and renewal decisions of CBHI membership.^{23,24} Some quality concerns include 'unavailability and perceived poor quality of prescribed medicines, misbehaviour of health professionals and the differential treatment of the insured in favour of the uninsured patients, unclean hospital environment, long queues, lack of diagnostic equipment and long waiting hours to obtain healthcare.'²⁴

To promote optimal utilisation, stable finance and better outcomes, the quality of healthcare must be monitored on a regular basis.¹⁸ Previous studies in Ethiopia focused on surveys of client satisfaction and did not employ multidimensional measurement scales.^{25,26} To our knowledge, the quality of care delivered under the CBHI

in Ethiopia has never been investigated using multidimensional metrics from the perspective of service users at the community level. There is also a paucity of literature on facility-level variables that influence the quality of care. Therefore, the purpose of this study was to examine the perceived quality of care (PQoC) from the perspective of clients and identify associated factors at the individual and facility level.

Improving the quality of care under the CBHI is among Ethiopia's top priorities in its health sector strategic plan.²⁷ The findings of this study will inform relevant stakeholders on the current state of clients' perceptions of the quality of care and will be an essential input for quality improvement initiatives. It will also provide useful information for decision-makers to address challenges in the country's endeavours to establish higher-level insurance pools.

METHODS

Study setting and population

A community-based cross-sectional study was conducted in rural parts of two neighbouring districts in northeast Ethiopia, Tehulederie and Kallu. Tehulederie is divided into 20 rural and 7 urban *Kebeles* (subdistricts) with a population of 145 625, of which 87.5% reside in rural areas. There are five health centres and one primary hospital in the district. It was one of the 13 districts in Ethiopia where CBHI was piloted in 2011. The scheme was introduced in Kallu district after 2 years, in July 2013. Kallu is divided into 36 rural and 4 urban *Kebeles* and has 9 health centres. It is the most populous district in the zone, with a population of 234 624, of which 89.11% live in rural areas.²⁸

The study population of interest was rural households who had been ever enrolled in the CBHI scheme before January 2020. To minimise recall bias, households who had not used healthcare in the 12 months before data collection were excluded from the study.

Sample size and sampling procedure

The sample size was calculated using MedCalc software by assuming a mean difference of two independent groups. A previous study on PQoC reported mean scores of 5.2 and 5.4 with SD of 0.8 and 0.7 among insured and uninsured respondents, respectively.²⁹ Using this output and assuming an 80% power, 95% confidence level and equally sized groups, a sample size of 446 was calculated. Considering a design effect of 1.5 attributable to multi-stage sampling and a potential non-response rate of 10%, the effective sample size was estimated to be 736 households. An alternative sample size of 1257 was calculated for a companion article as part of a research project examining the sustainability of a CBHI in Ethiopia.³⁰ Among those, 1081 eligible households participated in this study. Furthermore, 194 healthcare providers from 12 health centres participated in the study to provide cluster-level data.

The study participants were recruited using a three-level multistage sampling approach. First, 12 clusters of *Kebeles* organised under a health centre catchment area were selected. Then, 14 rural *Kebeles* were drawn randomly using a lottery method proportional to the number of *Kebeles* under each cluster. Accordingly, five *Kebeles* from Tehulederie and nine from Kallu were included. A list of households who have ever been enrolled in the CBHI was obtained from the membership registration logbook of each *Kebele*. The required sample was generated at random from each *Kebele*, proportional to the number of households who have ever been enrolled in the scheme, using random number generator software.

Data collection and measurement

The data were collected from 4 February to 21 March 2021. Individual-level data were collected through face-to-face interviews with household heads at their homes or workplace using a structured questionnaire via an electronic data collection platform. The data collectors submit the completed forms to a data aggregating server daily, which allowed us to review the submissions and streamline the supervision process.

The PQoC, which is the outcome variable of interest, was measured using a 17-item scale designed after a thorough review of validated tools.^{29 31–34} Respondents were asked to rate the extent to which they agreed on a set of items relating to their experiences with the healthcare they received in the outpatient departments of nearby health centres. Each item was designed on a 5-point response format with 1—strongly disagree, 2—disagree, 3—neutral, 4—agree and 5—strongly agree. The summary scores for the PQoC and its dimensions were calculated for individual respondents by adding the scores of each item. This gives a scale ranging from 17 (1×17) to 85 (5×17) for the overall PQoC score. For quality dimensions consisting of three and four items, the scale ranges from 3 to 15 and 4 to 20, respectively. When reporting the results, the scores were arithmetically transformed to a scale of 20–100.³⁵ This allows the comparison of mean scores of PQoC, its dimensions and each measurement item on a common scale.

Wealth index was generated using the principal component analysis method. The scores for 15 types of assets were translated into latent factors, and a wealth index was created based on the first factor that explained most of the variation. The study households were grouped into wealth tertile—lower, medium and higher based on the index. Perceived health status was measured based on a household head's subjective assessment of the health status of the household, and was rated as 'poor, fair, good, very good or excellent'. However, for analysis purposes, it was recategorised into 'fair, good and very good', by merging the two extreme response categories to the next option due to fewer replies.

Before the data collection, the questionnaire was pretested on a sample of 84 randomly selected participants in one *Kebele*. As part of the pretest, a cognitive interview

was conducted on selected items using the verbal probe technique among eight respondents to determine if the items and response categories were understood, and interpreted by the potential respondents as intended. Accordingly, the phrasing of some items and response options were modified, and some items were omitted.

Cluster-level data were collected from 12 health centres that provide healthcare for the population in the sampled *Kebeles*. Patient volume data were obtained by reviewing the monthly service delivery reports of health centres, while data related to work experience, affective commitment and job satisfaction were collected through a self-administered questionnaire among healthcare providers who worked >1 year in the current facility.

Patient volume was measured using the daily average number of patients managed by a healthcare provider in the outpatient department. It was calculated by dividing the number of patients who visited the health centre in the last 6 months before the study by the number of working days, and then by the number of consultation rooms in each health centre.³⁶ Affective commitment and job satisfaction were composite variables that were assessed using a 5-point Likert scale. Affective commitment was measured with a seven-item questionnaire based on a modified version of the Meyer *et al* scale, which had previously been used in a hospital setup.³⁷ Staff job satisfaction was measured using a 10-item scale, which was adapted from a previous study among healthcare workers in Ethiopia.³⁸ Average affective commitment and job satisfaction scores were computed for each health centre.

Data analysis

The data were analysed using Stata V.17.0. Exploratory factor analysis was performed to assess the validity of the quality measurement scale. Bartlett's test of sphericity and Kaiser-Mayer-Olkin's (KMO) measure of sampling adequacy were performed to assess the appropriateness of the data for factor analysis. The principal component method of extraction and Promax rotation with Kaiser normalisation was used. The Eigenvalue greater than one decision rule was used to determine the appropriate number of factors to be extracted. Items with both loadings and communalities below 0.40 were removed from the analysis.³⁹ Correlation coefficients were used to test construct validity. Item-total score correlation, dimension-total score correlation and dimension intercorrelation were computed. The total score was the mean score of the ratings for all items of the scale, and the dimension score was the factor score. A questionnaire has good construct validity when the item-total score correlations are >0.40, dimension intercorrelations are <0.80 and dimension-total score correlations are higher than dimension intercorrelations.³² Cronbach's alpha coefficients were generated for each dimension to assess the internal consistency. The reliability of the scale was considered acceptable if Cronbach's alpha coefficient was 0.60 or higher.³⁹

To compare mean scores of PQoC and its dimensions among subgroups, an independent t-test and a one-way analysis of variance (ANOVA) with Tukey's post hoc test were used. Because the outcome variable was considered a continuous variable, a multilevel linear regression model was fitted to identify its predictors. The PQoC was assumed to be influenced by the characteristics of households (individual-level variables) as well as the characteristics of health centres (cluster-level variables). Cluster-level data were linked to individual-level data based on the usual source of healthcare for each study participant. Considering the hierarchical structure of the data, where patients are nested within health centres, a two-level linear regression model was applied. In this study, there were 12 health centres (level-two units), hence the restricted maximum likelihood estimation approach was employed because it is appropriate for smaller cluster sizes.⁴⁰ Four models were estimated to choose the one that best fits the data. The first model or the null model (a model without predictors) is given by:

$$Y_{ij} = \gamma_{00} + u_{0j} + \varepsilon_{ij} \quad (1)$$

The null model estimates three parameters: the average intercept (γ_{00}), the between-health centre error, or deviation, from the average intercept (u_{0j}), and the individual-level residual, or variation in individual scores within health centres (ε_{ij}). The second model estimated PQoC (Y_{ij}) for individual household i at health centre j . We treat PQoC as a function of a matrix of individual-level variables (X_{ij}), which include age, gender, education and marital status of the household head; wealth status; household size; current health insurance status; the presence of chronic illness in the household; perceived health status and time to a recent visit to a health centre, and expressed as:

$$Y_{ij} = \gamma_{00} + \gamma_{10}X_{1ij} + \gamma_{20}X_{2ij} + u_{1j}X_{1ij} + u_{2j}X_{2ij} + \dots + \gamma_{n0}X_{nij} + u_{nj}X_{nij} + u_{0j} + \varepsilon_{ij} \quad (2)$$

where $u_{1j}, u_{2j}, \dots, u_{nj}$ indicate the random error terms connected to each X_{ij} .

The third model estimated the PQoC as a function of cluster-level variables (Z_j) that include average work experience, affective commitment and job satisfaction of healthcare providers and patient volume. The model accounts for the variation among health centres and explains it in terms of these characteristics. It is given by:

$$Y_{ij} = \gamma_{00} + \gamma_{01}Z_{1j} + \gamma_{02}Z_{2j} + \dots + \gamma_{0n}Z_{nj} + \gamma_{11}PV_j \times JS_j + u_{0j} + \varepsilon_{ij} \quad (3)$$

where $PV_j \times JS_j$ indicates an interaction term between patient volume and job satisfaction in which job satisfaction was assumed to moderate the effect between patient volume and PQoC. The interaction effect was tested by plotting the marginal effects of interaction terms. The two variables were centred towards the grand mean to facilitate the interpretation of the coefficients. By combining models II and III, the fourth model estimated the PQoC as a function of both individual-level and cluster-level variables, and can be written as:

$$Y_{ij} = \gamma_{00} + \gamma_{10}X_{1ij} + \gamma_{20}X_{2ij} + u_{1j}X_{1ij} + u_{2j}X_{2ij} + \dots + \gamma_{n0}X_{nij} + u_{nj}X_{nij} + \gamma_{01}Z_{1j} + \gamma_{02}Z_{2j} + \dots + \gamma_{0n}Z_{nj} + \gamma_{11}PV_j \times JS_j + u_{0j} + \varepsilon_{ij} \quad (4)$$

where γ_{10} and γ_{01} are the vector of coefficients of n explanatory variables whose values are at $X_{1ij}, X_{2ij}, \dots, X_{nij}$ for the i th individual within the j th cluster, and $Z_{1j}, Z_{2j}, \dots, Z_{nj}$ for the j th cluster, respectively. The intercept γ_{00} and slopes γ_{01}, γ_{10} and γ_{11} are fixed effects, while u_{0j}, u_{1j} and ε_{ij} are random effects.

This multilevel regression decomposes the total variances into two independent components: σ_e^2 , which is the variance of individual-level errors ε_{ij} , and σ_{u0}^2 , which is the variance of cluster-level errors u_{0j} . From this model, we can define the intraclass correlation (ICC) by the equation⁴¹:

$$ICC = \sigma_{u0}^2 / (\sigma_{u0}^2 + \sigma_e^2)$$

The ICC and proportional change in variance (PCV) were used to report the measures of variation (random effects). The need for multilevel analysis, which considers cluster-level factors, was tested using the ICC. The ICC shows the variation in PQoC accounted for cluster-level characteristics. Statistically significant variability between health centres justifies the need to consider cluster-level factors.⁴² The PCV expresses the change in the cluster-level variance between the empty model and models with more terms and is calculated by $PCV = (V_A - V_B) / V_A$, where V_A is the variance of the null model and V_B is the variance of the model with more terms. It measures the total variation explained by individual-level and cluster-level factors.

The measures of association (fixed-effects) estimate the association between the PQoC score and various explanatory variables. The existence of a statistically significant association was determined at p values of <0.05. The degree of the association was assessed using regression coefficients, and their statistical significance was determined at a 95% CI. Models were compared using the Deviance Information Criteria (DIC) and Akaike Information Criteria (AIC). The best-fit model was determined to have the lowest DIC and AIC values. The preliminary analysis confirmed no violation of the assumptions of normality, linearity, homoscedasticity and multicollinearity. The presence of multicollinearity was determined using the variance inflation factor with a cut-off point of 5.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

RESULTS

Background characteristics of the study participants

The household survey included 1081 respondents who had visited a health centre at least once in the previous 12 months prior to the study. The average age of the study participants was 49.25 years (SD=12.07), with slightly more than half (51.34%) between the age ranges of 45

Table 1 Independent t-test and one-way ANOVA comparing mean scores of the PQoC (20–100 scale) across respondent characteristics in two districts of northeast Ethiopia, 2021

Variable	Categories	N=1081	%	PQoC score		t-test/F-test
				M	SD	
Age (years)	25–44	389	35.99	69.97	7.78	1.08
	45–64	555	51.34	70.26	8.52	
	65+	137	12.67	71.20	9.49	
Gender	Men	938	86.77	70.15	8.21	–1.31
	Women	143	13.23	71.13	9.51	
Marital status	Divorced/Widowed	78	7.22	71.61	10.95	1.46
	Married	1003	92.78	70.17	8.16	
Attend formal education	No	855	79.09	70.29	8.48	0.07
	Yes	226	20.91	70.24	8.05	
Household size	<Five	403	37.28	70.85	8.63	1.73
	≥Five	678	62.72	69.94	8.25	
Wealth tertile	Lowest	361	33.40	71.77	9.15	8.83**
	Medium	360	33.30	69.36 ^b	8.16	
	Highest	360	33.30	69.70 ^b	7.62	
Current insurance status	Ex-member	139	12.86	67.66	9.65	–3.96**
	Active member	942	87.14	70.66	8.13	
Perceived health status	Fair	207	19.15	72.28	8.84	8.04**
	Good	511	47.27	70.08 ^b	7.83	
	Very good	363	33.58	69.41 ^b	8.73	
Chronic illness	No	803	74.28	69.54	8.29	–4.96**
	Yes	278	25.72	72.40	8.33	
Last health centre visit	<3 months	499	46.16	70.75 ^b	8.99	4.78*
	3–6 months	239	22.11	70.94 ^b	7.60	
	6–12 months	343	31.73	69.13	7.92	
Total		1081	100	70.28	70.28	

Based on Tukey's post hoc test, mean values sharing letter 'b' are not significantly different in the group at the 5% level.
 *P<0.01, **p<0.001.
 ANOVA, analysis of variance; PQoC, perceived quality of care.

and 64 years, and 12.67% being 65 years and older. Of the total study participants, 938 (86.77%) were men, and 1003 (92.78%) were currently married. One-fifth of the study participants (20.91%) attended formal education, and 62.72% had a household size of five or above.

Nearly 90% of the households (87.14%) were active members of the CBHI scheme at the time of the study. A quarter of households (25.72%) had one or more individuals with a known chronic illness informed by a healthcare provider. One-third of respondents (33.58%) rated their household health status as very good, while 207 (19.15%) and 511 (47.27%) rated it as fair and good, respectively. Nearly half of the households (46.16%) had visited a health centre within 3 months prior to the study, while 31.73% and 22.11% had their most recent visit to a health centre before 6–12 and 3–6 months, respectively (table 1).

The median work experience of healthcare providers involved in this study ranges from 3 to 10 years. The mean scores of affective commitment and job satisfaction were 29.00 and 30.95 (SD=2.08 and 3.17), respectively.

The average patient volume was 32.17 per day per care provider, with a range of 19–43 (SD=7.83).

Factor analysis

Sampling was adequate as measured by the KMO (0.83), and Bartlett's test of sphericity was significant ($p<0.001$). Two items were removed from further analysis due to loadings below 0.40, and one item was removed due to low communality. The factor analysis extracted five dimensions that explained 59.25% of the total variation (online supplemental file 1). The item-total score correlations ranged from 0.268 to 0.622, four items had correlations <0.40 . The dimension intercorrelations ranged from 0.031 to 0.434, all of which were less than the 0.80 criterion, indicating that each dimension was distinct enough to be considered an independent measure. Dimension-total score correlation ranged from 0.417 to 0.772, all significant at a p value of 0.001, and are higher than dimension intercorrelations. The scale was tested for reliability and had an overall Cronbach's alpha coefficient of 0.804. The Cronbach's alpha coefficients for the

five dimensions exceeded 0.60, except for the access to care subscale, which had an alpha coefficient of 0.531.

Perceptions of the quality of care

The minimum and maximum PQoC scores were 37.65 and 97.65, respectively. The mean score was 70.28 (95% CI 69.77 to 70.78) with an SD of 8.39. The aggregated mean score at the health centre level ranges from 64.94 to 74.06. Patient-provider communication had the highest mean score ($M=77.84$, $SD=10.12$) of the five quality dimensions, while information provision had the lowest score ($M=64.67$, $SD=13.87$). The mean score for each measurement item is summarised in the online supplemental file 2.

