ESSAYS ON EVALUATING A COMMUNITY BASED HEALTH INSURANCE SCHEME IN RURAL ETHIOPIA

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207905-L-bw-ISS

This dissertation is part of the Research Programme of CERES, Research School for Resource Studies for Development.

Funded by the Netherlands Organisation for Scientific Research (NWO-WOTRO), grant number W07.45.103.00.

Printed in The Netherlands.

ISBN 978-94-91478-31-4

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Essays on Evaluating a Community Based Health Insurance Scheme in Rural Ethiopia

Essays over het evalueren van een programma voor zorgverzekeringen op gemeenschapsbasis op het platteland in Ethiopië

Thesis

to obtain the degree of Doctor from the
Erasmus University Rotterdam
by command of the Rector Magnificus
Professor dr H.A.P Pols
and in accordance with the decision of the Doctorate Board

The public defence shall be held on
10 June 2015 at 16.00 hrs

by

Anagaw Derseh Mebratie
born in Debre Markos, Ethiopia

207905-L-bw-ISS

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207905-L-bw-ISS

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Acronyms

ARI	Acute Respiratory Infections
CBHI	Community Based Health Insurance
CSA	Central Statistical Authority
DiD	Difference-in-difference
ETB	Ethiopian Birr, the currency of Ethiopia
FGD	Focus group discussion
FMoH	Federal Ministry of Health
HH	Household
IV	Instrumental Variables
KII	Key informant interview
MLN	Multinomial logit
NGOs	Non-governmental Organization
OLS	Ordinary Least Squares
OOP	Out-of-pocket
PSM	Propensity score matching
PSNP	Productive Safety net Programme
SAH	Self-assessed health status
SD	Standard deviation
SES	Socioeconomic status
SNNPR	Southern Nations, Nationalities, and Peoples' Region
SSA	Sub-Saharan Africa
USAID	United States Agency for International Development

Acknowledgements

This thesis would not have been possible without the contribution and support of a number of individuals and organizations. First and foremost, I would like to express my gratitude to my promoter Prof. Dr. Arjun S. Bedi for his unreserved effort in the course of conducting this study and for allowing me to develop a career in research. While I was finalizing my MA research paper at ISS, he forwarded a very nice question 'Anagaw, are you interested in a PhD?' This was a question that opened a door for me to join an impressive research group and to gain valuable knowledge and experience in development research. While working on my thesis, I was more focused on producing the essays as sooner as possible, rather than on giving due attention to the quality of the papers. Hence, I gave Arjun a hard time as he coached me step by step on how to write papers with scientific and policy relevance. His friendly, thoughtful, and inspiring approach has encouraged me to aim higher. Thus, he deserves my heartfelt appreciation.

I am also very grateful to my co-promoter, Dr. Robert Sparrow, for his invaluable comments and brilliant suggestions, which helped in bringing the thesis to its current state. I would also like to thank Robert for organizing a session on 'Health Care Financing Reforms and their Effects in Sub-Saharan Africa: Case Studies from Ethiopia, Togo, Rwanda and Burundi' at the 9th World Congress of the International Health Economics Association held in Australia and for inviting me to present a paper. This was a good opportunity not only to enhance my experience by participating in an international conference, but also to visit beautiful Sydney and to see kangaroos ☺. I would also like to thank my co-authors and research team members, Dr. Getnet Alemu, Dr. Ellen van de Poel, Zelalem Yilma (*expected dr* ☺), Dr. Degenet Abebaw, Dr. Maleen Dekker, and Dr. Admasu Shiferaw, who have contributed immensely to my thesis: the team has been a source of good advice, collaboration, and friendship. I am very satisfied with what we have achieved together. My gratitude also goes to the examiners Dr. Wendy

Janssens, Dr. Natascha Wagner and Wameq Raza for their time going through the draft of this thesis and their insightful comments and suggestions. The thesis also benefited from constructive comments from conference participants, who are acknowledged in each essay.

I would like to extend my gratitude to the Netherlands Organisation for Scientific Research (NWO-WOTRO) for funding this research project through grant number W07.45.103.00. I am also indebted to the Ethiopian Economics Association (EEA) and the Organization for Social Science Research in Eastern and Southern Africa (OSSREA) for providing institutional support during the data collection, editing, and entry. I am also truly grateful for them for hosting me and providing necessary research materials while I was in Ethiopia for fieldwork. I am particularly thankful to Dr. Assefa, Prof. Pascal, Alemayehu, Daniel, Mesfin, Hassen, Belete, Dr. Abiy, Medihanit, Mistre and Etalemaw. The contributions of Ethiopian Ministry of Health, Ethiopian Health Insurance Agency, Abt Associates Inc., CARE Ethiopia, and CBHI coordinators in Tigray, Amhara, Orimiya and SNNP regions were also instrumental in providing the required primary and secondary data. Informants, enumerators and supervisors also deserve thanks for participating and cooperating in the data collection process.

I greatly appreciate the follow up and encouragement I got from EDEM research group especially Prof. Dr. Peter van Bergeijk, Prof. Dr. Mansoob Murshed, Marja Zubli, Annet van Geen, Dr. Jan van Heemst, and Dr. John Cameron. I am grateful to all administrative staff in ISS for their practical support throughout my postgraduate studies. I would particularly like to acknowledge Ank, Susan, Martin, Grace, Dita, Paula, Veronika, John, and Robben. I am also indebted to Linda and Almas for their valuable contribution to improve my academic writing and presentation skills.

Not to be forgotten are a number of people who contributed one way or another to the completion of this thesis: Binega, Bilisuma, Dessalegn, Endrias, Sylvanous, Farid, Woinshet, Habtamu, Kefale, Genet, Hailemariam, Mequanint, Tesfaye, Deribe, Tegegn, and Terefe. I enjoyed useful discussions and spent wonderful time with my PhD colleagues at ISS including Fasil, Lucas, Biniam, Zaman, Kenji, Zemzem, Wilson, Tsegaye, Angelica, Rao, Farzane, Tefera, Tamara, and Cynthia. My words of appreciation also goes to members of the Ethiopian Orthodox church in Pernis and my good friends I met in the Netherlands Tameru, Aster, Getachew, Shirin, Genet, Netrapal, Hiwot, Paloma, Goitom, Ermias, Vivi, Claudette, and Hana for making my stay in the Netherlands relaxing and joyful.

A special thanks to my dear mother Abebu, my father Derseh, my brother Wondwosen, my sister Elsa as well as to Abebaw, Dasash, and Azaria for their moral support and encouragement, which motivated me to keep pursuing my studies.

Abstract

Since the late 1990s, in a move away from user fees for health care and with the aim of creating universal access, several low and middle income countries have set up community-based health insurance (CBHI) schemes. Following this approach, in June 2011, with the aim of enhancing access to health care and reducing the burden of out-of-pocket health care expenditure, the Government of Ethiopia rolled out a pilot CBHI scheme. The scheme caters to rural households and urban informal sector workers in 13 districts located in four main regions (*Tigray, Amhara, Oromiya,* and *SNNP*) of the country. The main aims of this thesis are to assess the factors that drive initial scheme uptake and contract renewal and to identify the impact of CBHI on utilization of care and financial protection. As a prelude to an assessment of these issues, the thesis also provides a systematic review of the literature on CBHI schemes and uses five clinical vignettes to assess the demand for modern health care in rural Ethiopia. The thesis uses data obtained from various sources: three waves of a household panel survey, a health facility survey and qualitative information gathered through focus group discussions and key informant interviews.

Analysis of the responses to the clinical vignettes suggests that the low rates of healthcare utilization in Ethiopia are not linked to lack of awareness of the symptoms of the most common diseases or a low-perceived need for health care but are driven by healthcare costs. The analysis also suggests a clear justification for the introduction of schemes such as the CBHI.

Turning to the scheme itself, as compared to the experience of other African countries, the uptake rate in the Ethiopian CBHI has been remarkable. Within two years of scheme operation, uptake reached 48 percent. At the same time, 82 percent of insured households renewed their subscriptions, and 25 percent of those who had not enrolled in the first year joined the scheme a year later. The empirical analysis shows that the pilot scheme does not exclude households in the lowest socioeconomic status. However, households in the second and third consumption quintiles are less likely to

renew their membership status. This difference is most likely due to the availability of fee waivers and other social support which is available to the poorest households. Membership in a productive safety net programme (PSNP) which targets chronically food insecure households is associated with a 31 percentage point increase in initial enrolment and a 9 percentage point reduction in drop out. PSNP members attended more CBHI meetings before scheme introduction and have greater scheme knowledge and in some cases they have also been coerced to join the scheme.

Unlike the experience of other Sub Saharan African countries, adverse selection is not found to be a serious concern. This is perhaps due to scheme design - while scheme membership is voluntary, enrolment is permitted only at the household level. Furthermore, while accessing health services through the scheme boosts scheme retention and raises concerns about adverse selection there is no evidence that health status differs between those who remain in the scheme and those who have not joined the scheme. Scheme roll-out was preceded by intensive insurance awareness campaigns and the analysis shows that awareness of health insurance and knowledge of the scheme boost scheme retention. The study also finds that, as may be expected, the quality of care on offer influences the decision to join the health insurance scheme.

While concerns about the quality of care and the differential treatment provided to the insured remain, the programme is found to be effective in creating access to health care services. Participation in the scheme is associated with a 30 to 41 percent increase in the incidence of outpatient health care utilization and a 45 to 64 percent increase in the frequency of visits to public providers. While the effect of the scheme on out-of-pocket health care expenditure is unclear, scheme enrolment is associated with more than a 50 percent reduction in the cost per visit to public facilities.

The overall evidence leads to the conclusion that there is a high demand for the scheme and its returns are generally positive. There appear to be three broad sets of factors that contributed to the success of the programme. First, scheme implementation was preceded by a number of steps which perhaps laid the needed ground work. These steps included rapid expansion of health post and health extension services which helped create a preference for modern care and enabled identification of health problems. The roll-out of the insurance was preceded by investments in the quality of health care and an intensive awareness campaign which provided knowledge about the basic principles of health insurance. Second, the premium has been set at a level that is affordable for the bulk of households and there are

very few restrictions in terms of the range of health services that are covered. Finally, unlike the situation in a number of other Sub-Saharan African countries, the pilot scheme in Ethiopia is part of existing government structures and scheme performance (at least in terms of uptake and retention) is an element used to measure the performance of the local administration. This clearly provides incentives to implement and support the scheme. It does seem that the Ethiopian CBHI has the potential to meet some of the goals of universal health coverage.

Essays over het evalueren van een programma voor zorgverzekeringen op gemeenschapsbasis op het platteland in Ethiopië

Samenvatting

Sinds eind jaren 90 zijn er in een aantal landen met een laag tot modaal inkomensniveau zorgverzekeringen op gemeenschapsbasis (community-based health insurance of CBHI) opgezet die tot doel hadden om gezondheidszorg gratis en voor iedereen toegankelijk te maken. In navolging hiervan heeft de Ethiopische overheid in juni 2011 een proef-CBHI opgezet om gezondheidszorg toegankelijker te maken en uitgaven voor gezondheidzorg die uit eigen zak moet worden betaald te beperken. De deelnemers aan deze verzekering zijn huishoudens op het platteland en mensen die in de stad in de informele sector werken uit dertien districten in vier hoofdregio's (Tigray, Amhara, Oromiya, en SNNP). Dit proefschrift is in de eerste plaats bedoeld om de factoren die bepalen of mensen de verzekering afsluiten en hun polis vernieuwen te achterhalen en om de invloed van CBHI op het gebruikmaken van zorg en op financiële bescherming vast te stellen. Daarnaast biedt het proefschrift ook een systematisch overzicht van de literatuur over CBHI-programma's. In het onderzoek worden vijf klinische vignetten gebruikt om de vraag naar moderne gezondheidszorg op het platteland in Ethiopië in kaart te brengen. De data voor het onderzoek zijn verzameld in een panelstudie onder huishoudens die in drie rondes is uitgevoerd en in een survey-onderzoek naar gezondheidszorgvoorzieningen, en er is kwalitatieve informatie verzameld in focusgroepsdiscussies en interviews met sleutelpersonen.

De resultaten van de klinische vignettenstudie wijzen erop dat het geringe gebruik van gezondheidszorg in Ethiopië niet samenhangt met een gebrek aan bewustzijn van de symptomen van de meest voorkomende ziekten of met een geringe waargenomen behoefte aan gezondheidszorg, maar het gevolg is van de kosten van gezondheidszorg. Uit de analyse blijkt duidelijk dat de invoering van programma's zoals CBHI gerechtvaardigd is.

Als we naar het programma zelf kijken, blijkt dat er in vergelijking met andere Afrikaanse landen in Ethiopië opmerkelijk vaak aan CBHI wordt deelgenomen. Binnen twee jaar was de deelname al 48 procent. Tegelijkertijd schreef 82 procent van de verzekerde huishoudens zich opnieuw in, en 25 procent van degenen die het eerste jaar nog niet meededen, schreven zich een jaar later in voor het programma.

Uit het empirisch onderzoek blijkt dat huishoudens met de laagste sociaal-economische status ook deelnemen aan het proefproject. Huishoudens in het tweede en derde consumptiekwintiel vernieuwen hun lidmaatschap echter minder vaak. Dit verschil is waarschijnlijk te verklaren door het feit dat de armste huishoudens geen lidmaatschapsgeld hoeven te betalen en ook andere vormen van sociale steun krijgen. Lidmaatschap van een productief vangnetprogramma (productive safety net programme of PSNP) dat bestemd is voor huishoudens met chronische voedselonzekerheid gaat samen met een toename van 31 procent in aanvankelijke deelname en 9 procent minder uitval. PSNP-leden woonden meer CBHI-bijeenkomsten bij voor het programma ingevoerd werd en weten meer over het programma. In sommige gevallen worden ze ook gedwongen om deel te nemen.

Anders dan in andere Afrikaanse landen ten zuiden van de Sahara is er nauwelijks sprake van averechtse selectie. Dit ligt mogelijk aan de opzet van het programma: het lidmaatschap is vrijwillig, maar inschrijving is alleen mogelijk voor huishoudens en niet voor individuen. En hoewel toegang tot gezondheidszorg via het programma bevordert dat mensen blijven deelnemen en vragen oproept over averechtse selectie, zijn er geen aanwijzingen voor verschillen in gezondheidstoestand tussen degenen die blijven deelnemen aan het programma en degenen die niet deelnemen. De invoering van het programma werd voorafgegaan door een intensieve campagne om mensen bekend te maken met verzekeringen en uit het onderzoek blijkt dat de bekendheid met zorgverzekeringen en kennis van het programma bevordert dat mensen blijven deelnemen. Verder blijkt uit het onderzoek, zoals te verwachten, dat de kwaliteit van het zorgaanbod van invloed is op de beslissing om deel te nemen aan het zorgverzekeringsprogramma.

Hoewel de kwaliteit van de zorg en een verschillende behandeling van de verzekerden een punt van zorg blijven, blijkt het programma een effectieve methode om de gezondheidszorg toegankelijk te maken. Deelname leidde tot een toename van 30 tot 41 procent in het gebruik van poliklinische gezondheidszorg en een toename van 45 tot 64 procent in de frequentie van bezoeken aan openbare aanbieders. Hoewel het effect van het programma op uitgaven voor gezondheidszorg die uit eigen zak wordt betaald niet

duidelijk is, gaat deelname aan het programma samen met een reductie van meer dan 50 procent in de kosten per bezoek aan openbare voorzieningen.

Op grond van de resultaten kan geconcludeerd worden dat er veel vraag is naar het programma en dat het in het algemeen rendabel is. Drie factoren lijken ten grondslag te liggen aan het succes van het programma. Ten eerste is de invoering van het programma voorafgegaan door een aantal maatregelen waardoor mogelijk het benodigde voorwerk is gedaan. Deze maatregelen omvatten een snelle uitbreiding van gezondheidscentra en gezondheidsvoorlichting, wat heeft bijgedragen aan een voorkeur voor moderne gezondheidszorg en waardoor gezondheidsproblemen konden worden vastgesteld. De invoering van de verzekering is voorafgegaan door investeringen in de kwaliteit van de gezondheidszorg en een intensieve bewustwordingscampagne waarin de grondbeginselen van een zorgverzekering werden uitgelegd. Ten tweede is de premie vastgesteld op een voor het gros van de huishoudens betaalbaar niveau en zijn er weinig beperkingen in de gedekte zorgvoorzieningen. Ten slotte maakt het proefproject in Ethiopië, anders dan in een aantal andere Afrikaanse landen ten zuiden van de Sahara, deel uit van bestaande overheidsregelingen en wordt het functioneren van programma (in ieder geval wat betreft inschrijving en continuering van deelname) gebruikt om het functioneren van het lokale bestuur te beoordelen. Dit is een duidelijke stimulans om het programma te implementeren en te steunen. De Ethiopische CBHI lijkt het potentieel te hebben om een aantal doelen van gezondheidszorg voor iedereen te verwezenlijken.