An independent t-test and a one-way ANOVA were performed to compare the mean scores of PQoC and its dimensions between subgroups. As shown in table 1, there was a significant difference in the PQoC mean score for wealth tertile at $p<0.05$ ($F=8.83$, $p=0.001$). Tukey's post hoc test indicated that the mean score of PQoC for the lowest wealth tertile ($M=71.77$, $SD=9.15$) was significantly different from both the medium ($M=69.36$, $SD=8.16$) and highest ($M=69.70$, $SD=7.62$) wealth tertile. However, no significant difference was seen between medium and high wealth tertile. The ANOVA test also showed that the PQoC mean score showed significant differences based on the respondents' perceived health status and time to a recent visit to a health centre, with ($F=8.04$, $p<0.001$) and ($F=4.78$, $p<0.01$), respectively. There was a significant difference in the mean score of PQoC between active insurance members ($M=3.53$, $SD=0.41$) and ex-members ($M=3.38$, $SD=0.48$); $t=3.96$, $p<0.001$. The mean PQoC score of households with chronic illness ($M=3.62$, $SD=0.42$) was also significantly higher compared with those who did not have a chronic illness ($M=3.48$, $SD=0.42$); $t=4.95$, $p<0.001$. The results of an independent t-test and a one-way ANOVA that compare the differences in mean scores of the five dimensions between subgroups are displayed in table 2.

The mean PQoC score was significantly different among health centres ($F=11.85$, $p<0.001$). The mean scores for the five dimensions were also significantly different among health centres at $p<0.001$ level: technical care ($F=8.66$), patient-provider communication ($F=6.65$), information provision ($F=47.42$), access to care ($F=36.87$) and trust in care providers ($F=6.98$). The mean scores of the PQoC and its dimensions across the 12 health centres are depicted using a radar chart (figure 1). The chart shows a comparison of mean scores on a scale of 10–90. For example, respondents from 11 health centres had a higher perception score on patient-provider communication than other dimensions with less variation, while the information provision dimension was mostly ranked lowest with more variability.

Predictors of perceived quality of care: multilevel analysis

The fixed effects (measures of association) and the random effects (measures of variation) for the multilevel

linear regression model are depicted in table 3. In the null model, 8.5% of the total variance in PQoC was attributed to cluster-level variables. The variability between clusters was statistically significant ($\tau=5.90$, $p<0.001$). Furthermore, the null model showed a significant improvement in fit relative to a standard linear model, demonstrating the importance of developing a multilevel model. The cluster-level variation in model II remained significant ($\tau=6.33$, $p<0.001$), with 9.31% of the total variability attributed to differences across clusters. The PCV was negative in this model, indicating that individual-level characteristics did not play a role in explaining the variation between clusters. In model III, cluster-level variables accounted for just 1.33% of the variation in PQoC across clusters. The PCV showed that cluster-level variables explained 85.42% of the variation between health centres, indicating the importance of including cluster-level characteristics to build a more robust explanatory model. We interpreted the results of the regression analysis using model IV, which has the lowest DIC and AIC.

After adjusting for other individual-level and cluster-level factors, the mean PQoC score for households with higher wealth tertile increased by 1.79 points compared with those with lower wealth tertile ($b=1.79$; 95% CI 0.37 to 3.21). Households who were active members of CBHI at the time of the study had a 2.70-point higher PQoC score than ex-members ($b=2.70$; 95% CI 1.25 to 4.14). The PQoC score of households who rated their health status as very good was 1.80 points lower compared with those who rated it as fair ($b=-1.80$; 95% CI -3.31 to -0.29). Compared with households without a chronic illness, those with one or more family members with a chronic illness had a 1.42-point higher perception score ($b=1.42$; 95% CI 0.22 to 2.63). Time to a recent visit to a health centre was also significantly associated with PQoC score. The mean score for households who had their most recent visit to a health centre before 3–6 months was 1.89 points higher compared with those whose recent visit was within 3 months prior to the study ($b=1.89$; 95% CI 0.61 to 3.17).

Regarding cluster-level variables, the average work experience of healthcare providers and patient volume had statistically significant associations with PQoC. A 1.07-point improvement in the average PQoC score of health centres was noted for every year's increase in the median work experience of healthcare providers ($b=1.07$; 95% CI 0.74 to 1.40). An interaction term between patient volume and job satisfaction was positively associated with PQoC, implying that improving staff job satisfaction would buffer or lessen the effect between patient volume and PQoC. At an average staff job satisfaction, a 0.42-point drop in the average PQoC score of health centres was observed for a unit increase in patient volume ($b=-0.42$; 95% CI -0.50 to -0.33). A one-unit increase in patient volume would only result in a 26% fall in average PQoC if the average job satisfaction is set 1 SD above the mean. This prediction was substantiated by the fact that the margins graph for patient volume showed the flattest slope for higher

Table 2 Independent t-test and one-way ANOVA comparing mean scores of PQoC dimensions (20–100 scale) across respondent characteristics in two districts of northeast Ethiopia, 2021

Variables	N	Technical care		Communication		Information provision		Access to care		Trust in providers	
		M	SD	M	SD	M	SD	M	SD	M	SD
Age (years)											
25–44	389	68.33	15.61	77.60	9.89	62.75 ^b	13.73	69.99	11.64	73.59 ^b	10.11
45–64	555	68.14	15.19	77.71	10.01	64.60 ^b	14.03	69.41	12.04	73.61 ^b	10.96
65+	137	69.15	14.44	79.03	11.19	70.36 ^{***}	12.09	68.25	10.97	70.46 ^{**}	13.21
Gender											
Men	938	68.36	15.15	77.67	10.17	64.40	13.80	69.34	11.67	73.18	10.80
Women	143	68.48	16.00	78.93	9.81	66.40	14.27	70.31	12.42	73.38	12.37
Marital status											
Divorced/Widowed	78	70.77	14.74	78.80	12.10	70.77 ^{***}	13.58	67.18	13.03	72.31	14.01
Married	1003	68.15	15.27	77.76	9.96	64.19	13.79	69.65	11.65	73.27	10.75
Formal education											
No	855	68.37	15.41	77.78	10.29	64.43	13.98	69.63	11.64	73.39	11.13
Yes	226	68.20	14.62	78.05	9.54	65.55	13.46	68.89	12.24	72.51	10.56
Household size											
<Five	403	69.10	15.21	78.51	10.07	65.14	14.31	70.37	11.25	73.18	11.94
≥Five	678	67.89	15.25	77.43	10.14	64.39	13.61	68.94	12.04	73.22	10.44
Wealth tertile											
Lowest	361	69.64	14.42	79.56 ^{***}	9.94	70.21 ^{*** a}	12.84	68.70	11.49	72.13 ^a	13.07
Medium	360	67.11	15.28	76.80 ^b	10.57	63.08 ^a	14.40	69.00	11.82	73.02 [*]	10.45
Highest	360	68.26	15.93	77.13 ^b	9.65	60.69 ^a	12.54	70.63	11.94	74.46 ^a	9.04
Insurance status											
Ex-member	139	64.75 ^{**}	15.73	74.29 ^{**}	12.91	63.13	14.46	67.05 ^{**}	13.56	70.79 ^{**}	13.07
Active member	942	68.87	15.10	78.36	9.54	64.89	13.78	69.83	11.44	73.56	10.64
Self-rated health											
Fair	207	71.76 ^b	13.73	80.35 ^{***}	9.55	70.02 ^{***}	12.87	68.62	11.51	72.59 [*]	11.83
Good	511	68.85 ^b	14.73	76.73 ^b	10.06	63.86 ^b	13.95	69.18	11.14	74.16 ^a	9.83
Very good	363	65.67 ^{***}	16.31	77.96 ^b	10.29	62.74 ^b	13.59	70.37	12.71	72.21 ^a	11.99
Chronic illness											
No	803	67.39 ^{***}	15.58	77.30 ^{**}	10.35	63.09 ^{***}	13.74	69.13	11.90	73.07	10.94
Yes	278	71.08	13.90	79.38	9.29	69.21	13.26	70.47	11.33	73.60	11.25
Last health centre visit											
<3 months	499	68.08	15.10	78.46	10.25	68.07 ^{***}	13.95	68.88 ^b	11.49	71.77 ^{***}	12.20
3–6 months	239	69.71	14.79	77.68	9.97	62.97 ^b	12.90	71.67 ^{***}	11.28	75.06 ^b	9.31
6–12 months	343	67.76	15.74	77.03	10.02	60.90 ^b	13.26	68.80 ^b	12.34	73.99 ^b	10.01
Total	1081	68.34	15.24	77.84	10.12	64.67	13.87	69.47	11.77	73.20	11.02

Based on Tukey's post hoc test, mean values sharing letter 'a' are significantly different; while mean values sharing letter 'b' are not significantly different in the group at the 5% level. * $P < 0.05$, ** $p < 0.01$, *** $p < 0.001$. ANOVA, analysis of variance; PQoC, perceived quality of care.

job satisfaction. However, the buffering role is observed in health centres with an average patient volume of 30.75 or higher.

DISCUSSIONS

Individuals with health insurance will continue to be members if they believe they are receiving the highest possible quality of healthcare.^{19 20} In this study, the mean PQoC score was 70.28 on a scale of 20–100 with an SD of 8.39. The patient-provider communication received

the highest score ($M=77.84$, $SD=10.12$) among the five quality dimensions. In 2015, the Ethiopian government incorporated the development of caring, respectful and compassionate healthcare providers as one of the main transformation agendas in its 5-year health sector strategic plan, and movements were created around it.²⁷ Our finding may be attributed partly to the government's ongoing training initiatives aimed at producing healthcare providers who are competent in this aspect. The perception score for the information provision dimension, on

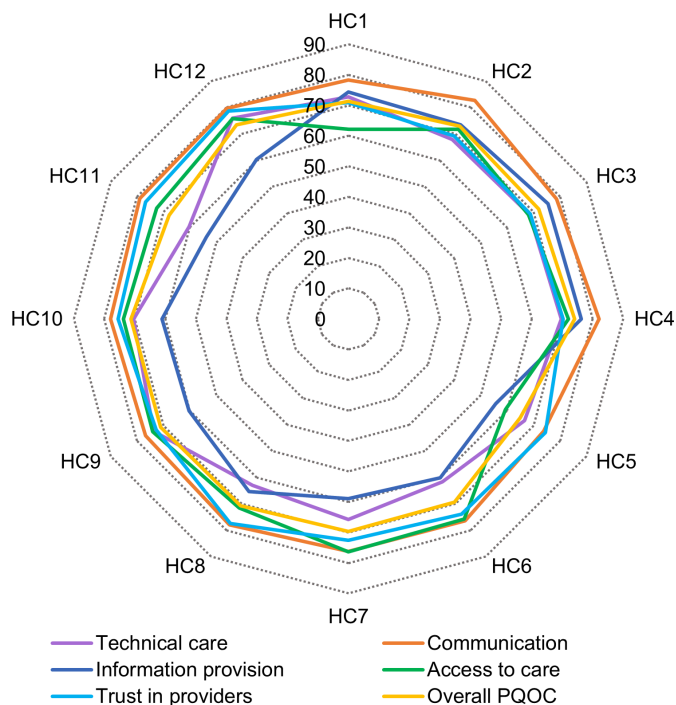


Figure 1 Summary of the mean scores of the perceived quality of care (PQoC) and its dimensions across 12 health centres (HC) in two districts of northeast Ethiopia, 2021.

the other hand, was the lowest ($M=64.67$, $SD=13.87$). This could be attributed to an increase in patient volume following the implementation of CBHI.²⁶ Items loaded under this dimension appear less practical in the presence of a larger patient load. If healthcare providers are required to treat a large number of patients, consultation times will be reduced. They are unlikely to provide the necessary information to their clients if they are under time constraints. Regarding item-level observations, waiting time and medicine availability received the lowest perception scores (62.96 and 63.50, respectively), which could also be related to increased patient load. This is in line with earlier studies in Ethiopia, which revealed that clients with health insurance frequently complain about a lack of medicine and long wait times at CBHI-affiliated health facilities.^{43 44}

Results of the regression analysis revealed that households with higher wealth tertile had a higher PQoC score than those with lower wealth tertile. This is in contrast to other studies whereby the richest group had a lower perception score.^{16 45} This discrepancy could be partly attributed to the use of different metrics to assess the quality of care. People with higher economic status may be more aware of health issues and able to bargain with healthcare providers to obtain the best possible care. Furthermore, if prescribed medicines are not available in CBHI-affiliated health facilities, for instance, they can afford to buy from private pharmacies. On the contrary, it may be irritating for people with lower economic status to buy medicines with limited money or to forgo treatment due to lack of money. In this regard, they may develop a negative perception of the quality of care.

Households who were active members of CBHI at the time of the study had a higher rating of PQoC compared with ex-members. Contrary to our finding, a study in Ghana showed that previously insured clients had a higher perception of quality of care compared with actively insured clients (statistical significance is not reported). The authors argue this was due to the more time-consuming nature of the service delivery processes for insured clients.⁴⁶ At least three possible explanations exist for the relationship between CBHI status and PQoC. First, because they do not have to pay for healthcare, active members have better access to and enjoyment of its benefits, resulting in a favourable perception of its quality. Second, the relationship could be due to an endogeneity issue created by omitted variables. It is plausible that higher quality score reported by active members is due to such variables, as the desire to continue their membership. Third, ex-members of CBHI may have had negative experiences with health services, which led to the decision to discontinue their membership. As a result, they would be critical in rating the quality of care provided. In support of the latter argument, it was evidenced that poor quality of care was a major reason for insurance members to leave the scheme.^{24 47} Elsewhere, a statistically significant association was also reported between dropout and low quality of care.^{48 49}

This study verified that the PQoC score of households who rated their health status as very good was significantly lower compared with those who rated it as fair. The households' chronic illness experiences also influence the PQoC rating. The PQoC score of households with a chronic illness was higher compared with those without a chronic illness. This may be true for people who perceive their health as fair or who live with chronic conditions to appreciate the gains or benefits of the healthcare they received. In this respect, they may be more likely to rate the quality of care higher than their counterparts.

The results also indicated that households who had their most recent visit to a health centre before 3–6 months had higher PQoC scores compared with those whose recent visit was within 3 months prior to the study. Patients may experience varying levels of emotional highs and lows, depending on the length of the most recent facility visit. Although patients' perceptions of quality may develop over time,⁵ patients who recently visited a health facility may be more critical of the quality of care due to strong emotions attached to negative events or health services that fall short of their expectations.

Our findings revealed that the average work experience of healthcare providers was positively associated with PQoC. Work experience is linked to task specialisation, which can lead to a faster work pace, more output in less time and higher quality. Providers with more experience take less time to make diagnoses and treatment decisions, while still providing recommended practical aspects of care, such as good communication, physical examination and provision of relevant health information.⁵⁰ As a result, they can reduce waiting times, and their management

Table 3 Multilevel linear regression analysis of factors associated with PQoC among households ever enrolled in a CBHI scheme in two districts of northeast Ethiopia, 2021

Variables	Category	Model I	Model II b (95% CI)	Model III b (95% CI)	Model IV b (95% CI)
Fixed effects					
Age			-0.02 (-0.06 to 0.03)		-0.03 (-0.07 to 0.02)
Gender	Women		0.64 (-1.06 to 2.34)		0.80 (-0.88 to 2.49)
Marital status	Married		-0.14 (-2.42 to 2.15)		0.18 (-2.09 to 2.45)
Modern education	Yes		-0.07 (-1.34 to 1.19)		-0.25 (-1.49 to 1.00)
Wealth tertile	Medium		-0.57 (-1.89 to 0.74)		-0.16 (-1.40 to 1.09)
	High		0.73 (-0.87 to 2.34)		1.79 (0.37 to 3.21)*
Household size	Large (≥5)		-0.28 (-1.28 to 0.72)		-0.31 (-1.31 to 0.68)
Insurance status	Active member		2.65 (1.20 to 4.11)***		2.70 (1.25 to 4.14)***
Perceived health status	Good		-0.75 (-2.16 to 0.66)		-0.73 (-2.14 to 0.67)
	Very good		-1.78 (-3.29 to 0.26)*		-1.80 (-3.31 to 0.29)*
Chronic illness	Yes		1.55 (0.34 to 2.76)*		1.42 (0.22 to 2.63)*
Last health centre visit	3–6 months		1.64 (0.35 to 2.94)*		1.89 (0.61 to 3.17)**
	6–12 months		0.77 (-0.45 to 1.99)		1.02 (-0.18 to 2.21)
Work experience				0.75 (0.33 to 1.17)**	1.07 (0.74 to 1.40)***
Affective commitment				0.48 (0.04 to 1.00)	0.27 (-0.10 to 0.65)
Patient volume				-0.33 (-0.45 to 0.21)***	-0.42 (-0.50 to 0.33)***
Job satisfaction				0.01 (-0.24 to 0.27)	0.07 (-0.10 to 0.24)
Patient volume×job satisfaction				0.06 (0.02 to 0.11)**	0.05 (0.02 to 0.08)**
Random effect					
τ (SE)		5.90 (2.78)***	6.33 (3.10)***	0.86 (0.94)	≈0.00
ICC (%)		8.50	9.31	1.33	≈0.00
PCV (%)		Reference	-7.29	85.42	≈100
Model fitness					
DIC		7578.01	7528.89	7572.79	7516.90
AIC		7584.01	7560.89	7588.79	7558.90

*P<0.05, **p<0.01, ***p<0.001.

AIC, Akaike Information Criterion; b, regression coefficient; CBHI, community-based health insurance; DIC, Deviance Information Criterion; ICC, intraclass correlation; PCV, proportional change in variance; PQoC, perceived quality of care; τ, cluster-level variance.

outcomes may be more effective than inexperienced providers. This could be more pronounced in Ethiopia where there has been a sharp rise in outpatient visits to CBHI-affiliated health centres.²⁶

Conditional to the average staff job satisfaction, patient volume is negatively correlated with PQoC. A study in Ethiopia identified a non-linear significant association (an inverted U-shape) between patient volume and quality. Quality decreased with increasing patient volume in health facilities that treated 90.6 or more patients per day, while quality increased with increasing patient volume in health facilities that treated fewer than 90.6 patients per day in the outpatient departments.⁵¹ Our finding is consistent with a study at public hospitals in China where overcrowding was negatively associated with clients' perception of quality of care.³¹ The apparent correlation between patient volume and PQoC could

be explained by factors such as increased demand for healthcare providers and longer wait times. An increased patient volume would put a great deal of pressure on healthcare providers to treat a large number of patients in a short time. This may result in shorter consultation time and the omission of important practical aspects of care. On top of that, an increase in patient volume would mean longer waiting times at various service delivery points. Both these factors could have contributed to a negative patient experience and influenced their perception of overall quality of care. Some studies reported a positive relationship between patient volume and quality of basic maternal care, and postoperative infections.^{52 53} The alternative direction of this relationship, in which quality drives patient volume, is based on the assumption that the provision of high-quality care will attract more patients. This may be true in areas where patients have



access to competitive health facilities, and healthcare providers are incentivised for providing higher quality care. This is not the case in low-income countries, like Ethiopia, where healthcare facilities are hard to reach for most rural populations. Members of CBHI are further limited to using health services only in public health facilities affiliated with the scheme.

This study found no significant association between staff job satisfaction and PQoC. This contrasts with the findings of Kvist *et al*, which reported a positive relationship between job satisfaction among the nursing staff and patients' perceptions of quality of care.⁵⁴ Despite this, it moderates the relationship between patient volume and PQoC in a non-linear fashion. Improved job satisfaction buffers the negative relationship between patient volume and PQoC in health centres with an average patient volume of 30.75 or higher. When the average patient volume is <30.75, however, improving job satisfaction enhances the effect between patient volume and PQoC. The buffering role of service providers' job satisfaction at higher patient volume may indicate that job satisfaction is the result of intrinsic rewards for higher work performance. Providers may also be fully available during working hours at the health facility due to the increased number of clients. On the other hand, the moderating role in enhancing the relationship at lower patient volume may suggest that a low workload is one source of job satisfaction. Because clients are in small numbers, providers may not be fully engaged during working hours. They may have the freedom to do other businesses outside the health facility, leaving patients unattended and dissatisfied.

The findings of this study will be an essential input for quality improvement initiatives as well as addressing challenges in the country's efforts to establish higher-level insurance pools. This is the first study of its kind to consider cluster-level variables associated with PQoC in Ethiopia. It gives an important lesson to healthcare managers and other relevant stakeholders to consider cluster-level characteristics in healthcare quality improvement efforts. It also pointed out quality dimensions that require special consideration in managerial decisions. Despite the significant findings of the current study, some caution should be taken in interpreting the findings. One noteworthy limitation of this study is the use of relatively small cluster sample size. In this study, only 12 health centres (level 2 units) were included to assess the role of cluster-level variables on the outcome variable. Concerns have been raised about the accuracy of estimates in multilevel modelling when there is small number of clusters. However, we employed the restricted maximum likelihood estimation method, which could substantially improve the accuracy of estimates.⁴⁰ Second, due to the cross-sectional nature of the data, the analysis was conducted to identify associations rather than prove causation. Third, the association between current insurance status and PQoC could be due to the possibility of endogeneity. Fourth, patient volume data based on secondary data may not reflect the

true figure due to the possibility of under-reporting or over-reporting.

CONCLUSIONS

Despite encouraging findings on patient-provider communication, much work remains to be done to improve information provision and access to care quality dimensions. According to the findings, people's perceptions of quality of care varied depending on a variety of individual-level and cluster-level factors. The household's wealth status, current insurance membership, perceived health status, presence of chronic illness in the household and time to a recent visit to a health centre were individual-level predictors of PQoC. At the cluster level, patient volume and work experience of healthcare providers were associated with PQoC. A lower patient volume allows the healthcare provider to devote more time and attention to each patient, address the individual patient's needs and have more time to improve communication with and provide behaviour change counselling, which has an impact on the quality of care.⁵⁵ Therefore, to ensure that patients have access to a better quality of care, it is critical to determine an appropriate patient volume per care provider. Staff job satisfaction was an important factor that buffers the effect between patient volume and PQoC. Hence, it is vital to devise mechanisms to improve staff job satisfaction, especially in health facilities with higher patient volumes. More importantly, health centres should go to great lengths to ensure that every patient has access to the necessary medications. This will boost clients' trust in healthcare providers, which will be critical for health insurance schemes to retain and attract members.

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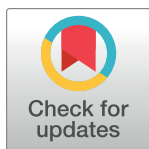
RESEARCH ARTICLE

A mixed methods study of community-based health insurance enrollment trends and underlying challenges in two districts of northeast Ethiopia: A proxy for its sustainability

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Abstract

Background

The term "community-based health insurance" refers to a broad range of nonprofit, prepaid health financing models designed to meet the health financing needs of disadvantaged populations, particularly those in the rural and informal sectors. Due to their voluntary nature, such initiatives suffer from persistently low coverage in low- and middle-income countries. In Ethiopia, the schemes' membership growth has not been well investigated so far. This study sought to examine the scheme's enrollment trend over a five-year period, and to explore the various challenges that underpin membership growth from the perspectives of various key stakeholders.

Methods

The study employed a mixed methods case study in two purposively selected districts of northeast Ethiopia: Tehulederie and Kallu. By reviewing the databases of health insurance schemes, quantitative data were collected retrospectively from 2017 to 2021 to examine enrollment trends. Trends for each performance indicator were analyzed descriptively for the period under study. Face-to-face interviews were conducted with nine community members and 19 key informants. Study participants were purposely selected using the maximum variation technique. Interviews were audio recorded, transcribed verbatim, and translated into English. Thematic analysis was employed with both deductive and inductive coding approaches.

Results

Over the course of the study period, enrollment in the scheme at both districts exhibited non-linear trends with both positive and negative growth rates being identified. Overall, the

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scheme in Tehulederie has a relatively higher population coverage and better membership retention, which could be due to the strong foundation laid by a rigorous public awareness campaign and technical support during the pilot phase. The challenges contributing to the observed level of performance have been summarized under four main themes that include quality of health care, claims reimbursement for insurance holders, governance practices, and community awareness and acceptability.

Conclusions

The scheme experienced negative growth ratios in both districts, indicating that it is not functionally viable. It will fail to meet its mission unless relevant stakeholders at all levels of government demonstrate political will and commitment to its implementation, as well as advocate for the community. Interventions should target on the highlighted challenges in order to boost membership growth and ensure the scheme's viability.

Introduction

Out-of-pocket (OOP) payment is the main source of health care financing in low- and middle-income countries [1, 2]. Millions of people were unable to seek health care because it must be paid for at the time of use [3, 4]. It is also a signal that people are more likely to face financial hardships as a result of receiving health care [5]. To achieve universal health coverage (UHC), a strong commitment is required to shift from an OOP payment model to a prepaid, pooling strategy that expands access to essential care while spreading the financial risks of illnesses across the population [3, 4]. In this regard, community-based health insurance (CBHI) has got a prominent place in low- and middle-income countries. CBHI is a generic term that covers a variety of nonprofit health financing schemes initiated by communities, providers, enterprises, and others to meet the health care financing needs of disadvantaged populations especially in the rural and informal sectors [6, 7]. In theory, all CBHI schemes share common characteristics including solidarity, where risk sharing is as inclusive as possible and membership premiums are independent of individual health risks; community-based social dynamics, where the schemes are organized by and for individuals who have predominantly low income, earning a subsistence from the informal sector, or are socially excluded and share common characteristics; participatory decision-making where members are actively involved in driving the design and management of the scheme; nonprofit character; and voluntary affiliation [8–10].

CBHI is appropriate for subsistence farmers and workers in the informal sector, because they are typically not covered by payroll-based social health insurance programs in many countries [9]. It has been adopted in a growing number of sub-Saharan African countries, including Ethiopia, as part of the effort to meet the health care needs of informally employed and low-income people, which make up the majority of the population [1, 8]. The sustainability of a voluntary CBHI scheme relies to a greater extent on the ability of implementers to attract and retain members [11]. The key performance indicators for measuring membership development are growth ratio, coverage ratio, and renewal ratio [11, 12].

A large membership base enhances economies of scale, risk pooling, and reduced vulnerability to unforeseen events. It allows for the retention of healthy members while avoiding adverse selection, resulting in higher revenue, lower marginal costs, and lower health care spending [11]. In the event of decreasing coverage, members who remain in the scheme are more likely to be chronically ill and in high-risk age groups. This leads to higher claims costs, jeopardizing the schemes' financial viability [11–13].

With the exception of a few success stories, CBHI initiatives in low- and middle-income countries are plagued by persistently low coverage due to their voluntary orientation [8, 14]. A review of studies in four sub-Saharan African countries showed that the existence of a large informal sector whose members are mostly uninsured, and a high dropout rate, were among the main challenges facing CBHI schemes to sustain and achieve the goal of UHC [15]. Earlier studies have identified a variety of challenges that contribute to low membership coverage. The most prominent challenge is poor quality of health care [16–20]. Other plausible reasons include the lack of awareness of the risk-sharing principle and the benefits of insurance plans [21–24], claims rejections [25], and members' lack of trust in the scheme's integrity [24, 26].

It is essential to generate empirical evidence on the success of CBHI schemes for overcoming existing barriers as well as initiating structural and design changes [27]. In Ethiopia, several studies have been conducted on enrollment [28–33] and membership renewal decisions [34–36]. However, none of these explored the different issues related to membership development from the perspectives of various stakeholders. A qualitative study examined the barriers and facilitators of membership growth; however, it was solely based on community members' perspectives [24]. Therefore, the current study sought to examine the scheme's enrollment trend over a five-year period from 2017 to 2021, and to explore the challenges that underpin membership growth from the perspectives of various key stakeholders using mixed methods research.

Based on lessons learned from previous implementations, Ethiopia's current health care finance strategy aims to establish a unified pool system at a national level that allows cross-subsidy between high-risk and low-risk areas [37]. The findings of this study will be valuable to policymakers and other relevant stakeholders to overcome implementation challenges and develop membership attraction and retention strategies in an effort to establish the proposed higher-level pools.

A brief overview of CBHI in Ethiopia

Since July 2011, Ethiopia is implementing a CBHI scheme to meet the health care needs of rural households that constitute an estimated 85% of the country's population. The scheme was launched in 13 pilot districts in four regional states as part of the health care financing reform aimed at reaching the goal of UHC [25]. Based on the evaluation findings of the pilot initiative, the scheme was first expanded to 161 districts in July 2013, and then to 827 districts as of July 2020 with a total enrollment coverage of 50% [38].

The government is in charge of CBHI, with an active participation of the community in its design and implementation. Membership is voluntary and must be renewed annually. To reduce adverse selection, the membership unit was set at a household level [25, 39].

The scheme's primary sources of revenue are government subsidies, premiums, and registration fees. The federal government provides 25% of annual enrollment contributions to the scheme as a general subsidy. In addition, regional and district governments provide a targeted subsidy to cover the costs of fee waivers for 10% of the target population who are indigent. Premiums are set at the household level based on core family members (a mother, father, and their children under the age of 18) and additional annual premiums must be paid for each non-core family member. Regional states have the authority to update the premium based on local circumstances [25, 39]. For instance, the initial yearly premium in the Amhara Regional State, where this study is conducted, was 8.34 USD regardless of family size [25]. Eventually it was changed to varying levels of contributions dependent on family size. At the time of the study, the annual premium in rural areas ranged from 8.89 USD to 12.19 USD with 2.54 USD for each non-core family member [40].

The benefit packages cover all outpatient and inpatient services at health centers and hospitals within Ethiopia, with the exception of cosmetic treatments, organ transplants, chronic renal dialysis, treatment for exempted services, and non-generic medicines [25, 39, 40]. Specific to the Amhara Regional State, members must follow the referral path in order to obtain free health care via the CBHI. The scheme will not cover treatment costs if individuals bypass health centers and seek care from hospitals without a referral letter. The service providers for scheme cardholders are public health facilities. All health services and medicines covered by the benefit packages are provided to scheme members free of charge at CBHI affiliated health facilities. Scheme members can only claim reimbursements for expenses made at private institutions for services or medicines that are not available in contracted health facilities as long as they follow the formal procedure and submit the necessary paperwork [40].

Materials and methods

Study setting

The study took place in two rural districts of northeast Ethiopia: Tehulederie and Kallu. Tehulederie is divided into 20 rural and seven urban *Kebeles* (subdistricts) with a population of 145,625, of which 87.5% are residing in rural areas. The district has five health centers and one primary hospital. Kallu is divided into 36 rural and four urban *Kebeles*, with nine health centers. It is the most populous district in the zone, with a population of 234,624, with 89.11% residing in rural areas [41]. For the vast majority of the population in the study area, agriculture is the primary source of income.

Tehulederies was one of the CBHI pilot districts in Ethiopia, which began implementing the initiative in July 2011. Two years later, the scheme was launched in Kallu, in July 2013. The district-level scheme is part of the health sector and is governed by the health insurance board. The board signs a contract with public health facilities annually, and reimbursements are made at the end of every three months based on a fee-for-service payment approach. Health facilities must receive payments within two weeks after filing their claims. The scheme conducts a medical audit before reimbursing them, and it is likely that claims will be deducted based on the audit findings. The scheme also reimburses insurance holders for OOP expenses made in private institutions as long as they follow the right procedure. At a *Kebele* level, the key players for membership enrollment, renewal, and premium collection are *Kebele* leaders and health extension workers (HEWs). One of the HEWs' responsibilities as community health workers is to persuade people for enrollment.

Study design

The study employed a mixed methods case study with both quantitative and qualitative data collected simultaneously. Mixed methods research is an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and organizes these procedures into specific research designs [42]. We applied a qualitatively driven, concurrent nested design in which the quantitative component was embedded within the primary qualitative study to answer a complementary question [43]. The aim of the quantitative part was to assess the performance of the CBHI scheme in terms of membership development using key measurement indicators while the qualitative part was intended to explore the underlying challenges that impede membership development efforts. Thus, the driving motive for combining the two approaches in this study is the belief that both kinds of research have value, that they generate different but complementary data which offer a holistic view of the scheme's membership development.

Results from both the quantitative and qualitative components are presented separately, and the two components are integrated at data interpretation stage. The findings from the qualitative and quantitative components are discussed, and connections are made between the various challenges explored through the qualitative interviews and the level of performance observed in terms of membership development.

Participant selection

The study approach considered each of the two districts as a separate case study of the scheme's performance. We used purposive sampling to select the two study districts. Tehulederie was the sole early adopter of the scheme in the zone, serving as a pilot district, hence selected as an outlier case. The second case (Kallu), was selected as a typical case since it is the zone's largest district that shares a variety of geographical features with other districts. Outlier sampling or deviant case sampling involves selecting cases that are information rich, because they are unusual or special in some way, while typical case sampling involves selecting and studying cases that are average to understand, illustrate, and highlight what is typical and normal [44].

Qualitative interview participants in both study sites were purposely selected using the maximum variation technique in order to gain insight from a diverse range of viewpoints and to chronicle important shared experiences that cut across the various stakeholders participating in the CBHI scheme implementation [44]. Key informants were selected among stakeholders based on their active participation in the scheme's implementation and their ability to provide a wealth of data. A total of 19 key informants (eight in Tehulederie and 11 in Kallu) were recruited by considering the different sectors, that included two scheme personnel, one district health officer, four health center directors, five health care providers, three *Kebele* leaders and four HEWs. Two of the key informants were coworkers of the lead investigator as health care providers in one of the study districts. Nine community members (five in Tehulederie and four in Kallu) were selected by HEWs for in-depth interviews based on their insurance status (current and previous members), and their ability to provide useful information. HEWs are familiar with the population in rural *kebeles* because their main responsibility is to provide home-based health services and mobilize the community for health insurance. The final sample size at each study district was determined based on data saturation, with no new information emerging from participants [45]. Individuals with similar characteristics to the formal interviewees at district health offices, health facilities and in the community were also invited for informal interviews based on the relevance of the information they provided during informal interactions.

Data collection

The data was collected between February 8 and May 2, 2021. Quantitative data was gathered by reviewing the databases of the two CBHI schemes retrospectively using checklists developed based on key performance indicators. Data on the eligible target population, the number of new enrollees, and expected as well as actual renewals were collected for each enrollment period under consideration. Although we intended to examine all years of the scheme's implementation (10 years in Tehulederie since 2011 and seven years in Kallu since 2013), we were only able to get complete data from 2017 to 2021.

Qualitative data were collected using key informant interviews (KII), in-depth interviews (IDI), and informal field interviews (IFI) [44]. The IDI was conducted with current and previous members of the CBHI to explore their views and experiences concerning health care quality, community willingness to participate in the scheme, claim benefits, and scheme services.

The IDIs were conducted at health posts (HEW's office). The KIIs intend to explore the views of different stakeholders regarding community understanding and acceptability of the CBHI, health care quality, and claims management. Key informants were interviewed at their offices based on a pre-specified schedule. Informal interviews were also made during our visits to the district health offices, health facilities and households to capture important information that could triangulate with the formal interviews. Informal interviews are those that are conducted either with a single participant in natural conversation or with some small group of people, asking normal, conversational questions during periods of informal interaction [44].