1 Introduction

In the 1980s and early 1990s, a number of developing countries introduced *user fees* in order to access health care services. While such schemes increased the availability of health facilities and improved the quality of services, at least to some extent (Ndiaye et al., 2007; Carrin et al., 2005) they also created financial barriers (Jutting, 2004; Wiesmann and Jutting, 2000; Xu et al., 2003).

Since the late 1990s, due to the financial difficulties associated with the imposition of user fees, a number of low and middle income countries have introduced community-based health insurance (CBHI) schemes. CBHI schemes are a hybrid between traditional risk sharing and market based formal insurance arrangements (Ahuja and Jütting, 2004). Like traditional risk management systems, CBHI schemes are local initiatives built upon the principles of social solidarity and common benefits to provide financial protection against the impoverishing effects of health expenditure (Ahuja and Jütting, 2004; Tabor, 2005; Jacobs et al., 2008). Similar to formal insurance, CBHI members are expected to pay a premium. However, the basic difference between CBHI schemes and formal insurance arrangements is that the latter aims at profit maximization, and therefore premiums are fixed above the expected risk level of individuals, whereas CBHIs are non-profit organizations, and therefore the premium is based on the average risk profile of the community as a whole (Ahuja and Jütting, 2004). Unlike market based insurance institutions, members of CBHI schemes are expected to participate in design, administration, and supervision activities in order to enhance trust and self-ownership to the scheme (Carrin et al. 2005, Jacobs et al 2008).

The existing studies tend to show that CBHIs are effective in extending access to outpatient healthcare services while there is mixed evidence on the capacity of such schemes to provide protection against out-of-

pocket healthcare spending (Gnawali et al., 2009; Hamid et al., 2011, Nguyen et al., 2011). However, such healthcare financing approaches also have drawbacks. Often CBHI schemes are characterized by low coverage and high drop out rates (Ito and Kono, 2010; Mladovsky, 2014; Basaza et al., 2009). Moreover, there is evidence that the poorest are often excluded from enrolment as they cannot afford the premium (Diop et al., 2006; Lammers and Warmerdam, 2010). Even when they enrol in the scheme, they are less likely to use healthcare services due to co-payments, transportation costs and forgone income (Ekman 2004, Msuya et al., 2007). Additionally, enrolment in such schemes is voluntary and those with poor health status are more likely to be attracted to the scheme compared to those with good health status which raises concerns about scheme sustainability (Wang et al., 2005; Dror et al., 2005, Wiesmann and Jutting 2001).

Following the proliferation of CBHI initiatives, there has been a growing empirical literature on the impact of such schemes on various outcomes such as utilization of care and financial protection against healthcare spending. However, from a methodological point of view, the empirical evidence remains limited in terms of establishing causal effects. The bulk of the existing empirical studies tend to rely on cross section data collected after the intervention and fail to control for unobserved factors which may affect both outcomes and CBHI uptake. Due to the voluntary nature of membership, such schemes may attract those with poor health status and/or relatively better off households who can afford membership (Diop et al., 2006; Gnawali et al., 2009; Lammers and Warmerdam, 2010). Except for a few studies (such as Zhang & Wang, 2008; Yip et al., 2008; Levine et al., 2012), the existing empirical studies do not account for such self-selection behaviour in enrolment decisions which in turn may lead to over- or under estimation of the effect of the schemes on outcomes. Moreover, while a number of studies control for access to care, they do not control for quality of care which may determine demand for care and health insurance.

In terms of access to modern health care and various other health indicators, Ethiopia ranks low even as compared to other Sub Saharan African countries.[1] For instance, the 2014 Global Multidimensional Poverty Index (MPI) report ranks Ethiopia 107th on acute multidimensional poverty indicators among 108 countries (Oxford Poverty and Human Development Initiative, 2014). Life expectancy is 63 years while the under-

five mortality rate stands at 68 per 1000 live births and the maternal death rate at 420 per 100,000 live births (World Bank, 2012). According to a report produced by the Ethiopian Federal Ministry of Health (2006), between 60 to 80 percent of illnesses occur due to preventable diseases and conditions such as malaria, tuberculosis, pneumonia and lack of proper nutrition. Despite such a high disease burden, between 2000 and 2011, outpatient health care service utilization per person per year has only marginally increased from 0.27 visits to 0.3 visits. In 2011, no antenatal care was provided to 66 percent of pregnant women, and 90 percent of births were not attended by skilled health personnel. In the same year, for children under age 5 with acute respiratory infection (ARI), 93.2 percent did not take antibiotic treatment and 90.5 percent of children with fever were unable to access antimalarial drugs (WHO, 2012).

Both supply and demand side constraints contribute to the low health care utilization of Ethiopia. In 2009, the number of hospital beds per 10,000 people was 2 (while the average availability for Sub Saharan African (SSA) region was 9), the number of nurses and midwives per 10,000 population was 2 (11 for SSA) and that of physicians (generalist and specialist medical practitioners) was only 0.4 (2 for SSA) (WHO, 2010). Per capita total health expenditure on health at an average exchange rate for the year 2010 was USD 15 (USD 89 for SSA) which is less than half of the USD 44 per capita recommended by World Health Organization to provide essential healthcare services (WHO, 2013). The three main sources for financing the Ethiopian health system are international development assistance from bilateral and multilateral donors (40 percent), out-of pocket health spending by individuals (37 percent) and the public budget (21 percent). Because of high reliance on OOP health care spending, coping with health shocks could be catastrophic for households particularly for the ultra-poor. Due to limited access to a well-developed health insurance system, only about 2 percent of private healthcare expenditure was covered by private insurance institutions, which is very low compared to other Sub-Saharan African countries like Kenya (8.8%), and Benin (7.3%), Senegal (17.9%) (WHO, 2012).

In the recent past, to increase access to modern health care services and to improve the health status of the population, the government has focused on supply side interventions such as providing health extension services at the village level and expanding healthcare facilities and medical colleges. For instance, between 2000 and 2012, the number of health

posts increased 19 fold (from 833 to 15,668) and the number of health centres expanded by 8 times (356 to 2,999). In the same period of time, the number of public and private hospitals increased from 103 to 125 (FMoH, 2012). As a result of such supply side investments, primary healthcare coverage, as measured by the availability of health posts and health centres at village level (*Kebele*) has increased from 51% in 2000 to 93% in 2012 (FMoH, 2012). In order to address demand side constraints, the government of Ethiopia has recently designed two types of health insurance schemes: a mandatory health insurance scheme catering to formal sector workers and a voluntary Community Based Health Insurance (CBHI) for the rural population and urban informal sector workers.

The mandatory social health insurance scheme is expected to be launched in the second half of 2014. Since June 2011, the voluntary CBHI scheme has been rolled out on a pilot basis in 13 districts located in four main regional states (*Amhara, Tigray, Oromiya and SNNPR*).[2] Within two years of operation, the scheme has expanded to cover about half of the target households (147,491 households comprising 656,215 individuals). The uptake rate is impressive compared to the experience of other Sub Saharan African countries which have introduced CBHI schemes. For instance, CBHI uptake in Nigeria was 6 percent after one year (Lammers and Warmerdam, 2010), 35 percent in Rwanda after seven years and 85 percent after nine years (Shimeles, 2010), 4.8 percent in Senegal after two years (Smith and Sulzbach, 2008), 11.4 percent in Mali after six years (Diop et al., 2006), 2.8 percent in Tanzania after six years (Chee et al., 2002). The government plans a nationwide scale up the programme after analysing the experience of the pilot intervention. Currently, in addition to the existing 13 districts, the pilot scheme is in the process of being expanded to 161 districts. The idea is to gain more experience before scale up and to inform the final design of the scheme (FMoH, 2013).

In view of the aforementioned background, the general objectifies of this thesis are to: (i) provide an updated and systematic review of literature on CBHI schemes (ii) examine health care seeking behaviour in rural Ethiopia (iii) investigate enrolment in Ethiopia's pilot community based health insurance scheme (iv) examine the impact of this scheme on healthcare utilization and financial protection (v) identify the factors that influence drop out decision from the scheme. In order

to do so, the study draws on three rounds of a household panel survey, canvassed in twelve CBHI pilot districts and four control districts with similar characteristics as the pilot districts. The household survey includes a baseline survey conducted just before the start of the CBHI program in 2011, and two follow up surveys conducted in 2012 and 2013. The baseline survey includes 1,632 randomly selected households comprising 9,455 individuals. The second round of the survey includes 1,599 households and the third round of data resurveyed 1,583 (3% attrition) of the households that had been canvassed in the first round. The study also uses a health facility survey canvassed before the introduction of the scheme in 2011 and it covers 48 randomly selected health centres (3 health centres from each of the 16 districts).

In addition, the qualitative information obtained from the above mentioned surveys is supplemented by the qualitative data gathered through key informant interviews (KIIs) and focus group discussions (FGDs). Qualitative information was conducted after one year of the scheme operation in 2012. Fifteen interviews were conducted with policy makers and implementing bodies at Federal Ministry of Health (FMoH), Abt Associates, Care Ethiopia, four regional level CBHI coordinators, four district level CBHI officials and four village level CBHI managers from each of the pilot region. Eight Focus group discussions, two in each of four villages randomly selected per region, were conducted with scheme members and non-members. KIIs aim to understand the rationale behind introducing CBHI and the selection of specific implementation approaches while FGDs focus on the understanding of health insurance and perception of the target households about the benefit of the scheme. The thesis consists of five interrelated essays.

The first essay reviews the existing empirical evidence on access to CBHI schemes and their effect on the use of health care services and financial protection. The review also evaluates the influence of scheme design on outcomes and comments on the research methods used in the existing papers. The essay relies on 46 studies which have been published between 1995 and 2012 and covers a range of low and middle income countries. Unlike a narrative review, this study uses pre-specified review protocol to develop stylized facts on different outcomes of interest. The results obtained from this review provide a foundation to address the research questions raised in the other essays which comprise the thesis.

The second paper provides insights on the extent to which the low utilization rate of health care services in the country is explained by poor awareness of health problems or low perceived need for modern care in rural Ethiopia. The paper uses five context specific hypothetical clinical vignettes to examine healthcare seeking behaviour and attempts to answer three questions: Will households seek care when they face a particular health problem? Conditional on seeking care, what type of care is used (modern vs traditional; public vs private; lower vs higher level care)? When do they seek care? The study is based on the household survey round conducted prior to the introduction of the pilot CBHI scheme.

The third essay attempts to explore CBHI uptake in relation to socioeconomic status, pre-existing health status, and health service characteristics (in terms of geographical distance to the facility and quality of the available care). The essay focuses on CBHI uptake in its first year, using the baseline and first follow up surveys and a health facility survey. The analysis is complemented with qualitative information collected through focus group discussions with the members of CBHI target communities and key informant interviews with policy makers and implementing bodies. Unlike previous studies, in order to account for the endogenous nature of some of the explanatory variables to the outcome, the CBHI enrolment status of the households in the current period is examined as a function of different socioeconomic factors in the previous period.

The fourth essay evaluates the impact of CBHI on use of outpatient healthcare services, financial protection against the adverse effects of household OOP health expenditures, and cost of care. The analysis exploits all three rounds of the panel dataset. The availability of a baseline and two follow up surveys offers an opportunity to conduct a credible impact evaluation and provide empirical evidence on the potential role that may be played by such CBHI schemes in meeting the goal of universal access to healthcare.

The final essay examines the role of several sets of factors such as scheme affordability, access to and quality of care, awareness and understanding of health insurance, and scheme-specific knowledge, scheme use and experience in explaining CBHI drop out. The essay relies on the two follow up household surveys and information from health facilities. Qualitative information is used to interpret the findings of the regression results.

The final chapter of the thesis summarizes the key findings from the five essays, describes policy implication of the findings, and assesses scheme sustainability and budget implication of a nationwide scale up of the program.

Notes

[1] Ethiopia is the second most populous country in Africa with an estimated population of 88 million in 2014 with 83% of its inhabitants living in rural areas (CSA, 2014). Per capita income of the country stands at USD 410 and about 31 percent of the population survives on less than $1.25 a day (World Bank, 2012)

[2] Together, these four main regions account for about 86 percent of the country's population (Population Census Commission, 2008).

2 Community-Based Health Insurance Schemes: A Systematic Review[1]

Abstract

Due to the limited ability of publicly financed health systems in developing countries to provide adequate access to health care, community-based health financing has been proposed as a viable option. This has led to the implementation of a number of Community-Based Health Insurance (CBHI) schemes, in several developing countries. To assess the ability of such schemes in meeting their stated objectives, this study systematically reviews the existing empirical evidence on three outcomes – access to schemes, effect on health care utilization and effect on financial protection. In addition to collating and summarizing the evidence we analyse the link between key scheme design characteristics and their effect on outcomes and comment on the role that may be played by study characteristics in influencing outcomes. The review shows that the ultra-poor are often excluded and at the same time there is evidence of adverse selection. The bulk of the studies find that access to CBHI is associated with increased health care utilization, especially with regard to the use of relatively cheaper outpatient care services as opposed to inpatient care. The schemes also appear to mitigate catastrophic healthcare expenditure. There are clear links between scheme design and effectiveness suggesting the importance of involving the target population in designing and implementing CBHI schemes.

2.1 Introduction

Increased expenditure caused by the need to cope with injury and illness has been identified as one of the main factors responsible for driving vulnerable households further into poverty (WHO, 2000). According to

Meghan (2010), more than half of health expenditure in poor countries is covered by out-of-pocket (OOP) payments incurred by households. An increase in such expenditure can have catastrophic effects and may deplete a household's ability to generate current and future income and have inter-generational consequences as households may be compelled to incur debt, sell productive assets, draw down buffer food stocks, or sacrifice children's education. Foregoing medical care may lead to long lasting illness, disability or even death (see O'Donnell et al., 2005; De Weerdt and Dercon, 2006; Flores et al., 2008).[2]

Since the late 1990s, due to the limited ability of publicly financed health systems in developing countries to provide adequate access to health care and the shortcomings of informal coping strategies to provide financial protection against health shocks, in the international development discourse (for instance see WHO, 2000) various forms of community-based health care financing have been proposed as an alternative approach.[3] This increasing policy attention has led to the implementation of a number of Community-Based Health Insurance (CBHI) schemes, in several developing countries (Wiesmann and Jutting, 2001; Defourny and Failon, 2008). Typically, such CBHI schemes are non-profit initiatives built upon the principles of social solidarity and designed to provide financial protection against the impoverishing effects of health expenditure for low-income households in the informal urban sector and in rural areas (Ahuja and Jütting, 2004; Carrin et al. 2005; Tabor, 2005; Jacobs et al., 2008).

Matching the roll-out of these schemes, theoretical and especially empirical studies which examine their impact on outcomes such as utilization of healthcare, financial protection, resource mobilization and social exclusion have proliferated. Existing reviews of this body of work are provided by Jakab and Krishnan (2001), Preker et al. (2002) and Ekman (2004). Based on 45 published and unpublished works, Jakab and Krishnan (2001) conclude that there is convincing evidence that community health financing schemes are able to mobilize resources to finance healthcare needs, albeit there is substantial variation across schemes. They also argue that the schemes are effective in terms of reaching low-income groups although the ultra-poor are often excluded.[4] Preker et al. (2002), reach a similar conclusion and point out that there is strong evidence that CBHIs are successful at mobilizing resources, enabling access to care for the poor and providing financial protection.