All the formal interviews were conducted face-to-face by the lead investigator in convenient locations using an interview guide that was designed to elicit the participants' views via open-ended questions which were further probed to trigger more discussions. Interviews were conducted in Amharic, the local language, and lasted between 10 and 40 minutes. All the formal conversations were audio recorded using a digital voice recorder with the permission of the participants. Field notes were taken during informal interviews. Every person we approached agreed to take part in the study.

Data analysis

Quantitative data obtained through document review were analyzed using the performance indicators selected for this study, which include membership growth ratio, coverage ratio, and renewal ratio. The coverage ratio is the proportion of the target population who are insured, whereas the renewal ratio is the proportion of insured households who renewed their subscription during the current period among those eligible to renew. The growth ratio is a combination of coverage and renewal ratios that measures the proportion of the number of insured people who have increased or decreased over time [11, 12]. The target population in this study refers to the estimated total population in the study area who are eligible for CBHI membership, which include farmers and those working in the informal sector. Those illegible for renewal refer the number of potential renewals (the number of clients that could have renewed their coverage) [12]. The trends of each indicator over the study period were analyzed using Microsoft Excel.

Audio records from the qualitative interviews were transcribed verbatim, and then translated into English. Field notes were made part of the transcription. Thematic analysis was done based on the finalized translated data. The Atlas.ti 9 software package was used to facilitate the coding process. To begin, all the interview transcripts were read and reread to have a thorough understanding of the data set. Both deductive and inductive approaches were used in the coding process. The deductive approach was used as the starting point by defining preliminary themes and sub-themes based on the research questions and a review of existing literature. Themes that emerged during the coding process were added inductively, rather than trying to fit them into a preexisting coding framework. The lead investigator generated initial coding schemes and categorized the codes into subthemes and themes independently. The preliminary results were reviewed by the coauthors and agreements were reached through ongoing discussions.

We used different approaches to enhance trustworthiness of the data, including data triangulation, thick description, and reflexivity. The different data collection methods and data sources (method and source triangulation) could increase the credibility of the findings [46]. To foster reflexivity, the principal investigator kept a reflexive journal to record expectations, feelings, observations, interview experiences, choices available, and decisions made throughout the research process [42]. A rich, thick description of the research setting, process, and findings was made to enhance its understanding and transferability. We provide a detailed account

of the findings, which was backed up by adequate evidence in the form of quotes from participant interviews [45].

Ethical considerations

Ethical approval was obtained from the Institutional Review Board of the College of Medicine and Health Science, Bahir Dar University, before commencing the study. A support letter was communicated to the district health offices to gain entry permission into the study areas. Each of the study participants gave their verbal informed consent. Consent was obtained on the use of a voice recorder during interviews. Confidentiality was assured through collecting anonymous information and informing the participants that personal identifiers would not be revealed to a third party.

Results

Enrollment trends in the scheme

Over the period under study, the number of insured households ranged between 11,535 and 14,188 in Tehulederie and 12,175 to 27,859 in Kallu, with an estimated target population of 22,216 and 45,876, respectively. The coverage ratio in the 2021 enrollment period was 65.5% in Tehulederie and 58.5% in Kallu.

The five-year enrollment trend of the scheme in both districts is displayed under Table 1. In Tehulederie district health insurance scheme, population coverage dropped from 65.7% in 2017 to 62.9% in 2018 and to 51.3% in 2019. It increased back to 60.2% in 2020 and to 65.5% in 2021. In 2018 and 2019, a negative growth ratio of 1.3% and 17.6% was observed, while a positive growth ratio of 18.3% and 3.7% was recorded in 2020 and 2021, respectively. The renewal ratio ranged from 76.7% in 2019 to 96.6% in the 2021 renewal period.

The population coverage in Kallu district health insurance scheme was 27.2% in 2017. It increased to 57.9% in 2018 and dropped back to 50.3% in 2019. A 60% and 58.5% coverage were reached in 2020 and 2021, respectively. The growth ratio did not show a linear increase or decrease during the period under study. A positive growth ratio of 116.3% and 19.8% was observed in 2018 and 2020, while a negative growth ratio of 11.7% and 2.5% was achieved in 2019 and 2021, respectively. The renewal ratio ranged from 37% in 2017 to 68.3% in the 2018 registration period. Fig 1 depicts the enrolment trend of the two schemes over a five-year period.

Challenges to membership development

While each case study site is assessed as a unique implementation of the CBHI, integrating findings from the two case studies allows for the identification of key common themes. Four main themes were identified, which are quality of health care, claims reimbursement for

Table 1. Coverage, renewal and growth ratios of CBHI membership (2017–2021) at two case study districts of northeast Ethiopia.

Year	Tehulederie			Kallu		
	Coverage ratio (%)	Renewal ratio (%)	Growth ratio (%)	Coverage ratio (%)	Renewal ratio (%)	Growth ratio (%)
2017	65.7	89.9	-	27.2	37.0	-
2018	62.9	94.3	-1.3	57.9	68.3	116.3
2019	51.3	76.7	-17.6	50.3	56.8	-11.7
2020	60.2	80.5	18.3	60.0	63.6	19.8
2021	65.5	96.6	3.7	58.5	62.6	-2.5

<https://doi.org/10.1371/journal.pone.0266583.t001>

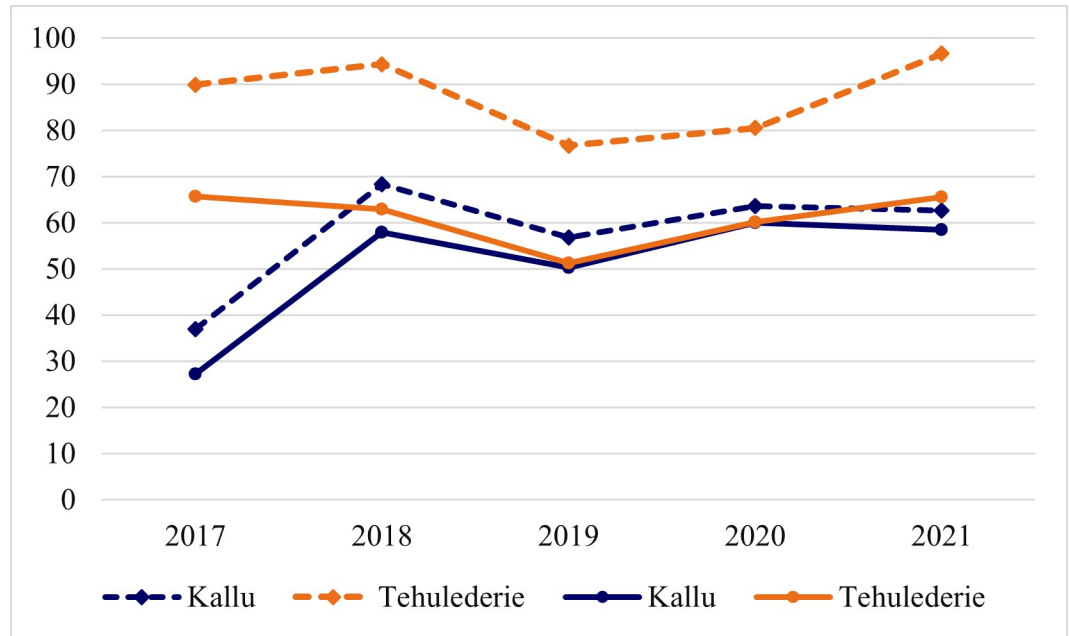


Fig 1. Trends in community-based health insurance enrollment in two case study districts of northeast Ethiopia between 2017 to 2021. Note: Solid lines represent coverage ratios while broken lines represent renewal ratios, both in percentages.

<https://doi.org/10.1371/journal.pone.0266583.g001>

insurance holders, governance practices, and community awareness and acceptability of the CBHI (Fig 2). Similar sub-themes are categorized and described under each main theme.

Quality of health care

Availability and perceived quality of medicines. Unavailability of medicines was the most frequently discussed issue in all interviews. Due to the unavailability of medicines in contracted health centers and hospitals, insured patients were usually given prescriptions to buy from private pharmacies, and forced to make OOP spending or forgo treatment if they were not able to afford its cost. In addition to health service users, health care providers and health center directors from both districts were well aware of the depth of this problem. The two main reasons for medicine stock outs at health centers were a lack of budget and limited capacity of the government's pharmaceutical supply agency. Especially, key informants emphasized the pharmaceutical supply agency's limited capacity to meet the demands of health facilities in its catchment area. Because the government's supplier agency frequently runs out of medical supplies, health facilities have been compelled to procure from private vendors, which requires a lengthy process and higher price markups.

"The biggest problem now is that there is a shortage of medicines in all health centers that provide services to insured patients, and most patients have to purchase their medications from private pharmacies at a higher cost." (KII-5, health center director)

In addition to the lack of medicine availability, IDI participants believe that medicines provided at health centers are of poor quality. The majority of insured patients fail to take their prescribed medications as directed, which may be due to a lack of faith in their quality. Health care providers disagreed that this was the community's judgment based on their preferences, expectations, and level of awareness regarding medicines.

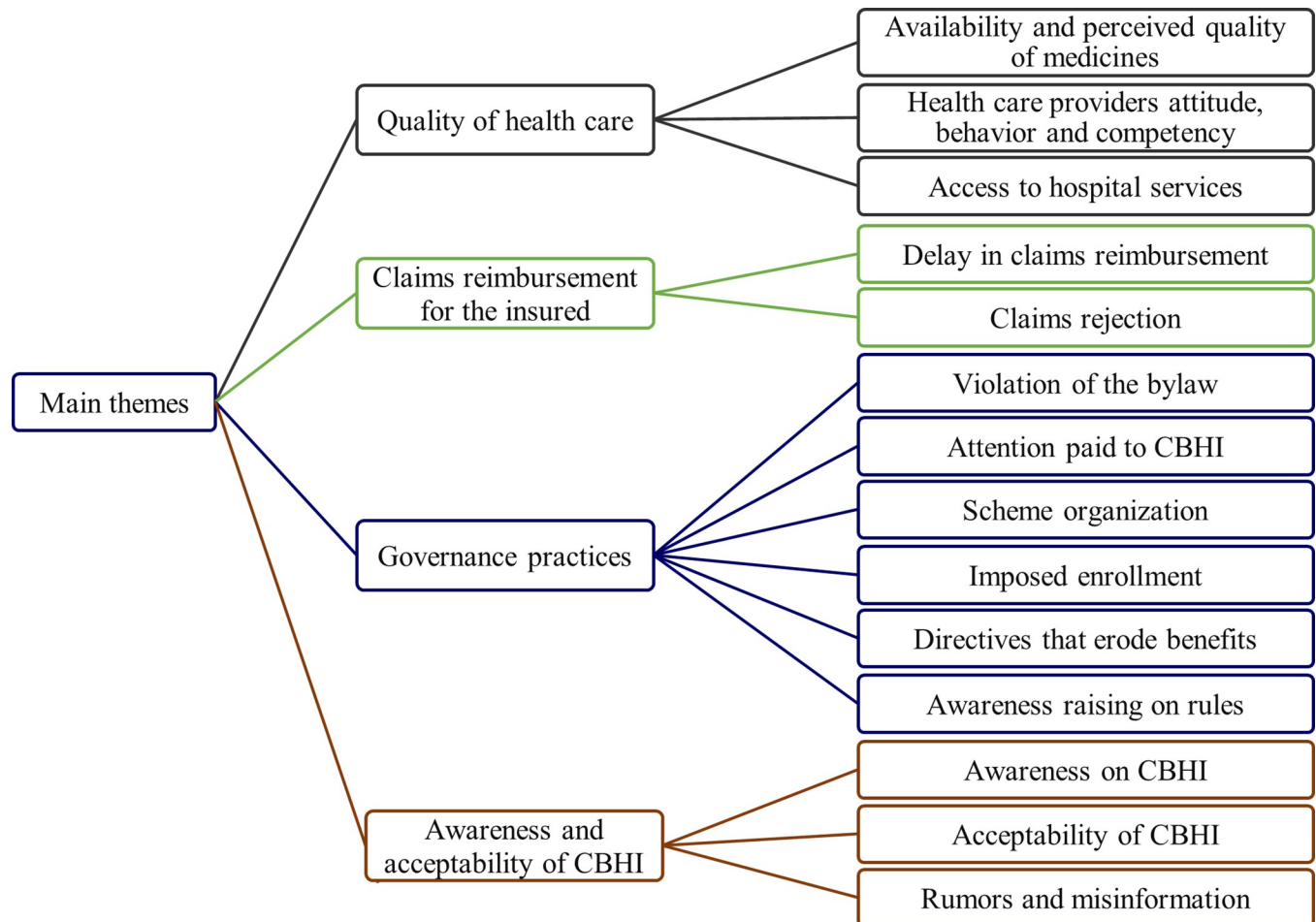


Fig 2. Main themes and sub-themes from interviews with CBHI members and key informants at two case study districts of northeast Ethiopia.

<https://doi.org/10.1371/journal.pone.0266583.g002>

In general, the community prefers injectables over pills, and compares medicines prescribed in public health facilities to those prescribed in private clinics. In public facilities, medicines are prescribed based on the standard treatment guidelines, whereas in private clinics, fast-acting injectables, and new generation medicines with brand a form are prescribed for most patients. However, the wider public is unaware of the benefits and risks of these approaches. Furthermore, health facilities are reimbursed for services rendered in accordance with standard treatment guidelines.

“I recover from my illness quickly if I get injectables. I don’t like swallowing medicines; it does not cure me. Why should we take their rotten medicines?” (IFI, current member)

Health care providers attitude, behavior and competency. One of the major concerns in the service delivery process of contracted health facilities is perceived discriminatory treatment of insured patients in favor of paying patients. Health service users stated that health care providers would negatively judge, label, verbally abuse, humiliate or belittle them owing to their insurance coverage. Some health care providers have also been accused of lacking good human relations, behaving rudely, speaking to patients in an unprofessional manner, not being caring and empathetic, and neglecting to assist them.

“My mother became ill and I took her to a health center, they (the health care providers) gave priority to paying patients while we waited for care. The one who has money is getting ahead, and the one with health insurance is waiting long.” (IDI-5, previous member)

“The problem now is that health workers prioritize paying patients and delay insured patients despite they get very sick.” (KII-18, Kebele leader)

Health care providers admitted that they may not demonstrate excellent interpersonal communication or spend enough time examining and discussing patients' health concerns due to increased workload associated with insurance coverage. They disagreed, however, on the assertion that insured patients are treated differentially in favor of paying patients. According to them, insured individuals associate everything that happens in health facilities with their insurance status. They believe that health care providers have abandoned them and that paying patients are given higher priority, based on the notion that insured clients attend health facilities for every minor ailment because of free health care. This is perceived discrimination, most of which did not really happen, and such issues were common during the early stages of CBHI, when health care providers were unfamiliar with the program, as most key informants stated.

“My wife got sick and we went to a health center for consultation. They told us to go to a referral hospital without a referral letter. I told them that if they did not write the referral letter, the hospital would refuse us. They told me something wrong, they insulted me. The health center is just a name, it is . . . It is not considered as if it is existing. Not complete treatment, let alone they do not speak a good language.” (IDI-5, previous member)

“Patients expect you to examine them thoroughly and do laboratory tests. This is the only way to make them happy. However, due to the high volume of patients, we are unable to fully deliver these services. . . . some clients allege, ‘They dispense me medications chopped into parts because I am a health insurance beneficiary.’” (KII-9, health care provider)

Furthermore, some participants believed that health care providers in health centers lacked the skills and experience to manage their conditions. They claimed that the prescribed medicines do not much the disease, providers treat patients without physical examination or laboratory tests and those working in rural areas are inexperienced. As a result, most insurance holders distrust health care providers and believe they are not there to assist them. As stated by health care providers, insured patients are not willing to accept professional advice and suggestions because they believe that providers are in opposition to them.

“The health center is structurally sound, but it is devoid of competent personnel. It's possible to conclude that it's empty.” (IDI-6, current member).

“Insurance subscribers are frequently blamed by health care providers. As a result, we assume they have an unfavorable attitude toward us and treat us badly.” (IFI, current member).

“When you advise them, they will not believe you.” (KII-8, health care provider)

Access to hospital services. Health service users expressed a variety of concerns about access to health services at the referral hospital. These include long waiting times, being made to pay in the event of an emergency if they don't have a referral letter from health centers, long appointments for non-emergency conditions, and service denial due to payment and contract issues. Despite the fact that CBHI subscribers are entitled to hospital services without a referral letter from health centers in an emergency, they are either forced to pay the treatment fee or

denied the service if they are unable to pay. Some people prefer private hospitals because they want immediate care and do not want to wait for extended appointments, but they are subjected to high treatment costs. Patients are also required to buy medicines in private pharmacies despite the fact that they are available in the hospital pharmacy, according to some study participants. In addition, one key informant revealed that insured individuals who seek exempted services at the hospital are ordered to buy medications from private pharmacies on purpose.

“I had a sudden illness before. I get better off with IV drugs in private hospitals. If I go for medical treatment using a health insurance card, I would die because they do not treat me right away.” (IDI-2, current member)

“Something is worrying you; the scheme is helpful for appointment-based treatments, but it is useless in emergency situations. Many people believe that in the event of an emergency, treatment at a private hospital is mandatory.” (KII-18, Kebele leader)

“Insured patients have been denied health services for more than three or four months in the hospital due to delays in claims reimbursements.” (KII-14, HEW)

Claims reimbursement for insurance holders

The issue of claims reimbursement appears to be another major impediment to CBHI implementation in both districts. Almost all respondents indicated that a delay in claims reimbursement was one of the key problems experienced by insured households. In Tehulederie, clients are frequently scheduled for several appointments and repeatedly travel to the health insurance office. They must also wait in long queues at the scheme's office to have their claims processed. To this end, they incur higher transportation costs and waste their time. Members opt not to submit smaller claims because of the extra costs of claims processing. This is not an issue in Kallu district, where reimbursements are made by HEWs at each *Kebele*. HEWs collect medical bills from scheme participants, process payments at the scheme office and disburse the money to participants. Although this reimbursement approach worked well in Tehulederie district, later HEWs abandoned it because of the increased workload and their fear of being held accountable, arguing that they had no obligation.

In addition, claims settlement delays are likely to result in the loss of documents and the closure of the fiscal year, which leads to claim rejection. According to scheme personnel, the delay was mainly caused by a budget deficit and a medical auditing process that must be completed before claims can be reimbursed.

“There are situations when reimbursing claims is too late. There are several scheme members who struggle for six, seven, or eight months and more until the end of the year, after which it is impossible to receive their claim. I don't meant to say that they have been completely denied, but people are getting increasingly frustrated. . .” (IDI-1, current member)

“We are advised to travel to the CBHI office to collect pocket money replacements. However, we are incurring additional transportation costs, even in exchange for small reimbursements. As a result, many people choose not to request claims less than 100 ETB [Ethiopian Birr].” (IFI, current member)

According to the majority of the in-depth interview participants, another concern they faced regarding pocket money reimbursement was claims rejection. They expressed their dissatisfaction by alleging that, despite submitting all required evidence, the scheme rejected their

appeals for a variety of reasons. Scheme personnel also acknowledged that claims rejection is common for a number of reasons, most of which stem from clients' misunderstanding of the kind of paperwork they should submit with their claims. They also disclosed that members of the scheme were unwilling to accept the rejection decision, regardless of the cause.

Presenting with illegal bills from private pharmacies, presenting bills from private pharmacies without attaching prescription papers from contracted facilities, mismatch between medications prescribed by physicians and those dispensed by private pharmacies, the prescription paper lacking the required signature and stamp, submitting claims after a deadline has passed, receiving treatment from a health facility that did not make a contract agreement with the scheme, receiving treatment in hospitals without being referred by health centers, and loss of submitted documents were some of the main reasons for claims rejection. One reason for the loss of submitted documents, according to a health care provider, is that documents presented by clients are likely to be disguised on purpose, especially for larger claims, because in some cases, there are players between the scheme and its members.

“Last year, the referral hospital refused to sign a contract agreement with the scheme. Insurance members were unaware that the deal with the hospital had not been reached. They sought medical treatment, paid the bill, and then requested reimbursement, but their claims were rejected.” (KII-13, HEW)

“Every month, I have a follow-up appointment for hypertension treatment in a hospital. When the hospital's pharmacy is out of medicine, I buy it from private pharmacies. Surprisingly, I've never been reimbursed for my pocket money. I gathered all past bills and attempted to get reimbursed, but they said it was too late and rejected my request.” (IFI, current member)

“We conducted a medical audit and rejected a lot of claims due to submission of illegal documents.” (KII-16, CBHI personnel)

Governance practices

One of the scheme's governance challenges is the lack of attention paid to its execution by higher-level authorities. Health insurance is only taken into consideration by higher authorities once a year during membership registration, after which no one is interested in supporting the scheme. They are unwilling to work together to solve the many problems that arise during implementation. According to some key informants, their primary concentration is on increasing the number of subscribers, rather than striving to serve the needs of the community. Due to a lack of technical and material assistance, scheme administrators were unable to undertake proper medical audits. Furthermore, the workload associated with the implementation of health insurance is not taken into account when it comes to equipping health facilities with the necessary infrastructure and personnel.

“The government did not pay attention to the implementation of health insurance. Although it is a useful institution, it has been neglected. Regional and zonal bodies appear only during the renewal period. For them [higher officials], health insurance is a campaign that only takes place once a year.” (KI-15, CBHI personnel)

District health insurance schemes have been organized and are working within the district health office; however, key informants believe that the current structure poses challenges to the scheme's performance. They claimed that a single sector should not be both a provider and a buyer of health care, because it creates accountability concerns. They proposed that health

insurance be organized as a separate autonomous sector with clearly defined roles and responsibilities, as well as a mechanism that allows active engagement of other sectors in the district. The service seller would be accountable for the quality of health care provided to the insured, while the service buyer would be accountable for claim reimbursements in their interaction.

“Do you think the health office would sue the health center if scheme members are not treated properly? Would the health center sue the health office if the service charge is not reimbursed timely? Is it possible for one pocket to sue the other? This is something unscientific. This is what makes the scheme ineffective.” (KII-1, district health officer)

According to the participants, another governance concern is that the rules governing the CBHI are being violated, as a result of which members are losing their benefits. The provision of health care to members and their families begins when the coverage ratio at the district level exceeds 60% of the target population, according to the bylaw. Participants in Kallu district complained that this rule is enforced at a *Kebele* level. As a result, certain *Kebeles* that did not achieve this objective were denied health care coverage for more than two months, including households who paid the premium. Some even object to the rule, arguing that once a person pays the premium, he or she has the right to receive the benefit package immediately.

“This year, certain segments of society have yet to benefit from health insurance. This is due to the fact that the Kebeles’ membership coverage is less than 60%. As a result, persons with chronic health conditions would pay for the health care charge for a month or two without insurance coverage, even if they renew early.” (KII-9, health care provider)

“After paying the premium, we must wait two months before receiving health care until everyone has been enrolled. Our family probably would get sick within the two month timeframe. Meanwhile, we are going to spend some money. In addition, I may not require treatment then after.” (IDI-8, previous member)

At the time of this study, the release of a new guideline on the implementation of claims reimbursement for the insured was a hot topic. The regional health bureau released a directive stating that claims reimbursements should be made at the price set by public health facilities, which is far lower than the price in private institutions. Stakeholders participating in the implementation of the CBHI have voiced worries about the impact of the directive on future membership growth efforts as well as the risk of undermining benefits for scheme members. Let alone this directive, the community was not satisfied with the existing reimbursement system. It would be another major impediment to the community’s participation in the scheme.

“If the current law about pocket money reimbursement remains in place, no one wants to join the health insurance plan. For example, one member had treatment that cost 5,000 ETB, but he was only paid 1200 ETB under the new rule. ‘What is the significance of health insurance?, what happens if I drop out of the scheme and have to pay for my own treatment?’ he said.” (KII-15, CBHI personnel)

“. . . , why do people suffer? If this is the case, we do not need to be covered by health insurance. When you’re sick, it’s better to go to a private facility. Either the government must provide all services through its own health facilities or private organizations must limit the pricing of medicines. Otherwise, we will not find anyone to register in the future.” (KII-18, Kebele leader)

Insured households are also unable to receive the full range of CBHI benefits due to a lack of awareness of the procedure they should follow. Community members who took part in the interviews claimed that they were not aware of important directives when it came to their benefits. This is the main reason for the high claims rejection ratio that has been reported.

“The goal of health insurance is to be profitable. The community was unaware that the scheme would reimburse for pocket money. The insurer does not want the public to know. The community became aware of this regulation after a long period.” (IFI, current member)

Members of the community complain that, despite participation being voluntary, the Kebele leaders are forcing them to enroll and renew their membership. Kebele leaders, HEWs and scheme administrators have also admitted that there is some form of “positive enforcement” for membership enrollment and renewal. Some argue that CBHI is politicized, because refusing to enroll is often seen as a sign of opposition to government policies. Enforced enrollment erodes the community’s sense of ownership and leads people to develop a negative attitude toward health insurance.

“We are being forced to pay the health insurance membership fee by Kebele leaders. They will refuse to receive labor tax if we do not pay our health insurance contributions in advance, and if we refuse, we will be jailed. If they force the community, it appears to them that they are being forced for the government’s advantage rather than their own.” (IFI, current member)

“. . . , when you see the majority, they are forced by the Kebele leaders, and we are going home to home and ask them to renew their membership.” (KII-14, HEW)

“People should join health insurance voluntarily. If they are forced to join the scheme, and they become upset over something in the health facility, they will complain that something big has happened and are prone to quite their membership (KII-9, health care provider).

According to a Kebele leader from a high-performing area, Kebele administrators’ commitment is vital to membership development. He stated that his Kebele was able to achieve higher insurance coverage as a result of his dedication and never-ending efforts to address challenges in protecting scheme members’ benefits. He believes that enforced enrollment has no place in achieving effective insurance coverage.

“Despite it is not my obligation, I inquire as to why the health center does not provide proper service while we are urging people to enroll. No one ever turns me down for enrollment since they know how enthusiastic I am about it. Anyone who believes I am on his side will put their faith in me. They pay attention to what I have to say. If you support them, they will stand with you. They may be harmed due to events beyond our control, but we must do everything we can to assist them. Why do they pay the premium for the next year if you take the membership fee and remain quiet while they are oppressed and crying?” (KII-18, Kebele leader)

Community awareness and acceptability of the CBHI

Community awareness. Other scheme performance challenges are emerging from the community’s low awareness and unfavorable attitude regarding health insurance. There is low awareness of the type of services they are entitled to receive, the capacity of contracted health centers, the principles underlying CBHI, and the steps they need to follow to secure their benefits, especially for claims reimbursement.

People who are insured have higher expectations of health care services. When their expectations are not met, they tend to blame the system and terminate their membership. Some members of the scheme are also unaware of the notion of solidarity. They wish to receive the benefits of the scheme in exchange for their contributions.

“Some people claim that ‘If I don’t get treated, what is the benefit of health insurance?’ because the year passes by without treatment. It will, however, benefit them in an emergency. It’s due to a lack of understanding.” (IDI-6, current member)

“If health insurance is voluntary, no one will renew the membership in our Kebele, except those with known health problems. They have no desire in mutual support, but rather have a desire to be supported. Some people re-enroll after dropping out of health insurance, when they need health care.” (KII-12, HEW)

Acceptability of CBHI. Most of the interviews indicated that health insurance is not well accepted in the community. Certain members of the community did not value the benefits of health insurance. For some of them, CBHI is a political instrument that isn’t being used for the community’s benefit. They stated that they are paying the premium not to be different from the rest of the population and to avoid confrontation with the *Kebele* leaders. Others are renewing their policy to maintain their relationship with *Kebele* leaders and HEWs who are mobilizing the community. Even some of the insured seek health care in private clinics at their expense, and others pay the premium without renewing their membership identification cards.

“The community is not interested to enroll in health insurance. We are literally begging people to subscribe or renew their membership. When we visit the community during the renewal time, some residents close their doors and hide. They don’t want to hear our voice at that time. They don’t want anyone to bring up the topic of health insurance in general.” (KII-12, HEW)

“We pay a health insurance membership fee to keep ourselves connected to the rest of the community. Many people pay the membership fees, but never receive the membership card; they do so to avoid being accused by Kebele leaders.” (IDI-8, previous member)

“Health insurance is a deception; it simply serves to collect fees and instigate disputes among farmers. The kebele leaders urge us to become member of the health insurance, it seems we have enrolled into something that we did not know exactly.” (IDI-5, previous member)

Rumors and misinformation. Another concern that prevents people from joining or adhering to the scheme is the spread of misleading information in the community. Health care delivery and insurance-related problems are widely publicized; some are exaggerated, while others are rumors or misinformation. When something goes wrong with health care or insurance services, word spreads swiftly throughout the community. Even those who have not encountered the situation appear to be lamenting it as though it has happened to them. In addition, people attempt to portray a distorted image of the community’s true problem. Rumors and misinformation concerning health care delivery and insurance services quickly circulate throughout the community, with some emanating from private clinics to attract more consumers. Even an issue that occurred at the time of the introduction of health insurance is still rumored in the community as a fresh problem, despite the fact that it was already resolved.

“Another is propagation of rumors in the community. If a person faced a problem related to health insurance, he or she can take to the community and spread in a misleading manner.”

Such rumors are more likely to be heard in society than the stories of people who have benefited from the scheme.” (KII-2, health center director).

“Rumors and misinformation are widely accepted in the community and are often used to discredit health insurance; nevertheless, good things are rarely acknowledged.” (KII-1, district health officer)

Surprisingly, the community, including those who have left out and are criticizing the scheme do not want health insurance to be abolished, since they know they will be able to rejoin and benefit from it at a later point in time.

Discussion

This study examined the scheme’s enrollment trends using key indicators and explored its performance challenges from the perspectives of various stakeholders. The enrollment status at both districts has shown non-linear trends over the study period with both positive and negative growth ratios being noted. In Kallu district, both the coverage and renewal ratios increased sharply between 2017 and 2018, however in Tehulederie, both ratios only slightly changed during the same period. This discrepancy between the two districts might be attributed to the timing of the scheme’s initiation, which was two years late in Kallu. Membership growth for a voluntary program is a bit slower at first, and increased as awareness improves over time. Increased growth is expected at the early stage of the scheme because of the lower membership base [12]. The coverage ratio in both districts seems to have stabilized at around 60% since 2018. One plausible explanation is that, in accordance with the bylaw, members won’t be permitted to access health care if district-level health insurance coverage falls below 60%. The district administrator who fails to meet the membership requirement will be responsible for the problems caused by the service interruption [40]. As a result, those in charge of membership enrollment may exert extra effort up until this requirement is met. Overall, the scheme in Tehulederie has a relatively higher population coverage and better membership retention. This could be due to the strong foundation laid by a rigorous public awareness campaign throughout the pilot period, as well as the technical assistance provided to the district’s relevant stakeholders [34]. As noted from the qualitative interviews, another possible explanation is that the perceived poor quality of health care, particularly the lack of access to medicines in CBHI affiliated health facilities, was a bigger worry in Kallu district than in Tehulederie, which might be impeding the scheme’s membership growth capacity.

The low renewal ratios along with an erratic membership growth in Kallu suggests that the scheme is experiencing internal movement, with some households leaving and others joining, potentially exposing it to adverse selection. This will result in a higher claims ratio, lower net income, and maybe bankruptcy if the problems are not fixed [12]. In support of this argument, findings of a companion article of this series on the financial performance of the schemes showed that both schemes experienced an excess claims ratio during 2014 to 2020. The scheme in both districts spent more than it received for claims settlement in almost all the period under the study, and hence experienced heavy losses in these periods. Adverse selection was the key issue that, among other things, led to an increase in the scheme’s claims costs [47].

To remain viable, a micro-insurance program must have a minimum growth ratio of zero [11]. However, both schemes have experienced negative growth ratios over the time period under study. Furthermore, population coverage falls short of Ethiopia’s Health Sector Transformation Plan, which aspires to 80% coverage by 2020 [48]. It has been noted that this level of insurance coverage was achieved by enforcing different intimidation techniques during the enrollment or renewal periods without the community’s discretion, instead of employing

membership attraction or retention strategies. The qualitative data highlighted a number of issues that could be contributing to the observed level of performance in terms of membership enrollment trends. The first and most critical issue impeding membership growth is insurance members' dissatisfaction with quality of care provided by contracted health facilities. Unavailability of medicines, perceived poor quality of medicines, perceived discrimination by health care providers, absence of good interpersonal interactions, and lack of trust in the competency and caring attitude of health care professionals were the main health care quality issues. The common complaints with respect to hospital services include long waiting times, long appointments for non-emergency conditions, and the inability to access emergency care free of charge without a referral letter.

The findings on medicine availability basically corroborate what has been documented in the literature, which has linked it to low enrollment and renewal rates in the scheme. In Ethiopia, the quality of health services, notably the availability of most essential medicines in public facilities, influences household decisions about whether or not to enroll or renew [49]. A study comparing the performance of two districts based on membership enrollment in Tanzania found that the high-performing district had better medicine availability [50]. Overall, scarcity of medicines at contracted service provider facilities was a common problem experienced by insured patients in different settings [28, 51–55]. The perceived low quality of medicines was also identified as a major barrier to insurance subscription. For non-subscribers, a major factor for not to participate in the scheme was the low quality of medicines provided to insurance members [19, 56]. It was also revealed that the insured who were given generic medicines thought the care they received was of inferior quality [57].

Insured households were also dissatisfied with the way health care providers dealt with them. Many felt discriminated against because of their health insurance status, and they expressed their frustration with the disrespectful behavior and uncaring attitude of care providers. This was highlighted during the CBHI pilot phase in Ethiopia, where health care providers did not treat insured patients appropriately, believing that most insured people came to the health facility with minor medical issues due to the free service [28]. For the insured, health care providers were less likely to take their weight and temperature, use a stethoscope, physically examine them, and inform them of their diagnostic results in Burkina Faso [58]. In Rwanda and Ghana, insured patients reported a climate of disrespect and carelessness [17] as well as an unjust queuing system that favors the uninsured [59]. Other studies have also reported that insured patients have perceived and experienced discrimination and verbal abuse from health care providers [18, 19, 23, 51, 52].

It was understood that, due to the increased workload related to insurance coverage, health care providers were unable to display good interpersonal interaction or spend enough time examining and explaining patients' health concerns. It was also apparent that some care providers have shown signs of bitterness as a result of their overworked schedules. This may be partially attributable to the fact that, despite increased workload, there is no incentive system in place for health professionals. However, the claim that insured patients are handled differently than paying patients was mostly based on the insured's perceptions, which seems not really happening. In either scenario, whether there was perceived or actual discrimination, the scheme's ability to attract and retain members would be hampered. Overall, the findings of this study indicated a lack of mutual trust in the relationship between scheme members and health care providers. Insured people associate everything that happens in health facilities with their insurance status, whereas health care providers might be biased in the notion that insured people visit health facilities for every minor ailment owing to free treatment. Improving health care providers' interpersonal communication skills could be crucial to enhance mutual understanding and, as a result, to address most of these concerns.