Although both these papers paint a positive picture of the potential of CBHIs in meeting their policy goals they also point out the need for stronger evidence on the performance of CBHIs as long-term viable health care financing instruments. As opposed to these two narrative reviews, Ekman (2004) provides a systematic review of the literature based on 36 studies conducted between 1980 and 2002.[5] Ekman (2004) finds that while CBHI do provide financial protection for low income groups and increase cost recovery for health service providers the magnitude of the effect is low and the lowest income groups are excluded from enrolment. Moreover, there is no evidence that the schemes are associated with an increase in the quality of care. On a methodological note, Ekman (2004) concludes that the evidence base to develop stylized facts is questionable and only five studies included in his review may be considered of high-quality.[6] These studies are labelled high-quality studies primarily as they attempt to use econometric methods, albeit on cross-section data, to identify the effect of CBHI on various outcomes.

Motivated by the continued attention given to such schemes as a way of financing health care, the aim of this review is to provide an updated and systematic assessment of studies that have examined the impact of CBHI schemes, and on the basis of this body of evidence take stock, among other issues, of the role of such schemes in enhancing access to health care and providing financial protection. The paper relies on 46 micro level studies that have been published or have become publicly available between 1995 and 2012 and cover a range of low and middle income countries. Unlike the previous reviews, the current study focuses mainly on papers that have used quantitative methods to identify impact.[7] The specific objectives of the study are to: (i) examine the impact of CBHI on inclusion of lower income groups and adverse selection in enrolment, on healthcare utilization and on OOP expenditure (ii) examine the extent to which variations in outcomes may be related to key scheme design characteristics – an issue which has policy implications but which has not been systematically investigated (iii) scrutinize the research methodology of the various studies and comment on the potential effects of the study design on the empirical findings.

The paper unfolds by providing, in section 2, a description of the key characteristics of some common types of community based health insurance schemes. This is followed by an account of the protocol used to produce the review (section 3), findings are in section 4, and a discussion

of methodological concerns appears in section 5. The final section concludes the paper.

2.2 Community-based health insurance – a brief taxonomy

Community-based health insurance is a generic term for a variety of resource mobilization models designed to finance access to health care through a greater involvement of the target population in the design and implementation of the scheme as compared to private or national-level health insurance schemes (for details see Jakab and Krishnan, 2001; Preker et al., 2002).

The most common forms of community health financing schemes are (i) Community prepayment health organizations (ii) Provider based health insurance and (iii) Government-run but community-involved health insurance. These schemes differ in terms of design and the involvement of the community in setting up the scheme, mobilizing resources, management and supervision. The remainder of the section characterizes these different schemes and highlights the role of the community in each scheme type while Table 2.1 provides a snapshot of various scheme characteristics.

Table 2.1
Features of different CBHI models

	Type of CBHI scheme		
	Community prepayment health organizations	***Provider based health insurance schemes***	***Government- run community-involved health insurance***
Design features	Financed by contribution from members Small financial contribution mainly to cover primary health care services Membership is on a voluntary basis	Designed by local health care providers (hospitals) to encourage service utilization Often cover expensive inpatient care Membership is on a voluntary basis	Designed by governments as part of the health financing system Often includes both primary care and hospitalization Membership may voluntary or mandatory

	Type of CBHI scheme		
	Community prepayment health organizations	***Provider based health insurance schemes***	***Government- run community-involved health insurance***
Management features	Strong community involvement in decision making and supervision	Providers involved in scheme management	Schemes are organized and managed through a top-down approach by central and local governments but the community may also be involved in decision making processes
Organizational and institutional features	The provider is not involved in the administration of the scheme The schemes may sign contractual agreement with local providers to obtain preferential prices and insure quality of services	Providers administer the schemes and collect premiums from scheme members Providers may obtain technical assistance from the government and NGOs	Governments are strongly involved in the design, implementation, and evaluation of the scheme.
Role of government and NGOs	NGOs often provide technical assistance and provide start-up funds Governments provide legal recognition and encourage their establishment	NGOs and governments may improve the facility of the providers	Government and NGOs may subsidise the scheme and provide exemption from premium payment for lower income groups
Role of the community	Pay premiums All round community involvement in design, implementation and supervision	Pay premiums Provide feedback on quality	Pay premiums Communities may be involved in design and administration of the schemes
Strong side of the scheme	Trust and feeling of ownership	Does not require management and technical skills from the community Scheme management and service provision are integrated	The possibility of subsidized premiums Large size of scheme and enhanced sustainability

	Type of CBHI scheme		
	Community prepayment health organizations	***Provider based health insurance schemes***	***Government- run community-involved health insurance***
Weakness of the scheme	Small size in nature and low ability to pool enough resources Lack of technical and managerial skills about health insurance administration	Limited scale Relatively low power of the community to influence benefit package and quality of care	Limited feeling of community- ownership Potentially high administrative costs

Source: Adapted from Jakab & Krishnan (2001), Arhin-Tenkorang (2001) and Ekman (2004)

2.2.1 Community prepayment health organizations

These types of health organizations are characterized by voluntary membership and payments are made in advance in order to cover potential medical costs. Members of the schemes pay premiums on a regular basis, usually when their incomes are high. Such schemes are often initiated with the technical and financial support of NGOs and thereafter the community takes full responsibility for administering and managing the scheme. Local governments may also play a role in encouraging and supporting the efforts of such schemes. The community participates in designing the scheme and decides on the level of benefit and the corresponding premium. In addition, members participate actively in administration and supervision (Arhin-Tenkorang, 2001).

Sixteen studies in the current review examine the impact of community prepayment health organizations (see Table A2). While such schemes often rank high in terms of community involvement they tend to cover a limited geographical area and often cover only cheaper outpatient care services due to difficulties associated with mobilizing a large enough population. While community involvement is a purported strength of this approach it is also a weakness as the establishment and continuity of such schemes depends on social solidarity and trust amongst community members.[8] Poor management and accounting skills may also undermine the sustainability of such schemes.

2.2.2 Provider based health insurance schemes

These types of health insurance schemes are initiated by healthcare providers (such as a town or regional hospitals) to encourage utilization of healthcare services. This review contains seven studies which may be placed under this rubric (see Table A2). The schemes mainly cover expensive inpatient care and hospitals and may have recourse to external funds to subsidize service costs. In this framework, the health care providers are responsible for mobilizing resources and providing health care services. The role of the community in designing and administering the scheme is limited. However, members of the schemes are given a chance to participate in scheme supervision and provide feedback on service quality through meetings organized by the health care providers. Such schemes are often restricted to those households living in the catchment area of a health facility (see Arhin-Tenkorang, 2001).

2.2.3 Government run community-involved health insurance

Government run and community-involved health insurance schemes are often linked to formal social insurance programmes with the objective of creating access to a universal health care system (Jakab and Krishnan, 2001). Unlike other models, government initiated schemes often cover both basic curative and inpatient care. The government (national or regional) plays a substantial role in initiating, designing and implementation of such schemes (Arhin-Tenkorang, 2001). The participation of the community in such schemes varies substantially across countries. Some governments create conditions which enable community involvement in defining the benefit package, setting of premiums and scheme management while others introduce the schemes in a top-down manner and limit the role of the community. Membership in such government-initiated health insurance may not always be voluntary. Twenty five studies in this review fall in the category of government-run models of community health insurance schemes.[9]

Unlike other forms of CBHI, government supported health insurance schemes have the potential to reach a relatively large number of households. Governments in co-operation with donor agencies may provide reductions in premium and fee waivers for the poorest segments of society while retaining a universal benefit package. The disadvantage of these schemes may lie in their design and implementation features. Since such

programmes are the result of a top-down approach, they may not be sensitive to local needs. Limiting the role of community participation in awareness-raising, decision-making and supervision probably robs such schemes of a sense of ownership which in turn may hamper sustainability.

2.3 Conducting the review

This study applies the basic principles of a systematic review in order to assess the literature on the impact of CBHI schemes.[10] Unlike a narrative approach, systematic reviews attempt to assess the overall message or develop stylized facts on the basis of knowledge emerging from existing studies while at the same time controlling for or commenting on methodological features of the literature that may influence the conclusions. The protocol followed in this review is as follows:

1. The specific research aim was defined as a review which will provide a synthesis of the existing knowledge on community health financing approaches in dealing with three issues - access to schemes or social inclusion, and their effect on health care utilization and financial protection.
2. Source of the data: published and unpublished papers over a 18 year period (1995 to 2012) located through a search of 6 databases — Econlit, PubMed, Science Direct, SSRN, JSTOR, and Google scholar. In addition, a search was conducted on the web pages of the World Health Organization.[11]
3. To identify papers for review a search was conducted using the key words 'community health financing', 'micro-insurance', 'OOP payment and community insurance', 'community-based health insurance'. This generated a large number of papers (several hundred) whose titles and abstracts were examined and introductions and conclusions were perused for suitability of inclusion. Using this approach, 121 potential papers were selected and passed to the second round for intensive reading.
4. Papers included for detailed review needed to satisfy the following criteria:
   - 4.1 They should be concerned with an examination of the impact of community health financing schemes on access to health care and financial protection. The definition of

'community health financing schemes' was restricted to non-profit oriented schemes that serve populations in the informal sector (urban or rural) of low and middle income countries.[12] This restriction led to the exclusion of 21 of the 121 papers.

4.2 Studies that use micro data at the household or individual level (led to the exclusion of 12 studies).

4.3 Studies that evaluate the effect of community health insurance mainly using quantitative and statistical analysis. Studies relying mainly on qualitative studies were included provided they used at least some statistical information (16 studies excluded).

4.4 Studies that arrived at their findings based on value judgement and self-perception without using any data were excluded. Similarly, studies that did not provide clear information on the research methods applied and the schemes studied in their analysis were excluded (7 studies excluded).

4.5 The outcome measures should include utilization of health care (outpatient and inpatient) services, OOP healthcare payments, adverse selection, and social exclusion in enrolment and service utilization (19 studies excluded).

The imposition of these criteria led to a list of 46 papers (32 published and 14 unpublished) that were retained for the review.[13] Compared to Ekman (2004), 37 of the papers included in the review are different.

5. After paper selection, the papers were read and carefully scrutinized. A data extraction template was developed to collect information from each paper about scheme impact, the characteristics of the scheme (type of scheme, whether the scheme receives external support, whether there are contracts with providers, extent of community participation), the statistical/research methods applied, data characteristics (source, level of analysis, data type, the use of baseline information). A summary of the key features of each of these studies is provided in Table A2.

6. Analysis: The limited number of studies impedes a formal meta analysis which links outcomes to scheme characteristics and study characteristics. However, to assess the overall message emerging from the studies, univariate and bivariate distributions were constructed. These are used to construct stylized facts.

2.4 Review results

The key data emerging from the review are laid out in Tables 2.3 to 2.6. A brief discussion on each of the issues under scrutiny is provided below.

Table 2.2
Effect of CBHI on outcomes

Outcome	*Schemes displaying an effect*		
	%	*N*	*Total*
Utilization	74.3	26	35
Outpatient care	75.0	9	12
Inpatient care	64.3	9	14
OOP healthcare payment	56.3	9	16
Catastrophic OOP	85.7	6	7
Social exclusion	61.1	11	18
Adverse selection	66.7	6	9

Notes: Effect indicates whether the studies find (i) statistically significant and positive effects of CBHI schemes on utilization of health care (ii) statistically significant effects in terms of reducing OOP payment (iii) whether the poor are statistically less likely to access CBHI and (iv) whether those with existing ill-health conditions are statistically more likely to access CBHI.

2.4.1 Participation, social exclusion and adverse selection

Scheme participation, which is linked to cost-recovery, varies considerably across schemes and also within schemes across different sites. The largest scheme included in the survey covers 406 million individuals while the smallest includes only 600. Scheme coverage as a share of the target population, for the schemes that provide such information, ranges from 1 percent to 100 percent. The unweighted mean is 37.2 percent

(see Table A2). While this may not seem impressive, the uptake rate has to be viewed against the intended target for such schemes (rural and informal sector workers) and their potentially limited exposure to insurance/financial services.

Turning to the issue of who participates, a majority of the papers (61 percent) find statistically significant evidence to support the claim that the ultra-poor are excluded from CBHI schemes. Even when such households become members, they tend to use healthcare services less intensively as compared to higher income groups potentially due to their inability to afford co-payments and other related costs (transportation and forgone income). About 67 percent (see Table 2.2) of the studies find evidence that individuals suffering from chronic health conditions are more likely to join CBHI schemes as compared to those in good health. While this may be expected and considered a positive aspect from the perspective of the beneficiaries, it also signals the need to account for such risks in the management of CBHI schemes. To control for adverse selection a number of schemes allow enrolment only at the household rather than the individual level and/or promote group registration at the village level. Other schemes introduce a waiting period before new members can receive assistance in order to discourage opportunistic scheme uptake (Wiesmann and Jutting, 2001).

2.4.2 Utilization of healthcare services

Consistent with the results of previous reviews our analysis shows that 74 percent of the studies (26 out of 35) find positive and statistically significant CBHI membership effects on health care utilization.[14] The effect differs across the type of health care services and supports the idea that such schemes are somewhat more effective in extending access to outpatient as compared to inpatient care – 75 percent of the studies find an effect on outpatient care while the corresponding figure for inpatient care is 64 percent. In terms of magnitude, the increase in outpatient care utilization for insured versus uninsured ranges from 4.3 to 10.5 percentage points and for inpatient care utilization from 1.1 to 6.9 percentage points. While the utilization of preventive and curative outpatient care may reduce the need for inpatient care (Yip et al., 2008) it is likely that the difference in the CBHI effect across types of care is due to differences in coverage for the two types of services. Several CBHI schemes do not cover both types of care and if they do, inpatient care coverage

has a high co-payment arrangement which is like to dissuade health care use.

2.4.3 Financial protection

Sixteen studies have examined the impact of the schemes on out-of-pocket payment and seven papers looked at the effect of the schemes on catastrophic health expenditure. 56 percent of such studies conclude that the schemes have been successful at reducing OOP healthcare payments and in 86 percent of the cases in preventing catastrophic health expenditure. For those papers where the effect is statistically significant, the reduction in OOP expenditure ranges between 12 to 35 percent.

2.4.4 Scheme characteristics and scheme effects

A clear feature emerging from the analysis is the high degree of variation in outcomes across schemes. The pertinent policy issue is perhaps not so much whether CBHI schemes enhance access and provide financial protection but what are desirable scheme design features. This is difficult to analyse as details on scheme design are not readily available, however, we attempt to do so by providing a tabulation of various scheme characteristics and their associated effects on the outcomes of interest (see Table 2.3).

Table 2.3
The effect of scheme characteristics on outcomes

	Scheme displaying an effect[a]								
	Utilization			*OOP Payment*			*Social Exclusion*		
	%	*N*	*Total*	*%*	*N*	*Total*	*%*	*N*	*Total*
Scheme Type:									
Gov't	78.6	11	14	75.0	6	8	85.7	6	7
Community	68.8	11	16	42.9	3	7	50.0	5	10
Provider	75.0	3	4	0.0	0	1	0.0	0	1
External fund[b]									
Support	81.0	17	21	66.7	6	9	63.6	7	11
No support	75.0	3	4	50.0	1	2	100	3	3
Contract with providers									
Signed agreement	82.6	19	23	63.6	7	11	63.6	7	11
No agreement	100	1	1	0.0	0	0	75.0	3	4
Community participation									
Part. in design[c]	100	9	9	80.0	4	5	75.0	3	4
Not part. in design	54.5	6	11	25.0	1	4	66.7	4	6
Part in implementation[d]	100	7	7	100	2	2	33.3	2	6
Not part. in implementation	64.3	9	14	28.6	2	7	66.7	6	9
Microfinance linked schemes[e]	83.3	5	6	50.0	1	2	0.0	0	4

Notes: [a]Effect indicates whether the studies find (i) statistically significant and positive effects of CBHI schemes on utilization o f health care (ii) statistically significant effects in terms of reducing OOP payment and (iii) whether the poor are statistically less likely to access CBHI. [b]External fund indicates any financial support to the scheme from governments or any development organization in order to (partially) cover administrative costs or to provide subsidized premiums. [c] Participation in design stage indicates that the target population was given a chance to participate in the establishment of CBHI schemes.[d] Participation in implementation indicates that members of the community are involved in managing and supervising schemes.[e] Schemes that are linked to existing microfinance services.