The findings also revealed that some scheme members had little faith in the overall quality of health care provided by CBHI-affiliated health facilities. This was primarily because of their preferences, expectations, and level of awareness. As a result, people with financial means choose to go to private clinics and pay for their own care. If health care is of poor quality, membership will be less attractive, and expanding membership coverage will be challenging for the relevant stakeholders. It has been documented elsewhere that low perceived quality of care was a major reason for low enrollment and renewal of subscriptions [16, 22].

Despite the fact that quality of care is vital to the success of UHC initiatives, governments have paid little attention to it, which Ridde and Hane (2021) described it as a “known but often ignored challenge” [60]. Quality of care will continue to be a major bottleneck to the scheme’s sustainability unless the government devotes significant resources to health system strengthening, particularly human resource development and pharmaceutical supply, in order to meet the rising health care demand. It has been recognized that the scheme was launched without first strengthening the health system’s capacity to handle the increasing patient flow and workload without compromising the quality of care, which was the main root cause for the existing problem.

Members of the scheme are entitled to reimbursement for any medical services they bought in private institutions due to a lack of availability in CBHI affiliated health facilities, as long as they follow the appropriate procedures. The scheme’s performance in this regard can be assessed using the timeliness of reimbursement and the rejection ratio of submitted claims. The effectiveness with which claims are processed has a direct effect on subscriber satisfaction, which in turn has an impact on membership growth [12]. The findings revealed that claims settlement for OOP expenses was another source of dissatisfaction among insured persons. While OOP spending is a problem in and of itself, clients are not properly reimbursed for their expenditures. Both the delay in reimbursement and the rejection of claims were major complaints. Scheme participants must wait a long time for their claims to be processed, with repeated appointments and long queues at the scheme office. For insured households who reside in remote areas, the cost of traveling to the scheme and the opportunity costs of following up on claims processing outweigh the benefits of receiving the claim. We were unable to get claims reimbursement records from the scheme office in order to determine the claims rejection ratio. However, the qualitative data clearly indicated the depth of the problem. Claims rejection was also common for a number of reasons, most of which stem from clients’ low understanding of the kind of paperwork they should submit with their claims. In essence, claims rejection reflects how well insured people understand the scheme [12]. When a claim is denied, it creates a negative perception of the insurance scheme that spreads beyond the claimant, undermining membership enrollment and renewal.

The findings reveal a lack of political will and commitment to the scheme’s implementation. Rather than solving the many problems that arise during implementation and striving to serve the needs of the community, the primary concentration is on growing the number of enrollees. The efforts made by higher authorities are once-a-year campaigns that are only apparent at the time of membership enrollment. The scheme will fail to meet its mission as long as respective authorities at all levels of government do not closely monitor and support its implementation. This is corroborated by another study in Nigeria, where non-involvement of local government officials in the implementation of a CBHI scheme negatively affected its effectiveness [61]. The scheme at the district level, where it is operationalized, is not an autonomous sector. Instead, it has been organized under the district health office, with a single sector acting as both a provider and a buyer of health care, raising accountability concerns.

There appear to be some “insurer moral hazard” practices in the scheme’s governance, which could be explained by a lack of transparency, the issuance of directives that limit the

insured's benefits, and infringement of governing rules. The insurers have not adequately communicated how the health insurance program works, which may be linked to the scheme's financial strain. Most of the time, scheme members remain in the dark about what they must do in order to receive their claims. This mirrored the findings of the Ethiopian pilot phase evaluation, which found that members went to private pharmacies without knowing what was required for reimbursement, resulting in their claims being rejected and leaving them highly dissatisfied [25].

A new directive was issued at the time of this study, stating that claims reimbursements should be made at the price set by public health facilities. Concerns have been raised about the impact on future membership growth efforts, as well as the risk of jeopardizing scheme membership benefits. It will threaten both access to health care and the scheme's capacity to provide financial protection. Although the purpose of health insurance is to eliminate uncertainty, the amount of money that will be reimbursed will be unpredictable as a result of this directive. The poor will be hit harder, as it is likely that a large portion of the bill will go unpaid, or that they will forego treatment because they are unsure how much of their OOP expenses will be reimbursed. Instead of limiting claims benefits, it is essential to consider certain limits on the number of visits in a given period to discourage unnecessary visits to health facilities. Infringement of governing rules, which results in legitimate benefits being withheld from members, is another form of governance concern that could hamper membership growth.

The fact that some households pay the premium without renewing their membership implies that the scheme is undervalued, and that scheme administrators are equating insurance coverage with revenue collection regardless of whether or not scheme members use health services and being protected from financial hardship. It also signifies that enrollment is compulsory. To be successful, key stakeholders involved in membership mobilization should focus on protecting the interests of the community. Building mutual trust with the community should be a priority, according to best practices learned from a high-performing village. Those who have direct contact with the community during membership enrollment, such as *Kebele* leaders and HEWs, should demonstrate commitment to assisting scheme members in addressing their complaints. People's resistance to membership enrollment will be substantially reduced if they become community advocates. It has been argued that in order for a CBHI to be effective in terms of population coverage, voluntarism should be abandoned. Mandatory enrollment, on the other hand, can only work if governments commit to considerably expanding public funding of the health system and subsidizing members' contributions [14]. People may have a feeling of ownership if enrollment is voluntary, which may improve community members' participation in decision-making. Due to the existing weak financial systems and poor quality of health care, mandatory enrollment will cause the community to develop a negative attitude towards the scheme. Furthermore, if people are forced to participate in the scheme, they may engage in abusive behaviors.

Another concern that prevents people from joining or adhering to the scheme is the spread of misleading information in the community. Problems are widely publicized; some are overstated, while others are rumors or misinformation. This will severely compromise the sustainability of the scheme unless they are proven to be spurious claims. It contributes to the development of negative attitudes regarding health insurance in the community. The community does not value the scheme, and for some it has been seen as a political tool that is not being used for the community's benefit. The majority of people only want to join health insurance when they are facing a serious illness, and quit the scheme when they no longer need care. This necessitates the implementation of awareness raising strategies that could help in the debunking of misinformation and rumors surfacing in the community.

The study's main limitation is that it was unable to investigate the overall scheme execution period due to insufficient data. Furthermore, due to a lack of records on rejected claims, we were unable to determine the claims rejection rate for the schemes. The use of secondary data may not accurately reflect real enrollment trends. The findings will, however, provide valuable insight for the study districts, as well as other areas with similar setups that would like to initiate improvements. It will be an essential input for policymakers as they strive to establish higher-level pools and revise scheme designs.

Conclusions

The scheme experienced negative growth ratios in both study sites over the study period, showing that the program is not functionally viable. The low quality of care was a key barrier to membership development. It will remain a major bottleneck to the scheme's sustainability unless the government invests significantly in health system strengthening, particularly human resource development and pharmaceutical supply, in order to meet growing health care demand. The delay or rejection of claims reimbursement for insurance holders was another threat to membership growth. The presence of certain "insurer moral hazard" tactics, which seek to reduce the scheme's financial burden, perpetuates this problem. All these will erode the community's trust in the scheme, which in turn will have an impact on membership growth. Compulsory enrollment is an implicit approach for increasing membership coverage, but it is unlikely to be a long-term solution unless the government focuses on quality improvement initiatives. Instead, scheme administrators and other stakeholders should foster a trusting climate among community members and develop less costly attraction strategies. It is suggested that awareness raising strategies be implemented to help debunk misconceptions and rumors that are prevalent in the community. Overall, the scheme will inevitably fail to attain its mission unless relevant stakeholders at all levels of government demonstrate political will and commitment to its implementation, as well as advocate for the community.

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RESEARCH ARTICLE

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Financial viability of a community-based health insurance scheme in two districts of northeast Ethiopia: a mixed methods study

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Abstract

Background: Community-based health insurance initiatives in low- and middle-income countries encountered a number of sustainability challenges due to their voluntary nature, small risk pools, and low revenue. In Ethiopia, the schemes' financial viability has not been well investigated so far. This study examined the scheme's financial viability and explored underlying challenges from the perspectives of various key stakeholders.

Methods: This study employed a mixed methods case study in two purposively selected districts of northeast Ethiopia. By reviewing financial reports of health insurance schemes, quantitative data were collected over a seven years period from 2014 to 2020 to examine trends in financial status. Trends for each financial indicator were analyzed descriptively for the period under review. Interviews were conducted face-to-face with nine community members and 19 key informants. We used the maximum variation technique to select the study participants. Interviews were audio recorded, transcribed verbatim, and translated into English. Thematic analysis was applied with both inductive and deductive coding methods.

Results: Both schemes experienced excess claims costs and negative net income in almost all the study period. Even after government subsidies, the scheme's net income remained negative for some reporting periods. The challenges contributing to the observed level of financial performance have been summarized under five main themes, which include adverse selection, moral hazard behaviors, stockout of medicines, delays in claims settlement for service providers, and low insurance premiums.

Conclusions: The health insurance scheme in both districts spent more than it received for claims settlement in almost all the period under the study, and experienced heavy losses in these periods, implying that it is not financially viable for the period in question. The scheme is also unable to fulfill its purpose of protecting members against out-of-pocket expenses at the point of health care. Interventions should target on the highlighted challenges to restore financial balance and enhance the scheme's viability.

Keywords: Financial viability, Community-based health insurance, Mixed methods, Ethiopia

Background

To achieve the goal of universal health coverage (UHC), it is vital to develop a sustainable health financing mechanism integral to the broader health system [1–4]. The purpose of UHC is to ensure that everyone has access to the health services they need, at a sufficient level of quality, and that using those services does not put them in

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financial hardship [5]. Out-of-pocket (OOP) payment, which is the main obstacle of UHC, can be reduced and replaced by prepayment and pooling approaches that generate stable and sufficient funds for health. It has been suggested that incorporating and expanding prepayment micro-health insurance schemes into the broader health system pool is important, especially in low and middle income countries [6].

In recent years, community based health insurance (CBHI) has been adopted by many low and middle income countries to improve access to health care and financial protection, especially for people working in the informal sector and the rural poor [7]. From the early 1990s on, the African CBHI movement began to receive increased foreign assistance. The movement grew in strength over time, and governments and donors were interested in CBHI's potential to improve access to health care in difficult situations [7–9].

In low-income countries, CBHI has the potential to enhance health service access, financial risk protection, awareness and knowledge of the value of insurance, and resource mobilization for health from the general population through a prepayment mechanism [10]. If the scheme is backed by government policies and effectively implemented, it is possible to move away from OOP payment, and it can be a sustainable source of health care finance in the move to UHC [11]. For example, Rwanda and Ghana have made significant progress towards UHC by reshaping a system of local CBHI initiatives into a national health insurance program [8, 12]. However, with the exception of a few successful cases, CBHI schemes in many low- and middle-income countries have experienced a number of sustainability challenges and have failed to reach UHC, owing to their voluntary nature, small membership base, and limited revenue [7, 8, 13]. In CBHI schemes, the healthy are either hesitant to enroll or cancel their membership after joining, resulting in small size pools with little ability for risk redistribution [14]. Small contributions from low-income informal sector participants [7, 10], insufficient risk management [13], and existence of insurance related risks (adverse selection and moral hazard behaviors) continue to limit the schemes' financial sustainability [15–17]. Adverse selection refers to the tendency for individuals with a high health care need to join an insurance scheme in a higher proportion than that represented by their share of the general population, while moral hazard refers to the phenomenon to which members of a health insurance tend to consume benefits abusively, or more than usual, in order to maximize the value of their premiums [18].

Adverse selection puts a greater strain on the financial viability of the scheme as premiums become insufficient to cover the health care costs of the higher than

anticipated demand [15]. Studies revealed that adverse selection was widespread in voluntary health insurance schemes in China [19, 20], and in the national health insurance of Ghana [17]. On the other hand, it has been documented that insurance members opt to cancel their policy because they had not fallen sick often, indicating adverse selection [21–24]. In Ethiopia, quantitative findings suggestive of adverse selection have been reported by different studies [25–27]. Studies in Ghana explored a number of moral hazard behaviors that adversely impact the scheme's efficiency and financial position. Some of these behaviors include repeated visits to a health facility; visits to facilities with the slightest ailment; visits to different facilities with the same illness; and collecting drugs for uninsured relatives or friends, for sale or to store at home before their card expires [28–30]. According to the evaluation result of the pilot schemes in Ethiopia, both patient and service provider moral hazard behaviors were reported as potential threats for the financial viability of the scheme [31]. Moreover, low rate of insurance premiums in relation to the cost of health care has been highlighted as one important factor in the scheme's financial deficiency [30, 32].

Empirical evidence on the financial viability of CBHI schemes is required in order to establish higher-level pools that allow for cross-subsidization between high-risk and low-risk areas [10]. Financial viability, which reflects the ability of a health insurance scheme to cover expenses with income on a sustainable basis, is one of the most important considerations to examine [18]. The key performance indicators for measuring financial viability include claims ratio, and net income ratio. Claims ratio measures the proportion of premiums used for the reimbursement or payment of claims. It measures the average proportion of premiums returned to the insured in the form of benefits, which helps to answer the question of whether premiums are spent primarily to pay benefits. The net income ratio measures the program's viability and profitability, as well as whether premiums are sufficient to cover scheme administration and health care costs [18, 33].

In Ethiopia, the scheme has not been investigated in terms of financial viability and its challenges from the perspectives of various stakeholders. Therefore, the purpose of this study was to examine the scheme's financial viability over a seven-year period from 2014 to 2020, and to explore underlying challenges from the perspectives of key stakeholders involved in its implementation using a mixed methods approach. Ethiopia's current health care financing strategy aims to establish higher level insurance pools at regional and national levels [34]. The findings of this study will be a valuable input for policymakers in an effort to establish higher-level pools. It will also be

essential for relevant stakeholders to overcome implementation challenges and to develop financial as well as risk management strategies.

A brief overview of CBHI in Ethiopia

Ethiopia is implementing a voluntary CBHI scheme, which aimed to cover the health financing needs of the rural population that constitutes an estimated 85% of the country's total population. The scheme was launched as a pilot project in 13 districts across four regional states in 2011, as part of the health financing reform aimed at meeting the goal of UHC [31]. Based on lessons learned from the evaluation findings, the scheme was first expanded to 161 districts in July 2013, and to 827 districts as of July 2020 with a population coverage of 50% [35].

The CBHI scheme is run by the government with community involvement in its design, management, and supervision. Membership is at the household level and need to be renewed every year voluntarily. Premiums and government subsidies are the scheme's main source of revenue. The federal government provides a general subsidy that constitutes 25% of total annual enrollment contributions. Furthermore, regional and district administrators offer targeted subsidies as a fee waiver to cover the health care costs of 10% of the target population who are indigents. Scheme management costs (salaries, office space, and operational costs) are also financed by the government budget [31]. Premiums are set at the household level based on core family members (a mother, father, and their children under the age of 18) and additional annual premiums must be paid for each non-core family member. For instance, in the Amhara regional state, where this study was conducted, the annual premium ranged from \$8.89 to \$12.19 based on family size, with an extra 2.54 dollars to be paid for each non-core family member [36].

The benefit packages cover all inpatient and outpatient services at public hospitals and health centers within Ethiopia, except for cosmetic treatments, organ transplants, chronic renal dialysis, treatment for exempted services, and non-generic medicines [31, 36]. To get free health care through CBHI, members must follow the referral procedure. Individuals who bypass health centers and seek treatment at hospitals without a referral letter will not be reimbursed by the scheme [36].

Methods

Study setting

This paper is the fourth series of a research project examining the sustainability of a CBHI in Ethiopia. A similar methodological approach has been used in an earlier companion article of this series (Hussien M, Azage M, Bayou NB: A mixed methods study of community-based

health insurance enrollment trends and underlying challenges in two districts of northeast Ethiopia: a proxy for its sustainability. Forthcoming). This study was conducted in Tehulederie and Kallu, two rural districts in northeastern Ethiopia. Tehulederie has seven urban and 20 rural *Kebeles* (subdistricts), with a population of 145,625, from which rural areas accounted for 87.5%. The district has one primary hospital and five health centers. Kallu district comprises four urban and 36 rural *Kebeles*, with nine health centers. With a population of 234,624, it is the zone's most populous district, of which 89.11% are from rural areas [37]. Agriculture is the main source of income for the majority of the population in the study areas.

Tehulederies was one of the CBHI pilot districts in Ethiopia, which began implementing the initiative in July 2011. Two years later, the scheme was launched in Kallu, in July 2013. The scheme at a district level is integrated under the health sector and governed by the health insurance board. The board signs a contract agreement annually with public health facilities, and service charges need to be reimbursed every three months based on a fee-for-service payment method. After submitting claims, health facilities must receive the payment within two weeks. Before reimbursing them, the scheme conducts a medical audit. The scheme also reimburses insurance members for OOP expenses for medicines and other services made in private institutions, as long as they follow the correct procedure. *Kebele* leaders and health extension workers (HEWs) are the main actors for membership enrollment, renewal and premium collection at a *Kebele* level. HEWs are community health workers, and one of their responsibilities is to mobilize the community for CBHI enrollment.