Scheme type

There appears to be a clear link between scheme type and outcomes. Government-run community-involved schemes appear to be less effective in terms of reaching out to marginalized groups as compared to community pre-payment schemes. Six of the 7 government-schemes tend to exclude the ultra-poor as compared to 5 of the 10 community-run NGO-supported schemes. Consistent with this pattern the studies show that government-run schemes are somewhat more successful (11 out of 14) at ensuring health care use (conditional on enrolment) as compared to community-run (11 out of 16) schemes. We also find that government-run insurance interventions are more effective in providing financial protection for beneficiaries, although this does not account for the exclusion of the ultra-poor.

External financing

CBHIs differ in their financing source. Some schemes are entirely dependent on member contributions while others receive external funds in order to ensure financial sustainability and to subsidise premiums for potential beneficiaries. Access to such funds appears to be positively associated with increase in utilization (17 out of 21) and reduction in OOP expenses (6 out of 9). Schemes with external support seem to be less effective in terms of reducing social exclusion (only 4 out of 11 studies with external funds finds a reduction in the inclusion of the poor). This pattern suggests that subsidies are benefiting the relatively wealthier members of the community and highlights the need for more effective targeting of such funds. While access to external support may have a short-run beneficial effect, continued reliance on such subsidies may undermine the sustainability of such schemes.

Contract with providers

While some community health financing schemes do not place restrictions on obtaining medical treatment from health providers in a given geographical area others sign contracts with local providers and restrict access. Such arrangements may lead to price discounts although their effect on quality of care is not so clear. The review suggests that such contractual agreements increase utilization of health care and reduce the burden of OOP payments. Since almost all the schemes under

review have signed agreement with providers it is hard to discern a provider effect.

Community participation

In principle it would seem redundant to examine the link between community participation in community-based health financing as the target population is expected to be engaged in various aspects of such schemes. However, as discussed in section 2, the extent to which potential beneficiaries participate in the design, implementation, management, and supervision activities varies across schemes. Providing space for community participation may have an impact on the willingness of individuals to buy insurance and the overall performance of the scheme. The review reveals that participation of the community in design and implementation has a positive impact on healthcare utilization and financial protection. For instance, all 9 schemes in which communities have a role in programme design are associated with an increase in access to healthcare and 4 out of 5 display a reduction in OOP expenditure. The corresponding figures for schemes without such participation are 6 out of 11 and 1 out of 4 for utilization and OOP expenditure, respectively. Participation of members in management and supervision activities is also linked with increases in access to healthcare service (7 out of 7) as opposed to 9 out of 14 for schemes where members are not involved.

Link with microfinance institutions

As discussed above, several microfinance institutions provide micro insurance service for their members. Six studies in this review evaluate the impact of CBHI schemes which are embedded in microfinance institutions.[15] Albeit the number is small, such schemes appear to be effective in terms of expanding utilization and in ensuring equitable access to health insurance.

2.5 Methodological concerns

So far the information and in particular the estimates obtained from the CBHI literature have been taken at face value. However, a reading of the papers raises at least two concerns, especially if the aim is to identify the causal impact of the schemes on various outcomes.

First, in the case of most CBHI schemes, enrolment is voluntary and there is clear evidence of exclusion of the ultra-poor and the higher en-

rolment of individuals with existing medical conditions. However, many studies not account for this pattern of self-selection and hence ignores the consequences of estimating the impact of CBHI on health care use and financial protection based on self-selected samples. Without accounting for this pattern of self-selection it is difficult to argue that the estimates of CBHI on health utilization and financial access should be interpreted as causal effects.

To provide a systematic assessment along this dimension, Table 2.4 groups the methods used in the reviewed studies into four categories. These consist of studies that (i) Control for potentially confounding observed and unobserved factors that may influence program outcomes and scheme uptake using techniques such as difference-in-difference (DiD), Instrumental Variables (IV), and Heckman selection models (ii) Studies that have used econometric analysis (Propensity Score Matching, OLS, logit, probit) to control for a number of potentially confounding observed variables that may influence outcomes and scheme uptake (iii) Studies that have analysed differences in means of outcome variables across insurance status and tested whether these are statistically significant (iv) Studies that have analysed differences in means without conducting any statistical test. Only 6 of the 43 estimates on utilization, the most widely used outcome, fall in the first category. The most common approach is to control for a range of observed characteristics which may have a bearing on outcomes and on scheme uptake (19 of 43 in the case of health utilization) but to ignore (unobserved) selection effects. The upshot is that, potentially, most of the studies in the review are likely to overestimate the effect of CBHI on utilization (since the analysis is based on samples predisposed to using more health care) and underestimate the financial protection effect (sample excludes the ultra-poor).

Table 2.4
Research methods

Method	*Utilization*		*OOP health expenditure*		*Social Exclusion*		*Adverse selection*	
	%	*N*	*%*	*N*	*%*	*N*	*%*	*N*
DiD/ IV/Heckman[a]	14.0	6	29.4	5	10.5	2	27.2	3
Logit/ PSM/Probit/OLS[b]	44.2	19	58.8	10	63.2	12	54.5	6
Descriptive with statistical test	23.3	10	5.9	1	21.1	4	0.0	0
Descriptive without statistical test	18.6	8	5.9	1	5.3	1	18.2	2

Notes: [a] DiD-Difference-in-differences, IV - Instrumental variables; [b] PSM - Propensity score matching, OLS - Ordinary least squares.

Second, the bulk of the studies rely on a single or repeated cross-section data for their analysis. Only 6 of the 25 studies on health utilization that apply regression methods have used panel data and 5 of these studies use baseline information (Table 2.5). Access to longitudinal data is important from a policy and a methodological perspective. Access to such data permits dynamic analyses and are essential to gauge the long-term feasibility of such schemes. At the same time longitudinal information makes it easier to control for unobserved heterogeneity/selection effects which may have a bearing on outcomes and enrolment.

Table 2.5
Study characteristics and outcomes (only studies that apply regression analysis)

Study characteristics	*Utilization*		*OOP health expenditure*		*Social Exclusion*		*Adverse selection*	
	%	*N*	*%*	*N*	*%*	*N*	*%*	*N*
Data type								
Cross-section	76.0	19	86.7	13	85.7	12	66.7	6
Panel	24.0	6	13.3	2	14.3	2	33.3	3
Baseline information	20.0	5	13.3	2	14.3	2	33.3	3

Notes: The following papers rely on panel data and baseline information to examine utilization, Yip et al. (2008), Levine et al. (2012), Lu et al. (2012), Wagstaff et al. (2009), and Xuemei and Xiao (2011); OOP health expenditure, Levine et al. (2012) and Wagstaff et al. (2009); Social exclusion, Zhang and Wang (2008) and Chen and Yan (2012); Adverse selection, Zhang and Wang (2008), Parmar et al. (2012), and Chen and Yan (2012).

Based on his review, Ekman (2004) concluded that, "overall, the evidence base is limited in scope and questionable in quality" and only 5 of the 36 papers reviewed were considered high quality. Since then there has been a clear improvement in the quality of the literature. For instance, 25 of the 43 studies on utilization now use statistical regression analysis, an important marker of quality in Ekman's quality assessment protocol. However, the burden of proof needed to obtain convincing effects has also risen since 2004. Based on current standards a convincing causal analysis of interventions such as the CBHI calls for the use of baseline and follow up data, information on treatment and valid control groups and the use of appropriate statistical methods to control for the endogenous nature of CBHI participation. The current review shows that while still a minority, studies with such characteristics is increasing. Eight out of a total of 46 studies reviewed here use baseline and follow-up data and control for self-selection effects. Five of these studies are based on data from China (Yip et al., 2008; Zhang & Wang, 2008; Wagstaff et al., 2009; Chen and Yan, 2012; Xuemei and Xiao, 2011). While Lu et al. (2012) examine the effect of Rwanda's CBHI scheme, Levine et al. (2012) provide an assessment of a scheme in Cambodia and Parmar et al. (2012) examine a scheme in Burkina Faso.

2.6 Conclusions

A number of community-based health insurance schemes are operating in several low and middle-income countries. Such schemes may be thought of as a hybrid between traditional risk sharing and market based insurance arrangements. Matching the increased attention paid to such health financing arrangements as a policy option, empirical studies assessing the effects of such schemes have also proliferated.

The aim of this paper was to inform policy and research by providing a systematic review of the existing empirical evidence on the operation and effectiveness of such schemes with a focus on three outcomes – access to schemes, effect on health care utilization and effect on financial protection. In addition to summarizing the evidence, the paper analysed the link between key scheme design characteristics and their effect on outcomes and finally commented on the quality of the empirical work. Our examination of the evidence yields a number of conclusions pertinent to both health policy makers and to researchers

Despite their avowed aim of social inclusion, the review shows that the ultra-poor do not have access to CBHI schemes. Even if they do enrol, the lowest income groups are less likely to use health care services perhaps due to their inability to bear other costs (transportation and opportunity) associated with accessing health care. There is also considerable evidence that individuals with pre-existing health conditions are more likely to enrol, which leads to concerns about the sustainability of such schemes. The bulk of the studies find that access to CBHI is associated with increased health care utilization, especially with regard to the use of relatively cheaper outpatient care services (4 to 10 percentage point increase) as opposed to inpatient care. The schemes also appear to be associated, in about half the schemes, with a reduction in OOP expenditure (12 to 35 percent). In short, there is evidence to back the claim that such schemes are responsible for enhancing access to health care services and providing a degree of financial protection. The more pertinent question is perhaps not whether such schemes work or not but whether there are specific scheme traits that are more conducive to generating desired outcomes.

A relatively novel aspect of this review has been an assessment of the link between scheme design characteristics and effectiveness. We found that top-down government-run schemes appear to be better in terms of

ensuring health care access and reducing OOP expenditure as compared to community-run schemes. However, community-runs schemes seem to be stronger in terms of reaching out to marginalized groups. Schemes that have access to external sources of financing, in addition to premiums, are more effective in providing financial protection and expanding access to healthcare services but not at reaching out to the ultra-poor. This pattern suggests that subsidies are more likely to flow to the relatively better-off. A clear pattern, regardless of scheme type is that schemes where the community plays a role in scheme design and implementation are better at ensuring access to health care and financial protection – in turn, rather ironically, suggesting a greater need to bring in the community into scheme design and implementation.

Notwithstanding the relatively positive stylized facts emerging from the review, the quality of the underlying research base needs to be carefully considered. While there have been clear methodological improvements in the body of work as compared to Ekman (2004), the burden of proof needed to judge the effectiveness of an intervention has also risen. There are three key concerns. First, the bulk of the papers are based on a single period cross-section data set. While such studies are useful there is a clear need to analyse scheme performance over time. Such dynamic analyses are essential in order to assess the long-term feasibility of a community-based health financing approach. Second, while there is a greater recognition of the need to control for self-selection in scheme uptake and to account for the endogeneity between CBHI uptake and outcomes, the bulk of the papers (37 out of 43) on utilization continue to ignore selection effects, which raises doubts about their internal validity. Third, baseline and (repeated) follow-up data are needed in order to identify causal effects and at the moment a limited set of papers use such data in their assessments of the impact of CBHI schemes.

Notwithstanding the methodological concerns, given the consistency of the findings across the various papers at least with regard to health care utilization and financial protection, the accumulated evidence suggests that CBHI schemes play a limited but important role in ensuring greater access to health care and providing some measure of financial protection to a sub-set of workers in the rural and informal sector in developing countries.

However, from a methodological and more importantly from a policy perspective, future work needs to provide a more careful assessment of

scheme design characteristics which impinge on scheme success and if possible, scheme roll-out and evaluation needs to be integrated so that baseline data and repeated follow-up data are readily available and may be used both to control for unobserved heterogeneity which may be driving scheme uptake and outcomes and to support longer-term analysis of such schemes. Increases in the quality of the evidence base are essential in order to provide a more credible data base on which to judge whether and what type of design features of community-based schemes offer a viable long-term health financing strategy.

Notes

[1] Earlier versions of this paper have appeared as Institute of Social Studies Working Paper No. 568 (2013) and in the proceedings of the fourth Amhara Regional State Economic Development Conference (2013). The paper is co-authored with Robert Sparrow, Getnet Alemu, and Arjun S. Bedi. A shorter version has appeared in the bulletin of the Organization for Social Science Research in Eastern and Southern Africa, *OSSREA Bulletin* XI no. 1 (February 2014): 10-12. The manuscript benefited from useful comments and suggestions from conference participants at the Colloquium for Systematic Reviews in International Development, Dhaka, Bangladesh, December 2012 and the Fourth Amhara Region Economic Development Conference, Bahir Dar, Ethiopia, August 2012.

[2] The World Health Organization defines health expenditure as *catastrophic* if the share of a household's total expenditure on health care services is more than 40 percent of household's capacity to pay. A household's capacity to pay is measured by its total non-food expenditure (for details, see Karami et al., 2009).

[3] The definition of community is often not clear and Dror and Preker (2002, p. 2) treat is as "a generic expression used to cover a large variety of health-financing arrangements". Based on our reading of the literature we define the community in terms of the target population which a particular scheme is trying to reach and community-based in terms of involving the community in some or all aspects of the scheme. The range of arrangements which are placed under the rubric of Community-Based Health Insurance schemes is discussed later on in the review.

[4] While there are no universally accepted definitions of ultra-poor there are several context specific definitions. For instance, Lipton (1983) uses the term to indicate households who are not able to obtain more than 80 percent of their caloric requirements. Similarly, Ahmed et al. (2007) defines the concept in terms of daily income below USD 0.50 (at constant 1993 PPP USD).

[5] Among others, a systematic review is characterised by a study protocol which lays out specific research questions to be addressed, pre-defined inclusion criteria for studies, a systematic search strategy to find and include studies that fulfil the criteria and an assessment of the quality/validity of the findings through an assessment of the methodological features of the literature.

[6] Of the 36 papers reviewed by Ekman (2004), five studies (Carrin et al., 1999; Criel and Kegels, 1997; Jowett et al., 2003; Jutting, 2001; Ranson, 2002) are considered high-quality. The first two are based on descriptive statistics and the remainder use econometric methods. However, all three studies that use regression analysis are based on cross sectional data and only one study (Carrin et al., 1999) uses longitudinal data.

[7] The definition of 'impact' is limited to examining the effect of CBHI schemes on the beneficiaries and does not include the impact on providers in terms of cost recovery and resource mobilization for the health financing system.

[8] For instance, in such a scheme in Kenya's Kilifi district, households reported that they were not interested in renewing their membership since they feel that corruption affects management (Molyneux et al., 2007).

[9] The total number of studies reported here is 48 (i.e, 16 community prepayment health organizations, 7 health care provider initiated insurance schemes, and 25 government run and community involved health insurance schemes). However, Table 2 covers 46 studies. The difference is because the scheme type in one study (Onwujekwe et al. 2009) is not known and each of three studies (Desmet 1999, Diop et al. 2006, Gumber 2001) examines two different types of schemes.

[10] The detailed protocols are described by Green et al. (2008). Ekman (2004) also uses a systematic review approach and adapts the methods proposed by Clark and Oxman (2002), AHRQ (2002), and McKee and Britton (1997).

[11] As discussed in chapter 1, there has been a proliferation of CBHI schemes since 1995 and hence the current review systematically assesses those studies which have been conducted since 1995.

[12] According to the World Bank (2011) classification of economies based on 2010 GNI per capita, the countries covered in our review lie in one of the following categories: low income countries, $1,005 or less (like Afghanistan, Burkina Faso, and Mali); lower middle income countries, $1,006 - $3,975 (like India, Nigeria, and Lao); upper middle income countries, $3,976 - $12,275 (China and Mexico).

[13] All studies that meet the selection criteria are included in the review. In some cases the same scheme has been studied in more than one paper although over different time periods, study outcomes, and the use of different methods.

[14] Utilization includes three types of outcome measures (outpatient care, inpatient care and overall utilization). Some studies examine the impact of the scheme on outpatient and inpatient care separately while some group them together.

[15] Gumber (2001), Ranson (2002), Dror et al. (2009), Ranson et al. (2006), Levine et al. (2012), and Hamid et al. (2011).

3 Self-reported health care seeking behaviour in rural Ethiopia Evidence from clinical vignettes[1]

Abstract

Between 2000 and 2011, Ethiopia rapidly expanded its health-care infrastructure recording an 18-fold increase in the number of health posts and a 7-fold increase in the number of health centres. However, annual per capita outpatient utilization has increased only marginally. The extent to which individuals forego necessary health care, especially why and who foregoes care are issues that have received little attention in the context of low-income countries. This paper uses five clinical vignettes covering a range of context-specific child and adult-related diseases to explore the health-seeking behaviour of rural Ethiopian households. We find almost universal preference for modern care. There is a systematic relationship between socioeconomic status and choice of providers mainly for adult-related conditions with households in higher consumption quintiles more likely to seek care in health centres, private/NGO clinics as opposed to health posts. Similarly, delays in care-seeking behaviour are apparent mainly for adult-related conditions. The differences in care seeking behaviour between adult and child related conditions may be attributed to the recent spread of health posts which have focused on raising awareness of maternal and child health. Overall, the analysis suggests that the lack of health-care utilization is not driven by the inability to recognize health problems or due to a low perceived need for modern care but due to other factors.

3.1 Introduction

Over the past decade, Ethiopia has recorded notable progress in a number of population health outcomes. For instance child mortality per 1000 live births has fallen from 166 in 2000 to 88 in 2011 and maternal mortality rates have declined from 871 to 676 per 100,000 live births (see Table 3.1 for details).

Table 3.1
Selected health indicators

Heath indicator	*Year of the survey*		
	2000	*2005*	*2011*
Under five child mortality rate (per 1,000 live Births)	166	123	88
Under five child diarrhea:			
Prevalence sometime in the two weeks before the survey (in percent)	24	18	13.4
Percentage of these for whom treatment was sought from a health facility	13	22	31.8
Under five child acute respiratory infections (ARI):			
Prevalence at some time in the two weeks before the survey (in percent)	24.4	13.8	7
Percentage of these for whom treatment was sought from a health facility	15.8	21	27
Maternal mortality ratio per 100,000 live births in the last five years	871	673	676
preceding the survey			
Mothers who received at least one antenatal care visit for birth in the last	26.7	28.1	42.4
five years preceding the survey (in percent)			
Deliveries attended by skilled health professionals in the last five years	5.6	5.7	10
preceding the survey (in percent)			

Source: 2000, 2005, and 2011 Ethiopian Demographic and Health Surveys.

These changes have been accompanied by a rapid expansion of health-care infrastructure at all levels. According to Ethiopia's Federal Ministry of Health (see Table 3.2 for details), there has been an 18-fold increase in the number of health posts from 833 in 2000 to 15,095 in 2011 and a 7-fold increase (356 to 2,660) in the number of health centres over the same period. Consequently it is estimated that primary health

care coverage, defined as village-level access to a health post, has increased from 51 percent in 2000 to 92 percent in 2011.

Despite these increases in the supply of health care and increases in the utilization of some specific services, overall outpatient health care utilization rates remain low. For example, according to the Ethiopian Demographic and Health Surveys (see Table 3.1) utilization rates for children suffering from diarrhea have risen from 13 to 32 percent and for acute respiratory infection from 16 to 27 percent between 2000 to 2011, however, outpatient health care utilization per capita per year has increased only marginally from 0.27 visits in 2000 to 0.3 visits in 2011 (Table 3.2). It is unlikely that the limited increase in utilization is due to a decline in morbidity (see Mariam, 2011) and more likely that the gap between availability and utilization is driven by three sets of factors, including, supply-side constraints such as the availability and quality of care, demand-side constraints such as price (direct or indirect - transport costs and the like) or knowledge constraints (so-called suppressed demand) driven by difficulties in understanding disease symptoms and a low perceived need for modern health care. Therefore, the main aim of this paper is to examine the extent of foregone care and to gain an understanding of the factors that are responsible for driving a wedge between availability and utilization.

Table 3.2
Basic health care infrastructure indicators in Ethiopia

Heath indicator	Year		
	2000	*2005/06*	*2011*
Number of health posts	833	5,955	15,095
Number of health centres	356	635	2,660
Number of hospitals (public only)	78	86	122
Number of hospital beds (public, private and NGO)	11,689	13,922	.
Physicians (GP + Specialist) to population ratio*	1:48,829	1:35,493	1:53,642
Nurses to population ratio*	1:9,187	1:4,207	1:2,772
Rural health extension workers to population ratio	.	1:8,434	1:5,426
Primary health care coverage in percent	50.71	76.9	92.1
Outpatient care utilization (visits) per capita per year	0.27	0.33	0.30
Total hospital admissions	95,515	327,075	677,934

Notes: * Only includes health professionals working in public health facilities **Source:** 2000, 2005, and 2011 Ethiopian health and health related indicator statistics obtained from the Ethiopian Federal Ministry of Health (FMoH).

The extent and the reasons for foregoing care and who foregoes care are issues that have often been overlooked in health systems research. Available attempts for developed countries typically rely on explicitly asking survey respondents whether they did not use care when needed (see e.g. Mielck et al., 2009; Schoen et al., 2004). For low and middle income countries the evidence is mainly limited to the use and inequity in use of maternity and child care (e.g. Barros et al., 2012). Moreover these papers focus on assessing the extent of foregone care and do not examine the determinants of foregone care. Self-reported information on foregone care is likely to underestimate unmet health needs, in particular in low-income settings where knowledge about medical conditions and the need for care may be limited. For example, data from the Ethiopian World Health Survey, in which respondents were asked whether they received care the last time it was needed, reveals that only 13 percent of respondents in the poorest quintile reported an unmet need for medical care (WHO, 2005). In contrast, 74.4 percent of women in the poorest quintile, interviewed in the 2011 Ethiopian Demographic Health Survey,

did not receive any antenatal care during their last pregnancy (CSA and ICF International, 2012).

This underestimate may be driven by two problems. First, poorer households may underestimate the need for health care as they may be less aware of their health problems. Highlighting this concern, Bonfrer et al. (2012) use data from several Demographic and Health Surveys conducted in Africa to show larger socioeconomic inequalities in objective measures of ill-health compared to those in subjective (self-reported) outcomes suggesting that poorer households tend to provide more positive assessments of their health status as compared to richer households. Second, even if poor households are aware and value their health in the same way as richer households, they might still report a lower *need for health care* (suppressed demand) due to insufficient knowledge of the benefits of care, distrust of the health care system and financial and/or other supply side restrictions.

One way to investigate the problem of foregone care is by using the concept of clinical vignettes. The idea is to present survey respondents with well-defined medical cases and ask them about treatment needed. By fixing the medical condition, variation in responses to the vignettes may be attributed only to individual differences in perceptions of the care needed and not due to varying severity in the ill health condition. An example would be to present respondents with the symptoms of acute malaria and ask them "if, where and when" a person experiencing such conditions should seek health care. Investigating the responses to such queries will then yield evidence on the perceived need for care and support an investigation of variations in the need for health care across socioeconomic status, and other attributes of interest such as gender, ethnicity, household demographic composition, geographical location and health care supply.

This approach has been adopted by several studies in high-income countries (Adamson et al., 2003; Chaturvedi et al., 2003; Chavez et al., 2010; Frie et al., 2010) and has revealed that in these countries lower socioeconomic (ethnic or education level) groups are *more* likely to consult a doctor for a given set of symptoms. Thus, the studies conclude that inequalities in actual health care utilization may be attributed to barriers in health care provision and differences in case management due to ethnic origins and not due to difficulties in understanding the symptoms of the disease or due to a lower perception of the need for care (Chaturvedi

et al., 2003; Adamson et al., 2003). Despite the potential advantages of using health care vignettes as an alternative technique to analyse health care seeking behaviour, this approach has not been widely used in the context of low and middle-income countries where presumably variations in the perceived need for health care are much greater than in high income countries.[2]

The current study uses a series of context-specific child and adult related clinical vignettes to explore the health care seeking behaviour of rural Ethiopian households. The analysis deals with three issues. First, do households seek modern care, second, conditional on seeking modern care where do they seek care and finally the timing of their care-seeking behaviour. Based on an assessment of these three issues and variations in responses across vignettes and across socioeconomic status we seek to shed light on who foregoes care and why. Specifically, we seek to assess whether limited health care utilization is driven by difficulties in understanding disease symptoms and/or a low perceived need for modern care (suppressed demand) or is it due to other factors such as the availability, quality and price of care.

The remainder of this paper is organized in the following manner. The next section provides a brief contextual description and discusses recent initiatives in the health sector. This is followed by a discussion of the data and methods. Section IV contains estimates while the final section summarizes and concludes the paper.

3.2 The Ethiopian health care system – a brief description

Ethiopia's public health care system consists of three-tiers, that is, health posts, health centres and district and zonal hospitals. Each health post is expected to serve 5,000 individuals. In each of the health posts, there are at least two health extension workers who undergo a one-year training program to provide basic curative and preventive health services.[3] These services, which pay special attention to maternal and child health, include a package of basic preventive and promotive interventions on issues pertaining to disease prevention and control, environmental hygiene and sanitation, and family health which among others, includes advice on family planning, nutrition and the provision of immunization services. Health posts are expected to attend to cases of normal childbirth, provide curative services to handle conditions such as malaria and diarrhea,

and supervise tuberculosis treatment and antiretroviral treatment for HIV/AIDS. While some health posts may have access to antibiotics they are not expected to administer these (see Banteyerga, 2011). In principle, users of health posts do not have to pay for any of the services.

The second level of care is provided by health centres, each of which is supposed to cater to five health posts or 25,000 individuals. Health centres offer both out- and in-patient services (10 beds) as well as basic laboratory and pharmacy services and are expected to be staffed by two health officers, three midwives and five nurses.[4] General hospitals at the district and zonal levels are expected to cater to 250,000 and 1 million individuals, respectively, and offer a wide range of out-patient and in-patient care (a minimum capacity of 50 beds) as well as laboratory, imaging and pharmacy services. Such hospitals are expected to be staffed by a number of general medical practitioners as well as specialized doctors and nurses. In order to use health centre (hospital) services users are expected to pay a fee ranging from ETB 1–5 (3–10) for consultations and to pay for medicines (USAID, 2011).

On the supply-side, in recent years, the government has focused on enhancing access to primary health care through the expansion of health centres and especially through health posts. Since 2003, under the aegis of the community-based Health Services Extension Programme (HSEP) there has been a rapid expansion of health posts across all regions of the country (for details see Admassie et al. 2009; Banteyerga, 2011). HSEP was rolled out in a stepwise fashion and was expected to reach full coverage of 1 health post for every 5,000 individuals by 2009-10. While this target may not have been reached, at least at the national level, the availability of health posts is not too far from this mark with one health post for every 5,426 individuals (see Table 3.3) and primary health care coverage of 92 percent. According to Admassie et al. (2009), HSEP was a "major move from Ethiopia's traditional system of facility-based health care services" as it adopted a preventive and promotive health care approach and required health extension workers to adopt a proactive approach and visit households to provide health education and services rather than waiting for households to come to health posts. To achieve its objectives, health extension workers are expected to spend 75 percent of their time visiting households and to teach by example as well as by identifying and training model families who in turn will diffuse knowledge to other families. The government's HSEP has attracted in-

ternational attention and has been praised as a cost-effective way of providing universal access to health care (Balabanova et al. 2011).

Table 3.3
Regional distribution of health facilities in 2011

Region	*Hospitals*		*Health centre (HC)*		*Health post (HP)*		*Primary health care coverage*
	N	*Hospital-Pop. Ratio*	*N*	*HC-Pop. Ratio*	*N*	*HP-Pop. Ratio*	
Tigray	14	1:340,168	183	1:26,024	552	1:8627	58.0
Amhara	19	1:969,200	724	1:25,435	3,093	1:5954	84.0
Oromia	41	1:742,648	991	1:30,725	6,053	1:5030	99.4
SNNPR	20	1:843,242	513	1:32,875	3,603	1:4681	106.8
National	122	1:671,402	2,660	1:30,794	15,095	1:5426	92.1

Source: Ethiopian health and health related indicator statistics obtained from the Ethiopian Federal Ministry of Health (FMoH).

Despite this impressive expansion, the government's budgetary allocation for health care is well-below the level required to supply adequate health care services. Per capita public health expenditure in 2007-2008 was $2.23, which is considerably lower than the $15.41 per capita required to achieve the health targets of the Millennium Development Goals (MDGs) and the $34 advised by the WHO to provide basic healthcare services in low income countries (Fekade, 2010). In 2009, private health care spending as a percentage of total expenditure on health constituted 52.4 percent. About 80 percent of private health expenditure was in the form of out-of-pocket payment and only 1.5 percent of private healthcare expenditure was covered by private insurance institutions, which is low as compared to other Sub-Saharan African Countries such as Kenya (8.8%), Benin (7.3%) and Senegal (17.9%) (WHO, 2012).

To tackle some of these issues, and as a complement to the heavy investment in the supply of health care, since 2008 the government has been pursuing a number of reforms related to the financing of health care. Most prominently, in order to increase discretionary resources and to help improve quality, the government has been supporting a policy of

revenue retention and utilization at the facility level. By December 2011, 79 percent of health centres and 88 percent of hospitals had implemented the reform and funds raised by these facilities are being ploughed back into the facility. While there are differences across facilities, typically, the first priority is the use of funds to procure drugs. A recent evaluation of the reform provided a positive assessment and noted that "by and large, facilities adhere to the guidelines for retained revenue utilization" (see USAID, 2011).

The revenue retention programme was accompanied by two components (i) setting and revision of user fees and prices charged for drugs and (ii) a cost waiver system for the "poorest of the poor". It appears that these components have not been as successfully implemented. While drug prices are regularly revised, for various reasons, in several regions, a comprehensive revision of user fees, recommended every five years, has not taken place. At the same time the fee waiver system has been patchily implemented. The scheme has been relatively comprehensively implemented in the Amhara region, followed by Oromiya, while in SNNPR only 27 of 157 districts have started implementing the system (USAID, 2011).

The most recent attempt to raise additional resources for health care and to enhance access has been the introduction of a government supported community-based health insurance (CBHI) scheme for the rural population and urban informal sector workers. Since mid-2011, on a pilot basis, a voluntary CBHI scheme has been established in four main regional states (Amhara, Tigray, Oromiya and SNNPR). In each region the intervention encompasses three selected districts. Each enrolled household is expected to pay a one-time registration fee of ETB 5 and an annual fee of ETB 180. As of December 2011, 37,766 paying households had been enrolled. Plans to scale-up and offer the CBHI scheme at a national level are currently under discussion.

3.3 Data description

This study is based on a household survey which covers the four main regions of the country (*Tigray, Amhara, Oromiya*, and *SNNPR*). From each of these regions, which together account for about 86 percent of the country's population (Population Census Commission, 2008) four districts were selected and within each district a household survey was

canvassed in 6 randomly chosen kebeles (peasant associations).[5] In each of the 96 kebeles, 17 households were randomly surveyed yielding a total of 1,632 households comprising 9,455 individuals. The survey was canvassed between March and April 2011(before the roll out of the CBHI scheme) and contains extensive information on a variety of individual and household socio-economic attributes including information on health status, health care utilization and health care seeking behaviour. In addition to the household survey, in August 2011, facility surveys designed to assess the availability of medicines and equipment were conducted in 32 health posts (8 in each region) and 48 (12 in each region) health centres.[6]

The household survey instrument contains five short clinical vignettes which were developed with input from researchers at Addis Ababa University's School of Public Health[7]. The vignettes are based on illnesses that are widely prevalent in the study region and may be related to acute respiratory infection/pneumonia among babies, diarrhea affecting female infants, adult male experiencing malaria, adult male experiencing tetanus, and an adult female affected by tuberculosis.[8] The vignettes were primarily designed to enable an exploration of heterogeneity in health care seeking behaviour for conditions affecting children and adults. For each case respondents were asked what they would do, that is, whether and where they would seek care and when they would seek care in case they or someone in their household were to experience the symptoms described in the vignettes.[9] Respondents were offered a set of 11 choices for health care provider including an option for foregone care (do nothing). Based on the government's service guidelines, diagnosis and treatment for diarrhea and malaria is expected to be available at health posts.[10] Health centres and hospitals are expected to be able to cater to all the illnesses described in the vignettes.[11]

Conditional on their response, respondents were asked when they would seek care and were offered a set of 6 options ranging from immediate to more than a week later. The vignettes were designed with the view that medically the immediate care-seeking option may be considered the appropriate course of action (for details see Appendix A1). The vignettes were read out to respondents by trained enumerators and responses provided by household heads were recorded. Response rates, for where to seek care and when to seek care are high, 99.7 and 97.4 percent respectively.