Study design

A mixed methods case study was employed, with quantitative and qualitative data collected parallelly. The study applied a qualitatively driven, concurrent nested design with the intent of generating different but complementary data which offer a holistic view of the scheme's financial viability. The quantitative part sought to examine the scheme's financial position using key performance metrics over a seven years period from 2014 to 2020, while the purpose of the qualitative part was to explore the underlying challenges that hampered the scheme's financial viability. The two components are integrated at data interpretation stage.

Participant selection

Each of the two districts was treated as a distinct case study of the scheme's performance. The two case study

districts were selected purposively. Tehulederie was selected as an outlier case, since it was the only early adopter of the scheme in the zone as a pilot district. Kallu is the largest district that shares diverse geographical features with other districts, hence was selected as a typical case. Outlier sampling or deviant case sampling involves selecting cases that are information rich, because they are unusual or special in some way, while typical case sampling involves selecting and studying cases that are average to understand, illustrate, and highlight what is typical and normal [38].

Qualitative interview participants were selected purposely using a maximum variation technique to gain insight from a wide range of perspectives and to document important shared experiences that cut across the diverse stakeholders involved in the implementation of CBHI scheme [38]. Key informants were recruited based on their active involvement in the scheme's implementation and their ability to provide a great deal of information. A total of 19 key informants were selected, which included one district health officer, two scheme personnel, four health center directors, five health care providers, three *Kebele* leaders and four HEWs. Two of the key informants have been working as health care providers in one of the study districts with the principal investigator. Nine community members were selected by HEWs for in-depth interviews based on their insurance status and their ability to provide relevant information. HEWs are familiar with the population in rural *kebeles* since their main responsibility is to deliver home-based health services and mobilize the community for health insurance. Five current and four previous insurance members were participated in this regard. Overall, a total of 28 participants took part in the qualitative interviews. The final sample size for each study district was decided based on the notion of data saturation, with no new information emerging from participants [39].

Data collection

The data was gathered between February 8 and May 2, 2021. Quantitative data was obtained from the financial reports of the two CBHI schemes retrospectively, using checklists crafted based on key performance metrics. Documents on audited reports, financial statements, and claims payment books of the scheme were reviewed. Data was collected on total contributions, government subsidies, internally generated funds, operational expenditures and medical bills. Despite we attempted to assess all years of the scheme's execution, we were only able to obtain complete data from 2014 to 2020.

In-depth interviews (IDI), key informant interviews (KII), and informal field interviews (IFI) were used to collect qualitative data [38]. The IDI was undertaken with

current and previous CBHI members to learn about their experiences with health care utilization, OOP payments, and community interest for enrollment. The KIIs aimed to explore the perspectives of various stakeholders on health care quality, claims management, community enrollment practices, risk management, and client and health care provider behaviors that undermine the scheme. All interviews took place on a predetermined schedule in a convenient location. Informal interviews were also conducted with various individuals during district health office, health facility and home-to-home visits to supplement the formal interviews.

All the formal interviews were undertaken face-to-face by the principal investigator using an interview guide meant to explore the experiences and viewpoints of participants using open-ended questions that were then probed further to elicit more discussion. Interviews lasted 10 to 40 min and were conducted in Amharic, the local language. With the participants' permission, all the formal conversations were audio recorded using a digital voice recorder. During informal interviews, field notes were taken. Everyone we approached agreed to participate in this study.

Data analysis

Quantitative data on financial status were analyzed using Microsoft Excel sheet based on performance indicators selected for this study. Financial viability refers to the ability of the CBHI scheme to rely on its income to cover expenses over the long term [18]. It was measured using the claims ratio and net income ratio. The trends in claims and net income ratios were analyzed over the last seven years. Claims ratio was calculated as the annual incurred claims divided by the earned premium, whereas the net income ratio is the annual net income divided by the earned premium in the same period [33], which in our case is the Ethiopian fiscal year that extends from July to June.

The audio recordings were transcribed verbatim, and then translated into English. Field notes were written as part of the transcripts. The qualitative data were analyzed thematically using the Atlas.ti 9 software package. To have a better understanding of the data set, all interview transcripts were read and reread thoroughly. In the coding process, both deductive and inductive approaches were applied. By identifying preliminary themes and sub themes based on the research questions and a review of available literature, the deductive technique was used as a starting point. Inductively, themes that emerged during the coding process were added. Initial coding schemes were generated by the principal investigator who then classified the codes into subthemes and themes. The coauthors reviewed the

preliminary findings and came to a consensus through repeated conversations.

To improve trustworthiness, we applied a variety of techniques, including data triangulation, rich description, and reflexivity. The use of different methods of data collection and data sources (method and source triangulation) could improve the findings’ credibility [40]. The lead investigator kept a reflective journal over the research process to document expectations, feelings, observations, interview experiences, and decisions made [41]. To improve understanding and transferability, we provide a rich, thick description of the research setting, process, and findings. We made a detailed description of the findings, backed up by sufficient evidence in the form of quotes from participant interviews [39].

Results

Brief description of revenue and expenditure data

The health insurance scheme in Tehulederie district collected a total revenue of 22.25 million Ethiopian Birr (ETB), or \$877,403.60 from 2014 to 2020 fiscal year, of which 32.25% was from a government subsidy. The total expenditure in that period was 22.60 million ETB (\$917,314.02), of which almost all (99.36%) was incurred for medical bills. During the period, the scheme had a negative net income of 7.53 million ETB (\$330,949.13) before subsidies, and 350,593 ETB after subsidies.

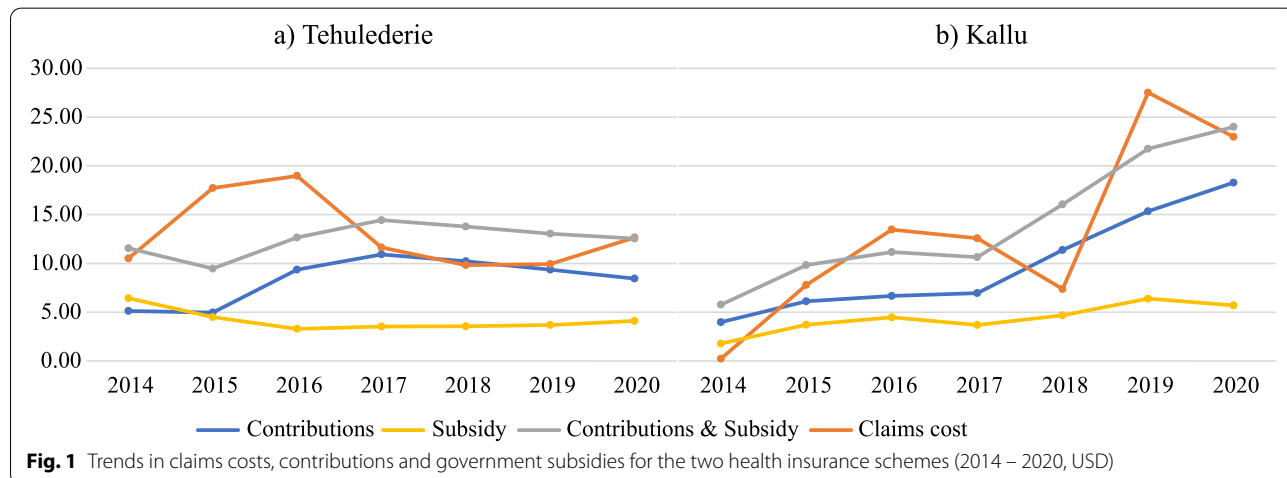
In Kallu district, the scheme collected 27.50 million ETB (\$1,011,537.52) in the same period, of which 29.26% was from a government subsidy. The total expenditure was 28.39 million ETB (\$1,020,607.36). Claims cost accounted for 89.50% of the total expenditure. A negative net income of 8.94 million ETB

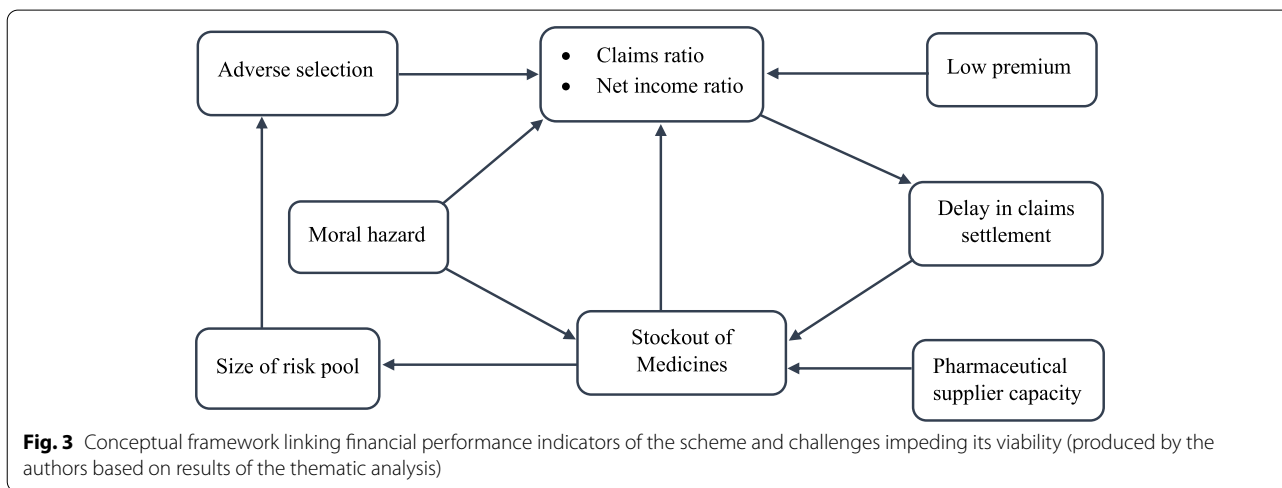
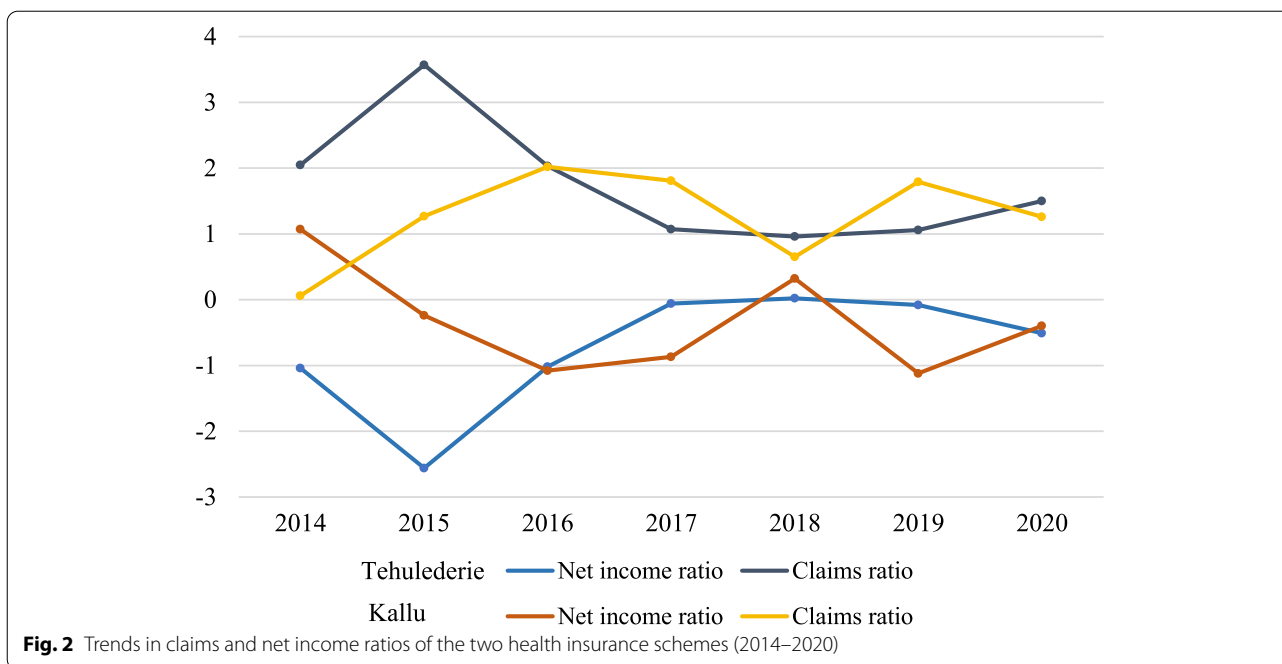
(\$313,466.97) was recorded before subsidies, and 893,275 ETB after subsidies. Figure 1 displays the trends in claims costs of the scheme in contrast to contributions from members and government subsidies. To display the trends, we converted revenues and expenditures to US dollars using the exchange rate on the last business day of each fiscal year, allowing us to examine the actual change in revenues and claims costs over time.

Claims and net income ratios

The trends in claims and net income ratios of the two schemes are displayed using Fig. 2. In Tehulederie health insurance scheme, the claims ratio was 2.05 in the 2014 reporting year, which meant that for every 1.00 ETB of contribution received from members, on average, the scheme spent 2.05 ETB on claims. The ratio increased to 3.57 in 2015 and fell again to 2.03 and 1.07 in 2016 and 2017, respectively. A claims ratio of less than 1.00 (0.96) was documented only in 2018. This means that the scheme office spent more than it received in the settlement of claims in all the periods under the study, except in 2018, as a result, the net income remained negative in all these periods. The average claims ratio over the period under study was 1.50, while the average net income ratio was -0.50 (ranging from -2.56 in 2015 to 0.02 in 2018).

The claims ratio in Kallu health insurance scheme increased sharply from 0.06 in 2014 to 1.27 in 2015 and to 2.02 in 2016. The ratio dropped slightly to 1.81, 1.79 and 1.26 in 2017, 2019 and 2020, respectively, with a significant decline to 0.65 in 2018. The average claims ratio over the period under study was 1.34. The scheme experienced a loss in all the reporting periods, except in 2014 and 2018. The average net income ratio was -0.47 (ranging from -1.13 in 2019 to 0.99 in 2014).





Challenges to financial viability

Although each case study district is evaluated as a separate implementation of CBHI, combining interview findings from the two case studies allows for the identification of common themes. Based on analysis of the qualitative data, five main themes were identified, which are adverse selection, moral hazard behaviors, frequent stockout of medicines, delays in claims settlement for service providers, and low insurance premiums. Figure 3 depicts the conceptual framework that links the scheme’s financial performance indicators to the underlying challenges identified through the thematic analysis.

Adverse selection

The study’s participants were interviewed to explore which parts of the community are more willing to enroll in CBHI and adhere to it. High-risk individuals, such as those with a chronic conditions like hypertension and diabetes, people with a disease that requires advanced surgical procedures, as well as the elderly, are more inclined to join and stay with the scheme. Without being mobilized, such households urge the scheme administrators to renew their subscription. Healthy households, on the other hand, have no desire to enroll or renew their subscription. Surprisingly, they re-enroll in the system

after dropping out if they develop a chronic disease or medical issue that requires more expensive treatment, and they quit again when they no longer require health care.

"I was a member of health insurance, I enrolled because my father had a chronic illness. I thought it would be useful to treat him, but now he is dead, hence I quit my health insurance." (IF1, previous member).

"People with chronic illness need to renew and pay the premium on time. The insurance scheme went bankrupt due to the high claims cost of such members." (KII-16, scheme personnel).

Households with a large size are also more inclined to participate in the scheme. Furthermore, according to the study participants, partial enrollment of family members who need more health care is widely practiced in the community among households with more than five people to avoid additional premiums per individual. Another related issue is that two families attempt to be covered under health insurance as if they were one family, and enroll individuals with higher health care needs. Moreover, although members of the scheme are expected to pay additional premiums for each non-core family member, this is not enforced in the study districts. As a result, the schemes are unable to collect the necessary contributions from their subscribers. This was mainly due to the fact that the family structure that existed since the introduction of health insurance was not revised.

"There may be relatives who live nearby, people who can agree, and sick people from both families would be selected and enrolled as one family. They attempt to be members in this way in our Kebele." (KII-19, Kebele leader).

Moral hazard behaviors

Patient moral hazard Following the implementation of CBHI, there has been an increase in the use of health services in general. Aside from that, the key informants revealed that insurance members engage in a variety of moral hazard behaviors that undermine the scheme. The most prominent is returning to a health facility for the same ailment repetitively without following through on a treatment plan. Patients who are unable to obtain the medications they want mostly return within one to three days of treatment. Even some came back in the afternoon or at night after being treated in the morning, assuming that another care provider would meet their desires. Such clients usually encounter health care providers unless

their medication is modified in accordance with their wishes.

This practice has been inextricably linked to the waste of medicines. When insured patients are not treated as they expect, some throw their medications and go away in a rage, while the majority receive the medications, but not take as prescribed. As a result, most insured people have medicines stored in their homes. This is one of the main reasons for medicine stockouts at health centers, according to health care providers. Overall, insured patients tend to request health care providers prescribe the medications they want and write a referral letter to a hospital regardless of their condition. They try to exert undue pressure on them to get whatever they want, because they believe they are entitled to any health care under the terms of their insurance.

"They think that they would be better off with a single dose, and if they are not getting improved, they come back immediately without completing medicines. There is a tendency for people to press us to write prescriptions in any way they wish." (KII-10, health care provider).

Other moral hazard behaviors include seeking medical attention for every minor ailment, leaving the health center unattended after retrieving medical cards when the waiting time is long, bringing the other family to a health center for a checkup while one is sick, attempting to collect medicines for the uninsured, visiting different health centers for the same illness within the same period, attending health care facilities ahead of time for follow-up appointments to reserve medicines for use when coverage expires, and in case of medicine stockouts or to share with someone who is not covered by health insurance. The latter is common among patients seeking chronic follow-up care, especially when medicines are scarce at contracted health facilities.