In addition to the vignettes, information on a range of other variables was collected in order to enable an exploration of the associations between health care seeking behaviour and other attributes of interest. These include information on household demographic composition, education of the household head, household health status, economic status as captured by per capita household consumption, attitudes towards modern health care, a range of variables to control for access to public (health) infrastructure and finally a set of indicators to control for regional differences. Descriptive statistics for the sample as a whole as well as region-specific descriptive statistics are provided in Table 3.4.

Table 3.4
Means of covariates

Characteristics	*Region*				*Total sample*	*N*
	Tigray	*Amhara*	*Oromiya*	*SNNPR*		
Male headed households (1/0)	0.72	0.91	0.91	0.90	0.86	1,632
Age of the household heads (years)	48.01	47.64	44.01	45.25	46.23	1,631
Head's education (1/0)						
No education at all	0.59	0.43	0.46	0.38	0.47	1,631
Informal education	0.08	0.26	0.14	0.03	0.13	1,631
Primary	0.31	0.29	0.36	0.49	0.36	1,631
Secondary or postsecondary	0.01	0.02	0.04	0.10	0.04	1,631
Religion of the head (1/0)						
Orthodox Christian	0.99	0.50	0.49	0.10	0.52	1,632
Protestant	0.00	0.00	0.02	0.76	0.19	1,632
Muslim	0.01	0.50	0.49	0.05	0.26	1,632
Other religion or no religion	0.00	0.00	0.00	0.10	0.03	1,632
HH size (number of persons)	5.17	5.69	5.91	6.40	5.79	1,632
Household composition						
Proportion of children aged under 6	0.15	0.13	0.17	0.14	0.15	1,632
Proportion of males aged 6 to 15	0.15	0.15	0.18	0.16	0.16	1,632

Proportion of females aged 6 to 15	0.14	0.15	0.14	0.16	0.15	1,632
Proportion of males aged 16 to 64	0.22	0.26	0.24	0.26	0.25	1,632
Proportion of females aged 16 to 64	0.26	0.26	0.24	0.25	0.25	1,632
Proportion of elderly aged above 64	0.08	0.05	0.03	0.03	0.05	1,632
Self-assessed health status (SAH)						
Proportion of household members with good SAH	0.70	0.74	0.93	0.79	0.79	1,632
Proportion of household members with fair SAH	0.24	0.22	0.05	0.15	0.17	1,632
Proportion of household members with low SAH	0.05	0.04	0.01	0.06	0.04	1,632
Consumption quintiles (1/0)						
Poorest quintile	0.22	0.15	0.06	0.37	0.20	1,593
2nd quintile	0.26	0.21	0.11	0.22	0.20	1,593
3rd quintile	0.22	0.22	0.21	0.15	0.20	1,593
4th quintile	0.14	0.24	0.29	0.12	0.20	1,593
Richest quintile	0.16	0.17	0.33	0.14	0.20	1,593
Modern care can be trusted (1/0)						
Disagree	0.14	0.05	0.06	0.08	0.08	1,627
Neither agree nor disagree	0.07	0.03	0.09	0.06	0.06	1,627
Agree	0.80	0.92	0.85	0.86	0.85	1,627
Access to public infrastructure						
Water using from public sources (1/0)	0.77	0.57	0.34	0.67	0.59	1,631
Use electricity (1/0)	0.06	0.15	0.02	0.06	0.07	1,626
No mobile signal (1/0)	0.92	0.73	0.74	0.78	0.79	1,632
Travel time to the nearest health post	34.54	31.2	24.65	21.36	27.81	1,599

(in minutes)						
Travel time to the nearest health centre (in minutes)	74.38	65.65	63.92	54.68	64.66	1,632
Travel time to the nearest public hospital (in minutes)	140.87	116.83	96.31	88.68	110.65	1,631

3.4 Empirical framework

The analysis begins by examining responses to the two parts of each vignette, that is, where to seek care and when to seek care. This is followed by an examination of a binary outcome - the probability of seeking (modern) care versus the alternative of other care options.[12] Odds ratios based on logit regressions of the binary outcome as a function of a number of household and village characteristics are provided for each vignette. We also estimate a series of multinomial logit (MNL) models for the type of provider sought in response to each vignette. To enhance the tractability of the empirical work, the 11 options are classified into five options which include seeking care from health posts, health centres, private/NGO clinics, public/private/NGO hospitals and other options. While we follow this five-part classification for all the vignettes an exception is the tuberculosis-related vignette where due to the unlikelihood of getting treatment from a health post for the described symptoms, we re-estimate a MNL model where seeking care from a health post is classified as part of other care options. Conditional on choosing modern care we examine the timing of care-seeking behaviour using a set of ordered logit models. The outcome variable consists of five options – seek care immediately, the next day, after two days, between three days to one week, a week or more.

3.5 Results

3.5.1 Whether to seek care

Table 3.5 provides vignette-specific information on the reported choices. The table reveals a potentially striking pattern – a very small proportion of respondents would forego treatment all together (do nothing) with fore-

gone care ranging from 0.6 percent for diarrhea to 2.5 percent for tetanus. Similarly, across all vignettes there is a strong preference for modern care. Only in a small fraction of cases ranging from 2.3 percent for diarrhea and about 4.7 percent for tetanus do households report that they would resort to other options. Given the country's low socio-economic development and low educational stock (see Table 3.4) this is surprising. A potential explanation may lie in the rapid and recent spread of health posts and health extension workers who since 2003 have been charged with the responsibility of raising awareness of health issues. This interpretation is buttressed by the descriptive statistics provided in Table 3.4 which show that across the board 85 percent of the sample respondents agree with the statement that modern sources of health care can be trusted.

Nevertheless, surprised by these high rates of modern care uptake in response to hypothetical symptoms we also examined actual outpatient health care seeking behaviour. While these two - actual health care seeking behaviour without any controls for the particular disease affecting individuals and hypothetical care seeking behaviour in response to a

Table 3.5
Responses to the vignettes

	Case vignette[a]				
	ARI/Pneumonia	*Diarrhea*	*Malaria*	*Tetanus*	*Tuberculosis*
Where to seek care					
Health post	41.17	33.56	21.72	24.80	20.02
Health centre	50.00	56.63	62.02	59.05	60.57
Private clinic	4.05	5.64	6.63	6.63	5.96
Mission/NGO clinic	0.25	0.18	0.31	0.18	0.37
Public hospital	1.41	1.47	4.48	4.42	9.95
Private hospital	0.12	0.18	0.18	0.12	0.31
Mission/NGO hospital	0.06	0.06	0.18	0.06	0.00
Pharmacy/drug store	0.25	0.37	0.25	0.37	0.00
Religious healer	0.74	0.31	1.10	0.12	1.11
Traditional healer	0.80	1.04	1.84	1.78	0.68
Do nothing	1.17	0.55	1.47	2.46	1.04
N	1,630	1,630	1,630	1,629	1,628

When to seek care[b]					
Immediately	54.24	45.76	27.67	34.86	21.05
The next day	37.04	39.11	31.47	25.97	25.35
After two days	6.95	11.61	22.72	17.27	17.64
Between three and a week	1.33	2.64	12.42	11.86	12.77
After a week or more than a week	0.44	0.88	5.73	10.05	23.20
N	1,582	1,593	1,554	1,552	1,582

Notes: [a] All figures in the table are in percent. [b] Only for respondents who use modern care (that is, health post, health centres, private clinics, mission/NGO clinics, public hospitals, private hospital, and Mission/NGO hospitals).

description of disease-related symptoms may not be comparable, given the high rate of modern care uptake we felt it was important to examine actual utilization in order to get a sense of the credibility of the vignette instrument. Figures for actual health seeking behaviour provided in Table 3.6 show that foregone care is close to 30 percent as compared to about 1-3 percent on the basis of the vignettes.[13] This difference may be related to the relatively serious ill health conditions described in the vignettes. Infact the actual utilization figures for use of modern care among those individuals who have had illness symptoms are similar to those described in the vignettes is very high. For instance, the share of individuals who used modern care services is 90 percent for diarrhea, 86 percent for cough, 100 percent for fever, and 94 percent for malaria. Similarly, conditional on facing an illness/injury close to 90 percent of respondents report that they use modern care as opposed to other care options. This figure is quite similar to that obtained from the vignettes suggesting that the overwhelming reliance on modern care as revealed by the vignettes is unlikely to be driven by a lack of understanding of the vignette instrument.[14]

Table 3.6
Outpatient care utilization

	N (%)
Household members reporting illness / injury in the two months preceding the survey (percent of sample)	1,161 (13.53)
Obtained health care conditional on illness / Injury (percent of those reporting illness/injury)	805 (69.58)
Source of care (percent who report conditional on illness / injury)	
Health post	57 (7.42)
Health centre	389 (50.65)
Private clinic	142 (18.49)
Mission/NGO clinic	6 (0.78)
Public hospital	69 (8.98)
Private hospital	12 (1.56)
Mission/NGO hospital	7 (0.91)
Pharmacy/drug store	31 (4.04)
Religious healer	4 (0.52)
Traditional healer	23 (2.99)
At home	19 (2.47)
Neighbour's home	2 (0.26)
Other	7 (0.91)

To explore patterns in health care seeking behaviour across various characteristics we provide estimates of the probability of using modern versus alternative care based on a set of logit models. Table 3.7 presents estimates for each of the vignettes. Across all socio-economic categories, as captured by the education of the household head and consumption quintiles, health care seeking behaviour for the two most common sources of child morbidity and mortality (ARI/pneumonia and diarrhea – columns 1 and 2) do not differ systematically. While there is some variation, in general, children in households with uneducated heads are just as likely to access modern care as those with primary education. Similarly, children in households in the lowest consumption quintiles are just as likely to access modern care as those living in households in the highest quintiles (4^{th} and 5^{th}).

Table 3.7
Probability of seeking modern care - Odds ratios based on logit specifications

Variables	*ARI / Pneumonia* *(1)*	*Diarrhea* *(2)*	*Malaria* *(3)*	*Tetanus* *(4)*	*Tuberculosis* *(5)*
Head sex	1.818	2.078	1.139	1.055	1.288
Head age	0.999	0.976	1.017	0.981	0.982**
Head's education (ref: no education at all)					
Informal education	0.741	0.277**	0.378***	1.274	1.018
Primary	0.883	0.782	1.811*	1.347	0.590***
Secondary or post-secondary	3.598	.	.	1.780	0.488**
Household size	1.031	1.100	0.897	1.235**	1.032
HH composition (ref: Prop. of male adults aged 16 to 64)					
Prop. of children aged under 6	0.0889	0.0359*	0.290	0.0368***	0.549
Prop. of males aged 6 to 15	0.899	0.262	0.483	0.152*	1.411
Prop. of females aged 6 to 15	0.0330**	1.078	0.946	0.442	1.071
Prop. of females aged 16 to 64	1.300	0.903	0.111*	1.640	0.477
Prop. of elderly aged above 64	0.121	0.132	0.0265***	0.575	0.731
HH health status (ref: Prop. of households with good SAH)					
Prop. of household with fair SAH	2.202	1.916	1.522	1.825	1.116
Prop. of household with low SAH	8.311	6.341	.	7.200	0.566
Consumption quintiles (ref: poorest quintile)					
2nd quintile	2.904*	3.147*	2.198**	1.543	2.310***
3rd quintile	1.575	1.406	1.846	0.997	2.295***
4th quintile	0.784	1.053	3.258**	1.253	3.816***
Richest quintile	0.771	3.117	2.156*	1.004	2.583***

Trust in modern heath care (ref: disagree)					
Agree	1.292	2.181	3.642***	2.588**	0.441***
Neither agree nor disagree	0.606	0.628	0.607	0.366**	0.194***
Access to public infrastructure					
Water using from public sources	0.960	0.952	1.379	1.080	0.970
Use electricity	4.023	2.083	0.835	1.218	2.628***
No TV signal	1.256	2.851**	1.130	0.842	0.655**
No mobile signal	1.090	0.931	1.265	1.288	1.021
Travel time to the nearest health	1.003	0.990	1.017**	1.009	1.006
post (in minutes)					
Travel time to the nearest health	1.003	1.009	0.995	0.996	0.993***
centre (in minutes)					
Travel time to the nearest public	0.994**	0.992**	0.995**	0.997	1.002*
hospital (in minutes)					
Religion of the head (ref: Muslim)					
Orthodox Christian	2.498*	0.715	3.603***	1.740	3.517***
Protestant	1.050	0.763	0.636	0.376	4.150***
Other religion or no religion	0.626	0.149*	0.394	0.149*	6.392***
Regions (ref: SNNPR)					
Tigray	3.134	7.000*	0.999	1.239	1.169
Amhara	3.698	7.321**	1.112	0.898	9.946***
Oromiya	2.712	6.226*	1.740	1.876	17.75***
Pseudo R^2	0.154	0.224	0.192	0.165	0.205
N	1,546	1,480	1,480	1,545	1,545

Notes: *** p<0.01, ** p<0.05, * p<0.1. Except for the estimates in the last column, the modern health care option includes health posts, health centres, private clinics, mission/NGO clinics, public hospitals, private hospital, and mission/NGO hospitals and other care option includes do nothing, traditional healers, religious healers, and pharmacies/drug stores. In the case of tuberculosis, health posts are included as part of the other care option. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell. For example, very few individuals with secondary education or a small proportion of households with low SAH status.

Differences are more pronounced for vignettes related to adults. The effects of education are mixed. In the case of malaria, households headed by more educated individuals are more likely to seek modern care, there is no effect of education in the case of the tetanus vignette and with regard to tuberculosis more educated individuals are more likely to seek the other care option. The effects of economic status are far clearer. In the case of malaria, households in the richer quintiles are 2.1 to 3.3 times more likely to seek modern care as compared to those in the poorest quintile and for tuberculosis households in the richer quintiles are 2.3 to 3.8 times more likely to avoid the other care option.

With regard to the other covariates, except for tuberculosis, the gender and age of the household head does not have a bearing on the health-seeking behaviour. Similarly, household size, demographic composition and health status play a limited role. However, the religion of the household head plays a role. In three of the five cases (ARI/pneumonia, malaria and tuberculosis) households headed by orthodox Christians are 2.5 to 3.6 times more likely to seek modern care as compared to Muslim headed households. The regional patterns indicate that for diarrhea and tuberculosis, households in Amhara and Oromiya are far more likely to use modern care as compared to their counterparts in SNNPR. Since access to public health facilities in SNNPR seems to be at least at par or at times better as compared to other regions (see Tables 3.3 and 3.4), as discussed above, it is likely that the lower probability of using care in SNNPR may be due to the limited implementation of the fee waiver system in this region as compared to Amhara and Oromiya regions. In addition, based on the facility survey we find that health posts in Amhara region are relatively better resourced as compared to all other regions (see footnote 9).

3.5.2 Where to seek care

Tables 3.8a to 3.8e provide multinomial logit estimates of health-seeking behaviour for each of the vignettes. As in the case for the decision to seek modern care, characteristics such as the sex and age of the household head, household size, demographic composition and self-assessed health status do not appear to be systematically related to health-seeking behaviour. Accordingly for each vignette we focus mainly on the effects

of education and religion of the household heads, consumption and geographical location.

Table 3.8a
Probability of seeking care for ARI/pneumonia- Relative risk ratios, based on multinomial logit specifications

Variables	*Health centre*	*Private / NGO clinic*	*Public / Private / NGO hospital*	*Other care options*
Head sex	1.010	2.237	2.242	0.753
Head age	0.991	1.002	0.995	1.009
Head's education (ref: no education at all)				
Informal education	1.611**	0.927	0.268	0.779
Primary	1.170	0.523*	0.589	0.564
Secondary or post-secondary	1.763*	0.670	1.144	.
Household size	1.066	1.014	1.080	0.962
HH composition (ref: Prop. of male adults aged 16 to 64)				
Prop. of children aged under 6	0.233***	0.294	1.369	20.07
Prop. of males aged 6 to 15	0.740	4.385	3.505	7.392
Prop. of females aged 6 to 15	0.901	2.402	2.369	42.50*
Prop. of females aged 16 to 64	0.539	1.319	0.433	4.519
Prop. of elderly aged above 64	0.996	0.114	0.004	21.21
HH health status (ref: Prop. of households with good SAH)				
Prop. of household with fair SAH	0.752	0.541	0.110	0.499
Prop. of household with low SAH	0.350**	0.151	.	0.0151
Consumption quintiles (ref: poorest quintile)				
2nd quintile	1.443*	1.997	.	0.422
3rd quintile	1.372	1.807	.	0.858
4th quintile	1.442*	1.588	.	1.730
Richest quintile	1.413	3.057**	.	1.188
Trust in modern heath care (ref: disagree)				
Agree	0.626**	0.761	0.251	0.404
Neither agree nor disagree	0.372***	0.842	.	0.984
Access to public infrastructure				
Water using from public	1.392**	0.775	0.276**	0.946

sources				
Use electricity	4.531***	3.240*	20.34***	0
No TV signal	0.848	0.689	0.777	0.393*
No mobile signal	1.852***	0.652	4.684*	0.787
Travel time to the nearest health post (in minutes)	1.014***	0.997	1.015	1.011
Travel time to the nearest health centre (in minutes)	0.990***	1.003	1.004	0.994
Travel time to the nearest public hospital (in minutes)	1.001	0.995*	0.989**	1.010***
Religion of the head (ref: Muslim)				
Orthodox Christian	3.448***	4.334***	12.08***	1.894
Protestant	3.597***	1.121	2.408	1.600
Other religion or no religion	6.223***	6.012**	5.486	1.602
Regions(ref: SNNPR)				
Tigray	0.697	0.0297***	0.116*	0.0701**
Amhara	11.04***	1.106	0.936	0.666
Oromiya	4.365***	0.541	0.426	0.116*
Pseudo R^2			0.193	
N			1,527	

Notes: *** p<0.01, ** p<0.05, * p<0.1. The reference outcome is health posts. Other care options include do nothing, traditional healers, religious healers, and pharmacies/drug stores. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell. For example, very few individuals with secondary education opting for the no-care option or very few households with low SAH status seeking care in hospitals

The estimates of the ARI/pneumonia vignette (Table 3.8a) show that household heads with informal education or higher than secondary education are 1.6 to 1.8 times more likely to take their children to health centres (baseline is health posts) which potentially offer higher quality of care as compared to household heads with no education. Educational status is not systematically related to other sources of health care, and even household heads with no education are unlikely to rely on other care options. Similarly with regard to diarrhea (Table 3.8b), educational status does not exert much of an influence on care-seeking behaviour.

Table 3.8b
Probability of seeking care for diarrhea- Relative risk ratios based on multinomial logit specifications

Variables	*Health centre*	*Private / NGO clinic*	*Public / Private / NGO hospital*	*Other care options*
Head sex	0.941	0.964	7.846*	0.959
Head age	0.987*	0.997	0.965	1.018
Head's education (ref: no education at all)				
Informal education	1.302	0.542	0.163	4.330*
Primary	0.832	0.589*	0.445	1.041
Secondary or post-secondary	0.981	0.755	0.705	.
Household size	1.067	1.160*	1.029	0.954
HH composition (ref: Prop. of male adults aged 16 to 64)				
Prop. of children aged under 6	0.265**	0.125*	0.158	6.510
Prop. of males aged 6 to 15	0.801	1.231	0.805	4.784
Prop. of females aged 6 to 15	0.495	0.289	3.139	0.123
Prop. of females aged 16 to 64	0.752	0.571	3.012	3.315
Prop. of elderly aged above 64	0.933	0.0550	0.749	31.33
HH health status (ref: Prop. of households with good SAH)				
Prop. of household with fair SAH	0.818	0.698	0.290	0.516
Prop. of household with low SAH	0.372**	0.0361*	0.143	0.0287
Consumption quintiles (ref: poorest quintile)				
2nd quintile	1.463*	2.077*	7.170*	0.373
3rd quintile	1.656**	1.720	8.574*	1.086
4th quintile	1.423*	1.925	18.82***	2.417
Richest quintile	1.469*	2.178*	11.09**	0.596
Trust in modern heath care (ref: disagree)				
Agree	0.674*	0.995	0.226**	0.216**
Neither agree nor disagree	0.349***	0.991	.	0.902
Access to public infrastructure				
Water using from public sources	1.125	0.816	0.209***	1.509
Use electricity	3.833***	3.085*	39.84***	.
No TV signal	0.719**	0.741	1.641	0.289**
No mobile signal	0.932	0.249***	0.943	0.924
Travel time to the nearest	1.016***	1.000	1.005	1.031**

health post (in minutes)				
Travel time to the nearest health centre (in minutes)	0.992***	1.004	1.008	0.977***
Travel time to the nearest public hospital (in minutes)	1.000	0.989***	0.995	1.014***
Religion of the head (ref: Muslim)				
Orthodox Christian	3.956***	4.112***	7.517***	5.486
Protestant	5.425***	1.252	2.380	6.923
Other religion or no religion	10.73***	4.212*	6.345	.
Regions(ref: SNNPR)				
Tigray	0.871	0.0184***	0.132*	0.0467**
Amhara	10.45***	2.010	1.572	0.715
Oromiya	7.798***	2.274	0.763	.
Pseudo R^2			0.196	
N			1,537	

Notes: *** p<0.01, ** p<0.05, * p<0.1. The reference outcome is health posts. Other care options include do nothing, traditional healers, religious healers, and pharmacies/drug stores. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell, for example, very few individuals with secondary education opting for the no-care option.

However, in both cases, there is clearer evidence that households in higher consumption quintiles are more likely to access health centres and hospitals as opposed to health posts. The limited role played by education and the more important role played by the household's economic status suggests that differences in health-seeking behaviour for child-related conditions may be driven less by household inability to recognize the severity of symptoms but more by lack of resources which may push them to seek lower level care.

Table 3.8c
Probability of seeking care for malaria – Relative risk ratios based on multinomial logit specifications

Variables	*Health centre*	*Private / NGO clinic*	*Public / Private / NGO hospital*	*Other care options*
Head sex	1.091	1.287	1.929	1.058
Head age	0.988	0.998	0.988	0.956**
Head's education (ref: no education at all)				
Informal education	1.596	1.052	1.589	6.585***
Primary	0.665**	0.476**	0.986	0.288**
Secondary or post-secondary	0.523*	0.333*	0.643	.
Household size	1.062	1.155*	1.069	1.295**
HH composition (ref: Prop. of male adults aged 16 to 64)				
Prop. of children aged under 6	0.590	0.408	0.427	0.402
Prop. of males aged 6 to 15	1.327	2.966	2.085	3.277
Prop. of females aged 6 to 15	1.034	1.572	1.207	1.773
Prop. of females aged 16 to 64	0.847	0.302	0.648	14.45
Prop. of elderly aged above 64	0.708	0.464	3.344	285.3***
HH health status (ref: Prop. of households with good SAH)				
Prop. of household with fair SAH	0.980	1.229	0.487	0.253*
Prop. of household with low SAH	0.557	0.0553*	0.408	0.000648**
Consumption quintiles (ref: poorest quintile)				
2nd quintile	1.968***	3.870***	3.294**	0.828
3rd quintile	2.269***	3.575***	4.878***	0.858
4th quintile	2.748***	4.399***	8.796***	0.959
Richest quintile	2.053***	5.536***	5.246***	1.162
Trust in modern heath care (ref: disagree)				
Agree	0.376***	0.931	0.526	0.0696***
Neither agree nor disagree	0.195***	0.417	0.255	0.169***
Access to public infrastructure				
Water using from public sources	1.079	0.739	0.468**	0.561
Use electricity	3.816***	1.942	6.236***	4.277*
No TV signal	0.436***	0.453**	2.139*	0.368**
No mobile signal	1.348	0.504**	0.453**	1.258

Travel time to the nearest health post (in minutes)	1.012***	0.996	1.002	0.994
Travel time to the nearest health centre (in minutes)	0.991***	1.003	0.999	1.001
Travel time to the nearest public hospital (in minutes)	1.002**	0.992***	1.003	1.008**
Religion of the head (ref: Muslim)				
Orthodox Christian	3.693***	2.789***	0.931	0.627
Protestant	7.578***	1.461	0.397	11.20**
Other religion or no religion	14.61***	11.24***	1.213	41.53***
Regions (ref: SNNPR)				
Tigray	1.799	0.118***	0.460	0.640
Amhara	12.56***	3.099**	2.782	5.814
Oromiya	28.05***	8.934***	3.617*	1.532
Pseudo R^2			0.204	
N			1,523	

Notes: *** p<0.01, ** p<0.05, * p<0.1. The reference outcome is health posts. Other care options include do nothing, traditional healers, religious healers, and pharmacies/drug stores. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell, for example, very few individuals with secondary education opting for the no-care option.

With regard to the three vignettes for adults – malaria (Table 3.8c), tetanus (Table 3.8d) and tuberculosis (Table 3.8e) – household consumption appears to play an important role in influencing choice of health care provider. Households in the bottom quintile are far more likely to visit health posts while all other consumption quintiles are more likely to access higher level care. For the malaria vignette, the probability of using care from health centres is 2 times higher and from private or public hospitals is 3 to 9 times more likely for higher consumption quintiles as compared to the poorest quintile. At the same time there is no evidence that households in the lower-most quintile are being pushed to other care options, except for tuberculosis (Table 3.8e).

Table 3.8d
Probability of seeking care for tetanus - Relative risk ratios based on multinomial logit specifications

Variables	*Health centre*	*Private / NGO clinic*	*Public / Private / NGO hospital*	*Other care options*
Head sex	0.827	1.680	2.203	1.150
Head age	0.990	0.996	1.002	0.987
Head's education (ref: no education at all)				
Informal education	1.145	0.393**	0.572	0.421
Primary	0.763	0.403***	0.736	0.308**
Secondary or post-secondary	0.875	0.209**	0.187	0.539
Household size	1.077*	1.062	1.050	1.051
HH composition (ref: Prop. of male adults aged 16 to 64)				
Prop. of children aged under 6	1.024	1.272	2.063	86.92**
Prop. of males aged 6 to 15	1.928	2.527	2.313	97.80**
Prop. of females aged 6 to 15	0.841	1.195	0.451	4.433
Prop. of females aged 16 to 64	1.069	0.167	1.254	10.78
Prop. of elderly aged above 64	1.304	0.211	2.109	94.98**
HH health status (ref: Prop. of households with good SAH)				
Prop. of household with fair SAH	0.853	1.277	1.036	0.270
Prop. of household with low SAH	0.415*	0.0474*	0.192	0.0242
Consumption quintiles (ref: poorest quintile)				
2nd quintile	1.770***	2.954***	7.405**	1.438
3rd quintile	1.626**	2.515**	11.87***	1.597
4th quintile	2.814***	3.036**	29.04***	3.754**
Richest quintile	1.862**	3.248**	9.416***	4.926**
Trust in modern heath care (ref: disagree)				
Agree	0.377***	2.696	0.952	0.0859***
Neither agree nor disagree	0.291***	0.907	0.435	0.443
Access to public infrastructure				

Water using from public sources	1.025	0.701	0.346***	0.970
Use electricity	2.376***	2.606*	3.880**	0.951
No TV signal	0.548***	0.521**	2.185**	0.615
No mobile signal	1.205	0.405***	0.407**	0.629
Travel time to the nearest health post (in minutes)	1.017***	1.006	1.004	1.003
Travel time to the nearest health centre (in minutes)	0.989***	1.003	1.001	1.003
Travel time to the nearest public hospital (in minutes)	1.002**	0.988***	0.998	1.002
Religion of the head (ref: Muslim)				
Orthodox Christian	3.748***	2.362**	0.781	0.314
Protestant	5.123***	1.104	0.281	.
Other religion or no religion	9.581***	4.651*	0.936	.
Regions (ref: SNNPR)				
Tigray	1.498	0.0804***	0.570	.
Amhara	8.687***	2.218	1.333	.
Oromiya	23.97***	9.438***	3.782*	.
Pseudo R^2			0.210	
N			1,507	

Notes: *** p<0.01, ** p<0.05, * p<0.1. The reference outcome is health posts. Other care options include do nothing, traditional healers, religious healers, and pharmacies/drug stores. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell, for example, very few Protestant head of households opting for the no-care option.

The estimates reveal systematic differences in the choice of health care providers across different religions. For both child and adult vignettes, Orthodox Christians and Protestants are more likely to choose higher level care (health centres and private clinics) as compared to Muslims. For instance, in the case of ARI/pneumonia (Table 3.8e), Christians are about 3.5 times more likely to use health centres and in the case of diarrhea about 4-5 times more likely to use health centres. In the case of tuberculosis, the pattern is similar in the sense that Christians are

more likely to seek care in health centres and less likely to use other care options (which includes health posts in this case).[15] Across all vignettes, households living in the Amhara and Oromiya regions are far more likely to seek care from health centres as compared to the SNNPR regions.

Table 3.8e
Probability of seeking care for tuberculosis - Relative risk ratios based on multinomial logit specifications

Variables	*Private / NGO clinic*	*Public / Private NGO hospital*	*Other care options*
Head sex	2.385	1.510	0.832
Head age	1.008	0.999	1.018**
Head's education (ref: no education at all)			
Informal education	0.549	1.232	0.962
Primary	0.743	0.908	1.639***
Secondary or post-secondary	0.407	0.760	1.828
Household size	0.959	1.001	0.969
HH composition (ref: Prop. of male adults aged 16 to 64)			
Prop. of children aged under 6	0.269	3.349	1.842
Prop. of males aged 6 to 15	1.389	2.129	0.772
Prop. of females aged 6 to 15	0.821	1.979	0.960
Prop. of females aged 16 to 64	0.219	2.972	2.156
Prop. of elderly aged above 64	0.155	4.116	1.515
HH health status (ref: Prop. of households with good SAH)			
Prop. of household with fair SAH	1.406	1.118	0.917
Prop. of household with low SAH	0.0311*	0.359	1.468
Consumption quintiles (ref: poorest quintile)			
2nd quintile	1.351	1.805	0.459***
3rd quintile	1.165	2.203*	0.472***
4th quintile	0.855	3.414***	0.293***
Richest quintile	1.338	2.987**	0.440***
Trust in modern heath care (ref: disagree)			
Agree	3.602**	1.222	2.442***
Neither agree nor disagree	2.524	0.587	4.947***
Access to public infrastructure			
Water using from public sources	0.675	0.553***	0.940
Use electricity	0.948	1.469	0.404**
No TV signal	1.045	1.271	1.573**
No mobile signal	0.384***	0.753	0.842
Travel time to the nearest health post (in minutes)	0.988*	0.997	0.993*
Travel time to the nearest health centre (in minutes)	1.010***	1.002	1.008***
Travel time to the nearest	0.989***	0.997	0.997**

public			
hospital (in minutes)			
Religion of the head (ref: Muslim)			
Orthodox Christian	0.520**	0.152***	0.198***
Protestant	0.184***	0.0884***	0.132***
Other religion or no religion	0.424	0.364	0.111***
Regions(ref: SNNPR)			
Tigray	0.0782***	0.808	0.653
Amhara	0.216***	0.578	0.0740***
Oromiya	0.324**	0.369	0.0404***
Pseudo R^2		0.183	
N		1,545	

Notes: *** p<0.01, ** p<0.05, * p<0.1. The reference outcome is health centres. Other care options include do nothing, traditional healers, religious healers, pharmacies/drug stores and health posts.

3.5.3 When to seek care

While the responses to the vignettes suggest that foregone care is quite limited in the Ethiopian context it is possible that households respond to symptoms with a time lag. In the case of all five vignettes the appropriate reaction in response to the symptoms described is immediate medical attention.