"Insured patients visit health facilities for minor cases, because of having health insurance. This is one of the reasons for the financial loss of the scheme. ...they receive treatment at one health care facility today, and then transfer to another without seeing the results of that treatment. On the third day, they see it again and go to another health center." (KII-16, scheme personnel).

"...a patient visited the health center for five business days in a row, from Monday to Friday. He was given different medicines everyday he came in. Why was he doing that? Surprisingly, some clients present

with the symptoms of uninsured individuals, and collect medicines for them.” (KII-3, health care provider).

“They keep hypertension medicines at home, they come here to receive more, and inform you that they have finished the previous one...they may return before the treatment is completed to have a reserve.” (KII-9, health care provider).

Some key participants indicated that after receiving medicines from a health center, insured patients are caught selling them to private pharmacies. On the contrary, some of them stated that such a behavior was common during the early stages of the program, and they do not expect it to happen nowadays, because medicines are even unavailable for their treatment.

Provider moral hazard Moral hazard behaviors are not exclusive to insurance beneficiaries. According to key informants, some health care providers were involved in practices that entail moral hazard. These behaviors include ordering expensive medicines and laboratory or imaging services, over-prescription (prescribing antibiotics while it is not required), and prescribing medicines intentionally for a patient without completing what has been supplied before.

“Doctors consider treatments as a luxury if a patient is insured. Patients who are insured are given more services than they need. For example, ordering a CT scan when an ultrasound is adequate to make a diagnosis. This is really happening. Doctors are doing this because they believe it will benefit patients, as diagnosis will be easier.” (KII-3, health care provider).

A key informant who was working as a medical auditor also disclosed that doctors in hospitals write prescriptions for uninsured patients in the name of the insured. When uninsured patients cannot afford medical care, doctors write prescriptions in the names of insured patients admitted to the same ward. Doctors have even been accused of prescribing medicines for one another in the name of a patient with health insurance.

“When they want to help someone who is unable to pay, they prescribe extra medicines for the insured and administer to the uninsured. They write the required prescriptions on behalf of the insured patient. This is a common practice at hospitals.” (KII-3, health care provider).

Unless health facilities are thoroughly audited, the scheme will be liable for extra claim costs *due to service providers’* practices. As revealed by scheme personnel, some health facilities claim service charges for treatments that are not offered, for exempted health services, and for patients from other districts.

Medicines stockout

The most common issue expressed by all participants was a shortage of medicines. Because medicines were often unavailable in contracted health facilities, prescriptions were issued to insurance cardholders to buy at private pharmacies, forcing them to make OOP spending or forego treatment if they couldn’t afford it. The severity of the problem was also fully understood by health care providers in both districts. A budget shortfall and limited capability of the governmental pharmaceutical supplier prompted medicine shortages in health facilities. Study participants stated that the public pharmaceutical supplier has a restricted capacity to address the needs of health care institutions in its target areas. Because the pharmaceutical supplier regularly run out of medical products, health care providers have been forced to purchase from private wholesalers, which requires a complex process with large price markups, restricting the amount of medicine required to deliver care. In addition, health facilities must sell medicines to patients at a higher price, which may have an impact on the scheme’s claim costs.

“... however, medicines are not available in health facilities. We are always told to buy it somewhere else. If we rely on our health insurance book and go to a health facility without having money in our pockets in time, we will be in trouble especially during an emergency. However, because we do not trust health insurance and have cash on hand, we buy medicines from private institutions.” (IDI-1, current member).

“... There was another patient admitted to the hospital. Several medicines were prescribed by his doctors, but he was unable to obtain them from the hospital pharmacy. Regrettably, he arrived at the hospital without cash, relying solely on his health insurance card. He eventually left the hospital without receiving any treatment.” (IFI, current member).

“... Last year, our health centers were about to close due to a shortage of medicines.” (KII-1, district health officer).

Claims settlement delays

According to both health care providers and scheme personnel, a delay in claims payment for health care providers is another impediment to successful scheme

performance. Contracted health facilities were working for a longer time without getting paid for the services they give to insured patients. Earlier, health facilities were not reimbursed for service charges for the entire fiscal year. As a result, they frequently ran out of medicines and other supplies, and in some cases, they were unable to offer essential health services and forced to shut down the entire operation. Due to claims payment delays, the referral hospital also declined to sign a contract agreement with the scheme. The scheme personnel also stated that this has been the biggest challenge in the implementation of the scheme since its introduction in both districts. Due to the scheme's budget shortfall, both district administrations had to pay medical bills out of their own budget in addition to the expected subsidy.

"Health centers have come down financially since the introduction of health insurance. Why? Because the health insurance does not reimburse them for the services they provide on time. As a result, they were unable to buy medicines, they were forced to send patients away, and unable to serve the community as a whole." (KII-1, district health officer).

"We did not reimburse the referral hospital for the service charges last year, because we could not afford to pay all the claims. As a result, patients were denied to receive medical care." (KII-15, scheme personnel).

Some health facilities also complained that their claims were partially rejected after a medical audit. The scheme administrators acknowledged the issue, stating that service charge claims are partially denied as a result of different audit findings, a problem that occurs frequently in some health facilities. Requesting payment for services not covered by the scheme, such as exempted health services, mathematical errors, asking payment for clients from other districts and patients whose names are not on the scheme's list of members, claiming service charges for treatments not offered, and the same medicine re-ordered for one patient within the same period, are some of the audit findings that result in service claims being rejected. As revealed by scheme officials, they did not undertake medical audits as planned; nonetheless, if they had conducted a comprehensive medical audit, the rejection rate might have been higher than stated.

"We are not reimbursed for the services we offer within the agreed-upon time frame. As a result, we were unable to procure medicines on time. When the payment is made, it's only a small amount of money, because what we claimed is partially rejected. This is the biggest problem we faced." (KII-2, health center director).

Low insurance premiums

The low rate of premiums, according to research participants, is one factor contributing to the scheme's financial shortfall. Despite the fact that some segments of the population find it difficult to pay, scheme participants agree that the current premiums are low in comparison to the cost of medical care.

"Obviously, the funding is insufficient. Our health insurance premiums are a one-time payment for a single visit. When someone sneezes, they go to a health center." (IDI-2, current member).

"Some people find it difficult to pay the premium. However, in terms of health insurance scheme, it is negligible. It is inadequate to cover the costs of health services." (KII-18, Kebele leader).

Discussion

This study examined the scheme's financial viability using key indicators, and explored its challenges from the perspectives of various stakeholders. Results from the quantitative data showed that both schemes experienced a higher claims ratio during the period under study. The scheme in both districts spent more than it received for claims settlement in almost all the period under the study, as a result, they experienced heavy losses in these periods. Even after subsidies, the scheme's net income remained negative (for three and four fiscal years in Tehulederie and Kallu districts, respectively). As shown by Fig. 1, the scheme did not experience losses in 2014 (Kallu) and in 2018 in Both districts. It has to be fleshed out more, especially in the Kallu district. In Kallu district, the scheme was launched in July 2013 and was not fully functional in terms of service delivery, except for creating awareness and enrolling households. Furthermore, people may be unaware of how to utilize their insurance cards for health care and how to submit claims, which could explain the low claims cost in 2014. In this district, claim costs fell considerably in 2018, and sharply rise and reach its peak in 2019. Although there could be some other explanations, one likely reason could be a delay in claims reimbursement. Some service provider claim payments may not have been made on time in 2018, but were repaid in 2019.

A high claims ratio indicates how valuable the program is to the insured, but if it is higher than predicted, the scheme may be about to fail, leading to a decline in financial protection. Furthermore, persistently negative net income values may indicate that the program requires certain adjustments to become viable [33]. Rising claims cost is a common issue in voluntary health insurance systems. Consistent with our finding, other studies reported claims ratios ranging from 4.3 to 18.1

in Ghana's national health insurance, which was too high than expected [42, 43].

As explored by the qualitative part of the study, adverse selection, moral hazard behaviors, and unavailability of medicines at contracted health facilities are all possible reasons for higher claims costs. The findings revealed that households with higher health care needs are showing more interest in enrolling and staying in the scheme, implying adverse selection. Patients also had a tendency to drop out of the program as soon as their illnesses were alleviated. Even people who have dropped out of the scheme opt to re-enroll if they require health care with a high treatment cost. To prevent adverse selection, membership units were set at the household level instead of at individual level. However, this was not adequately enforced in practice. As a result, partial enrollment of family members who need more health care is broadly practiced in the community. In line with our findings, studies in Ghana and China revealed that adverse selection was fairly widespread, and it was seen as a major threat to the long-term viability of health insurance [17, 19, 20]. It was especially common among partially enrolled households in China [19]. Other studies in Uganda and Ghana found that healthy people choose to terminate their insurance policies since they were not benefiting from the scheme, implying adverse selection [21–24].

Risk cross-subsidization (cross-subsidy from the healthier to the less healthy) is the underlying principle of voluntary community health insurance schemes [8]. However, in the event of adverse selection where the healthy are left out, risk cross-subsidization would be diminished because most members would consume health care that costs more than their contribution, leading to higher claims costs for the scheme. This study also revealed that the scheme's financial loss was partially attributed to the fact that people with chronic illness are more represented in the scheme than healthy individuals. Hence, strategies must be devised to attract more members in order to improve the scheme's risk redistribution ability. Adverse selection pertaining to partial enrollment can be prevented by firmly enforcing the obligation to enroll all household members. For households that re-enroll in the scheme after dropping out, a waiting period during which benefits are not available can be imposed. This would make it more likely for healthy people to keep their membership or enroll in the scheme in order to avoid unforeseeable future risks.

The study also identified a variety of moral hazard behaviors that are indicative of scheme abuse, which include repeated visits to a health facility for the same illness, storing medicines at home, seeking medical attention for every minor ailment, attempting to collect

medicines for the uninsured, visiting different health centers for the same illness within the same period, and attending health care facilities ahead of time for follow-up appointments to reserve medicines. Our findings were corroborated by the evaluation findings of the Ethiopian pilot schemes [31]. A study in Ghana also documented most of these moral hazard behaviors [28]. Although moral hazard has been argued to generate welfare and equity gains in health insurance [44], which may be true in some instances in this study, the majority of the behaviors observed are welfare losses. Most of the practices are undesirable to both individuals and the overall health insurance system. Unnecessary repeat visits, for example, lead to a shortage of medicines in health facilities, forcing other members to make OOP spending at the point of service use. The scheme must also cover any excess claims costs incurred as a result of overconsumption, as well as high price markups at private pharmacies. To avert a rising claims cost due to patient moral hazards, the scheme should consider certain limits on the number of visits in a given period. It has been stated that some moral hazard practices are linked to a lack of community understanding of health insurance principles. Raising awareness of the concept of solidarity is also paramount for encouraging insured people to change behaviors that undermine the scheme. To limit visits to different health centers for the same illness and period, Kallu district has implemented cluster level treatment, in which patients are required to receive care only at one health center. Although this may fix the problem, it infringes on the rights of insurance cardholders to seek treatment at health centers where they believe the care is of better quality. When one health center runs out of medicines, for example, they would have to go to another health center.

The findings revealed that two or more households are covered under health insurance as if they are one, and those with higher health care needs are only partially enrolled, an issue involving both adverse selection and moral hazard. To avoid this situation, scheme and *Kebele* administrators should strive to revise the family structure that has existed since the start of health insurance.

The study also revealed some moral hazard behaviors among health care providers, such as ordering expensive medicines and laboratory or imaging services, over-prescribing, and writing prescriptions for uninsured patients in the name of insured patients. Behaviors including over-prescription of services, prescribing medicines with similar effect at the same time, prescribing the same medicine repeatedly, and unnecessary referral to private wings were also reported during the pilot phase evaluation in Ethiopia [31]. Similarly, a study in Ghana documented a number of moral hazard behaviors on the

part of service providers which include overprescribing, overcharging for drugs and services provided to clients, charging for services not provided, as well as inflating the number of clients served [28]. To overcome some of these practices, the scheme should consider replacing the existing fee-for-service payment mechanism with a capitation model, which is an efficient method in controlling over-servicing and operational costs, especially in primary care settings [45].

Unavailability of medicines at CBHI-affiliated health facilities is another issue that jeopardizes the scheme's financial viability. This is consistent with studies done elsewhere, which reported that a scarcity of medicines is a common source of concern among insured patients at contracted health facilities [23, 24, 46–50]. Due to the unavailability of medicines, insured patients were forced to buy from private pharmacies at higher price markups. The scheme must reimburse for OOP expenses made at private pharmacies for services that might have been delivered at contracted health facilities for a much lower cost. As a result, claims reimbursement for insurance members has become a substantial cost driver, thereby endangering the scheme's financial stability. Moreover, medicines are an essential component of high-quality care, and their scarcity in health care facilities would result in greater dissatisfaction among insured patients, limiting the size of risk pools.

It is worth noting that the scheme's high pocket money replacement indicated that it fell short of its purpose of protecting members from OOP spending at the point of health care. People who cannot afford to pay for health care at private institutions would also have limited access, as the only other option would be to forego treatment. This is supported by the fact that a shortage of medicines at contracted health facilities is largely due to the scheme's inability to settle claims on time. Although an increase in annual revenue of health centers has been documented during the pilot phase of CBHI in Ethiopia [51], this is not the case in the study districts. Health centers have experienced a financial setback after the introduction of the scheme. Although health care facilities mainly rely on claims payments to acquire supplies, many have been unable to meet their obligations due to considerable reimbursement delays. It has been revealed elsewhere that, due to claims payment delays, service providers have been forced to stop attending to insurance cardholders and issue prescriptions to buy medicines outside contracted hospitals [23, 24, 29, 30, 32]. A recent study in Ghana corroborated this finding, noting that delays in claim reimbursement have left health facilities with huge debts, making it difficult for them to operate [52].

We have noticed that a delay in claims settlement has been linked to medicine stockouts at contracted health facilities as both a cause and a consequence. In order to break the vicious circle that links scheme budget deficits, claims settlement delays, and medicine shortages, improving the capacity of government pharmaceutical supply should also be a priority. The low rate of insurance premiums in relation to the cost of health care has been highlighted as one important factor in the scheme's financial deficiency. This is consistent with the results of earlier studies [30, 32]. The fact that earned premiums are lower than claim costs in most of the financial reports partly suggest that revenues from beneficiary contributions are insufficient to cover the health care costs.

This is common in low-income countries like Ethiopia, where the bulk of the CBHI target population are subsistence farmers who cannot afford even small premium rates [8]. While there will undoubtedly be concerns about the poor and most disadvantaged being left out, the health insurance premium should be managed to increase. Because government subsidies are determined as a percentage of earned insurance premiums, raising the premium level is also essential to increase government subsidies. To determine the base premium, however, more research on the community's willingness and ability to pay is required. This must, however, be done after efforts have been taken to improve the quality of health care, particularly in terms of medicine availability. Despite the study provides useful insights into voluntary health insurance schemes, it is not without limitations. First, due to a lack of records, we were unable to determine the promptness with which health care providers' claims were settled, which would have allowed us to contrast against the stipulated timeframe. Second, the use of secondary data might not accurately reflect real financial status. Third, the study covered two CBHI schemes in two districts of northeastern Ethiopia. This limits the generalizability of the findings beyond the two case study settings. As a result, more research is recommended to examine the financial viability of the CBHI scheme in a broader geographical area using additional financial performance indicators.

Conclusions

The scheme in both districts spent more than it received for claims settlement in almost all the period under the study, and experienced heavy losses in these periods, showing that it is not financially viable. The scheme was unable to protect members from OOP spending at the point of health care, and was unable to provide a reliable source of financing for health facilities. This can be attributed to a variety of issues. The main concerns that caused the scheme's claims costs to escalate

were adverse selection, notably partial enrollment, moral hazard behaviors, and unavailability of medicines in health facilities. Although health care facilities rely mainly on claims payments to acquire necessary supplies, they were unable to meet their obligations due to significant delays in reimbursements. The delay in claims settlement was exacerbated by the low insurance premium in relation to the costs of health care. All of these will undermine the scheme's financial equilibrium unless the necessary actions are taken. Adverse selection pertaining to partial enrollment can be prevented by updating the family structure and firmly enforcing the obligation to enroll all household members. To avert a rising medical bills due to patient moral hazards, the scheme should consider limits on the number of visits in a given period. Raising awareness of the concept of solidarity is vital to persuading insured people to change their anti-scheme behaviors. Moreover, policymakers should make steps to improve the quality of health care, especially in terms of medicine availability. Overall, the findings of this study will be valuable in deploying improvements in the study districts, as well as other places with common operating systems. It will give essential information for policymakers as they strive to revise scheme designs and establish higher-level pools.

Abbreviations

CBHI: Community-Based Health Insurance; ETB: Ethiopian Birr; HEW: Health Extension Workers; IDI: In-Depth Interviews; IFI: Informal Field Interviews; KI: Key Informant Interviews; OOP: Out-of-Pocket; UHC: Universal Health Coverage.

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Authors' contributions

MH conceptualized the study, designed the study, collected the data, analyzed and interpreted the data, and drafted the manuscript. MA and NBB contributed to survey design, data collection and analysis, reviewed and validated the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Institutional Review Board of the College of Medicine and Health Science, Bahir Dar University. To secure entry permission into the study sites, a support letter was communicated to the district health offices. Verbal informed consent was secured from each study participant. Interviews were audio recorded with the permission of the participants.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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