Table 3.5 displays the distribution of the time lag between the onset of symptoms and the action of respondents. For both the child-related vignettes the reaction of respondents is swift and 91 percent report that they would seek care immediately or the next day in the case of ARI/pneumonia while the corresponding figure for diarrhea is 85 percent. For the other cases the response is slower and ranges from an immediate/next day response rate of 46 percent for tuberculosis to 59-60 percent for malaria and tetanus. For tuberculosis the reaction time is quite slow with about a quarter of respondents indicating that they would wait for a week or more after the onset of symptoms. The sharp differences in reaction times across the two sets of vignettes may be attributed to a greater concern for children as opposed to adults or perhaps more likely and consistent with the expansion of the health extension program, due to greater knowledge of the symptoms and markers of child-related diseases.

Odds ratios based on a set of vignette specific ordered logit estimates are provided in Table 3.9. To aid interpretation, note that the dependent variable is increasing in time to seek care. Age and sex of the household head and demographic composition of the household do not influence the timing of care-seeking. However, across the various cases, educational attainment seems to play a stronger role in influencing timing of care as opposed to choice of health care provider. For instance, in the case of tuberculosis, household heads with informal education are 1.6 times more likely to delay seeking immediate care as opposed to those with secondary education. Similarly, for diarrhea, malaria, and tetanus vignettes, the estimates show that household heads with primary or secondary education are systematically more likely to seek care immediately as opposed to their less educated counterparts. The effects of household economic status as captured by consumption quintiles indicate that households in richer quintiles are more likely to seek care immediately. For instance in the case of ARI/pneumonia households in the two highest quintiles are 33 (1 – 0.67) to 38 (1 – 0.62) percent more likely to seek care immediately as compared to households in lower consumption quintiles. Similar patterns prevail for malaria and tetanus although not for diarrhea and tuberculosis.

The link between religion of the household head and the time of health care seeking behaviour varies across vignettes. For the case of child symptoms (ARI/pneumonia and diarrhea), Orthodox Christians are more likely to delay care than Muslims while the reverse is true for the adult-vignettes (malaria, tetanus, and tuberculosis). Regional differences continue to remain pronounced. Almost, across all the vignettes households living in the Amhara and Tigray region display a greater propensity to seek care immediately as compared to households living in SNNPR. Differences are particularly pronounced in the case of the Amahra region where households are at least 75 percent (1 – 0.25 in the case of tetanus) more likely to seek care immediately as opposed to households living in SNNPR.

Table 3.9
When to seek modern care - Odds ratios based on ordered logit specifications

Variables	*ARI / Pneumonia*	*Diarrhea*	*Malaria*	*Tetanus*	*Tuberculosis*
Head sex	1.329	0.899	1.354*	1.282	0.993
Head age	1.006	1.008	0.993	0.998	1.004
Head's education (ref: no education at all)					
Informal education	1.019	0.913	0.944	0.810	1.601***
Primary	0.806	0.656***	0.669***	0.796*	1.052
Secondary or post-secondary	0.368***	0.622*	0.403***	0.788	0.502**
Household size	0.979	0.993	0.917***	0.902***	0.953
HH composition (ref: Prop. of male adults aged 16 to 64)					
Prop. of children aged under 6	1.087	0.862	0.711	1.091	3.187**
Prop. of males aged 6 to 15	1.209	0.838	0.806	1.277	1.313
Prop. of females aged 6 to 15	1.005	0.980	1.862	1.619	7.202***
Prop. of females aged 16 to 64	1.324	1.047	1.092	1.281	1.287
Prop. of elderly aged above 64	1.049	0.763	1.088	1.099	1.836
HH health status (ref: Prop. of household with good SAH)					
Prop. of household with fair SAH	0.828	0.719*	1.605***	1.103	1.056
Prop. of household with poor SAH	2.495**	2.493**	2.269**	1.603	2.363*
Consumption quintiles (ref: poorest quintile)					
2nd quintile	0.940	0.839	1.077	0.988	0.952
3rd quintile	0.824	0.931	0.849	0.647***	0.949
4th quintile	0.673**	0.858	0.567***	0.523***	0.852
Richest quintile	0.622**	1.011	0.645**	0.483***	1.040
Trust in modern heath care (ref: disagree)					
Agree	1.533**	1.496**	0.824	0.827	1.742***

Neither agree nor disagree	1.763**	1.198	0.442***	0.594**	0.832
Access to public infrastructure					
Water using from public sources	0.755**	1.019	0.762**	0.797**	0.909
Use electricity	0.626*	0.626**	1.117	0.679*	0.965
No TV signal	0.701**	0.478***	0.487***	0.545***	0.456***
No mobile signal	1.131	0.904	1.189	1.206	2.074***
Travel time to the nearest health post (in minutes)	0.994**	0.992***	0.994**	1.005**	1.000
Travel time to the nearest health centre (in minutes)	0.997**	1.002	1.002	1.000	1.000
Travel time to the nearest public hospital (in minutes)	1.004***	1.001	1.003***	1.002**	1.004***
Religion of the head (ref: Muslim)					
Orthodox Christian	2.146***	1.287*	0.768*	0.676***	0.428***
Protestant	1.412	1.259	1.249	0.870	0.846
Other religion or no religion	2.846**	1.536	3.572***	1.865	1.617
Regions (ref: SNNPR)					
Tigray	0.393***	0.780	0.722	0.546**	0.508*
Amhara	0.143***	0.211***	0.241***	0.250***	0.144***
Oromiya	0.519**	1.108	1.819**	1.265	1.089
Pseudo R^2	0.087	0.066	0.067	0.053	0.091
N	1,502	1,518	1,475	1,477	1,192

Notes: *** p<0.01, ** p<0.05, * p<0.1. Except for the estimates in the last column, the modern health care option includes health posts, health centres, private clinics, mission/NGO clinics, public hospitals, private hospital, and mission/NGO hospitals. In the case of tuberculosis, health posts are not included as part of the modern care option.

3.5.4 Differences in health care seeking behaviour across vignettes

Although differences in health care seeking behaviour across the different vignettes is already apparent, in order to provide a clearer comparative sense of these differences we reshaped the data and estimated models for whether, where and when to seek care conditioning on the clinical vignette by including a set of four indicator variables with ARI/Pneumonia as the reference case. The specifications also contain the set of covariates described in Table 3.4.

The various estimates provided in Table 3.10 highlight the differences in the type of care and the timing of care for child-related diseases as compared to adult-related conditions. Households appear to be far more willing to seek modern care for ARI/pneumonia and diarrhea as compared to malaria and tetanus. For both malaria and tetanus, households are about 40 percent less likely to seek modern care as compared to ARI/pneumonia. Another notable pattern pertains to the timing of care. Once more there is a clear difference between child and adult related conditions with households about 4 to 9 times more likely to delay seeking immediate care as opposed to ARI/pneumonia. The difference as compared to diarrhea is somewhat less (about 2 to 8 times) but still substantial. Estimates of the type of health care sought also show that households are more likely to seek care from higher levels of the health care system for adult-related conditions with households substantially more likely to opt for treatment from health centres and hospitals for malaria, tetanus and especially for tuberculosis. The differences in health-care seeking behaviour may be due to a greater parental/household concern for children or, as is consistent with our knowledge of the context and recent developments introduced in the Ethiopian health care system, due to the widespread dissemination of information and knowledge and the appropriate course of action for child-related diseases.

Table 3.10
Health care seeking behaviour across vignettes[a]

Variables	Probability of seeking modern care b	Where to seek care c				When to seek care d
		Health centre	Private / NGO clinic	Public / Private / NGO hospital	Other care Options e	
	(1)	(2)	(3)	(4)	(5)	(6)
Case vignette (reference ARI/pneumonia)						
Diarrhea	1.500**	1.041	1.538***	1.913***	1.411**	1.457***
Malaria	0.607***	4.101***	3.002***	4.056***	7.858***	4.191***
Tetanus	0.616***	2.355***	2.402***	3.405***	6.496***	3.811***
Tuberculosis	1.072	2.266***	3.280***	4.233***	21.01***	9.211***
Pseudo R^2	0.142			0.186		0.098
N	7,728			7,622		7,472

Notes: *** p<0.01, ** p<0.05, * p<0.1; Standard errors have been adjusted for clustering at the level of the respondent. [a] All regressions in the table control for individual and household characteristics, access to public infrastructure and regional dummies. [b] Logit, odds ratios. [c] Multinomial logit, reference outcome is health post, table contains relative risk ratios. [d]Ordered logit, odds ratios. [e] Other care options include do nothing,

3.6 Conclusions

Ethiopia has invested substantially in its health care infrastructure in the last decade through the expansion of health posts and health centres. Despite these investments, utilization of maternal and child care and more general outpatient utilization rates remain among the lowest in Sub-Saharan Africa.[16] The gap between availability and utilization is likely to be driven by three sets of factors, including, supply-side constraints such as the availability and quality of care, demand-side constraints such as price or knowledge constraints (so-called suppressed demand) driven by difficulties in understanding disease symptoms and a low perceived need for modern health care. To gain an understanding of the factors responsible for driving a wedge between availability and utilization this paper relied on five context-relevant clinical vignettes for common child (ARI/pneumonia and diarrhea) and adult (malaria, tetanus and tuberculosis) conditions to probe whether households seek modern care, where they seek care and the timing of care-seeking behaviour.

The estimates suggest that the large majority of respondents recognize the severity of the symptoms described in the vignettes and prefer modern over traditional care and self-treatment. This is especially the case for child related conditions and might be related to the health education campaigns that have taken place in recent years in the context of the Health Extension Program. Indeed, the uniformity of health care seeking behaviour for child morbidity displayed across consumption quintiles suggests that information on health education and the appropriate course of action for the most common childhood diseases, which is the focus of the health extension program, seems to have percolated to the lowest socioeconomic quintiles.

For adult related conditions, we do find variations across socioeconomic status with households in the highest consumption quintile two to three times more likely to seek modern care as compared to households in the lowest quintiles. These socioeconomic inequalities are also found in the choice of health care provider, and the timing of seeking care. Households in the lowest consumption quintiles are generally more likely to resort to lower level care and postpone seeking care compared to better off households. Taking the example of tuberculosis, which can only be properly treated in health centres and hospitals, we find that households in the upper consumption quintile are three times more likely to seek care in a hospital compared to those in the poorest. We also find variation in the timing of care seeking behaviour with respondents typically acting faster for child related conditions as compared to adult conditions.

There are some limitations to this paper. While the use of clinical vignettes allows us to establish patterns of health care seeking behaviour across population groups that are not driven by differences in health status, there is the risk that reported hypothetical health care seeking behaviour does not match actual health care seeking behaviour. However, the overwhelming reliance on modern care found in the actual utilization data does suggest that results from the vignettes analysis are able to capture preferences and are not merely a result lack of understanding of the survey instrument. Second, while we have detailed information on individual and household (demand side) characteristics, we do not have information on health care supply, apart from the distance to health care facilities, which can be linked to the household data. The importance of the regional fixed effects in all the models suggests that variations in implementation of the fee waiver system and regional differences in quality of care are important

and need to be considered.

Notwithstanding these limitations, based on the empirical evidence assembled in the paper we tend to conclude that the low utilization rates in Ethiopia are unlikely to be linked to lack of awareness of the symptoms of the most common diseases or a low-perceived need for health care but are more likely to be related to the quality and cost of available care. With regard to the latter, the scaling-up of the recently introduced community-based health insurance schemes may play an important role in reducing socioeconomic inequalities in access to health care.

Notes

[1] A shorter version of this paper has been published in *BMJ Open* 4 (2014): 1-12, doi:10.1136/bmjopen-2013-004020. It is also available as Institute of Social Studies Working Paper No. 551 (2013). The paper is co-authored with Ellen van de Poel, Zelalem Yilma, Degnet Abebaw, Getnet Alemu, and Arjun S. Bedi. The manuscript benefited from useful comments and suggestions of the conference/workshop participants at the International workshop on Health Shocks and Community Based Health Insurance in Rural Ethiopia, Addis Ababa, Ethiopia, February 2014; and the fourth Amhara Region Economic Development Conference, Bahir Dar, Ethiopia, August 2012.

[2] A recent exception is Benziger et al. (2011) - based on a vignette designed to capture acute coronary syndrome (ACS) Benziger et al. (2011) report that women in Peru are less likely to recognize the symptoms of ACS and also less likely to seek health care for chest pain as compared to men.

[3] Typically, health extension workers are females who come from the local communities and they speak the local language.

[4] A health officer is expected to have completed a 4 year university course after 12 years of basic and high school.

[5] In each region the four districts were selected to include both resource-poor, that is, food-insecure districts and relatively better-off districts.

[6] While the facility data are drawn from facilities located in the same district in which the household survey was conducted it is not possible to map the facility data to the household data as the facility survey does not cover all the facilities in a district. Additionally, there are no restrictions in terms of the facility which a household may visit.

[7] In order to reduce errors, the clinical vignettes were pretested in the study regions and were subsequently amended. The household survey was conducted by enumerators who have at least an undergraduate degree and speak the local language. Enumerators and supervisors were trained for two days on how to conduct the

survey including the vignettes section. During training, special attention was given to inform the trainees how they had to ask the vignette questions so that the respondents could reveal what they would actually do if they or someone in their family suffered from the illness symptoms listed in the vignettes. Every questionnaire was also checked by trained supervisors the same day the information was collected and whenever there were mistakes the enumerator had to go back to the household to correct them. During the survey period, I and other authors/researchers went to the field to provide support to the enumerators and supervisors.

[8] According to the WHO's country health profile the most prominent cause of death among Ethiopian children under the age of five is pneumonia which accounts for 21 percent of child deaths. Diarrhea also figures prominently accounting for 14 percent of child deaths. In terms of burden of disease (BOD), diarrhea, respiratory infections, malaria and unintentional injuries are the four most prominent contributors to the country's BOD (see http://www.who.int/gho/countries/eth.pdf - accessed on August 21, 2012).

[9] In the context of anchoring vignettes (e.g. Bago d'Uva et al., 2008) the use of self-referential vignettes is avoided to make the assumption of vignette equivalence (different respondents interpret the same vignette in the same way) more likely. In the present context, vignette equivalence is less likely to be violated because the vignettes are more specific than those typically used to correct for self-assessed health. Furthermore, while testing the survey tool we found that respondents had difficulties responding to vignettes that did not relate to their own household.

[10] Based on a survey of 32 health posts we found that 24 of 32 facilities had medicines to deal with malaria while only 18 of 32 had stocks of oral rehydration salts. Medical equipment, for example, thermometers were available in 15 of 32 posts, stethoscopes in 11 of 32 and sphygmomanometers in 22 of 32 posts. Comparatively, posts in the Amhara region appeared to be the most well-stocked in terms of equipment (6 of 8 had thermometers, 7 of 8 had stethoscopes and all had sphygmomanometers).

[11] Unlike health posts, health centres appear to face limited drug availability problems. In general, only seven of the 48 facilities indicated that they faced drug shortages. However, there are variations in terms of the availability of specific drugs. Pertinent to the current analysis, drugs to treat respiratory infections and malaria were available in all health centres; for gastro-intestinal conditions drugs were unavailable in two health centres and drugs for diseases affecting the central nervous system (tetanus) were unavailable in 20 health centres. While drug availability may be less of a concern, staffing falls short of requirements. While each health centre is expected to have two health officers, in 27 of the 48 centres there was only one health officer.

[12] 'Other care' includes do nothing, traditional healers, religious healers, and visiting a pharmacy/drug store.

[13] Foregone care refers to not using either modern or other care options despite experiencing an illness.

[14] The consistency between hypothetical and actual behavior reported here is also supported by research done in other contexts. For instance, van der Meer and Mackenbach (1998) show s strong link between a reported tendency to consult a doctor and observed consultation rates. For more on this issue see Frie (2010) and references therein.

[15] This may not be obvious as in the case of the other vignettes as the baseline category in this case is health centres.

[16] In the baseline household survey, the share of individuals who used outpatient care from modern providers at least once during the two months recall period is only 7 percent (690 out of 9455 individuals) which is comparable to the national report.

4 Enrolment in Ethiopia's Community Based Health Insurance scheme[1]

Abstract

In June 2011, the Government of Ethiopia rolled out a pilot Community Based Health Insurance (CBHI) scheme. This paper assesses scheme uptake. We examine whether the scheme is inclusive, the role of health status in inducing enrolment and the effect of the quality of health care on uptake. By December 2012, scheme uptake had reached an impressive 45.5 percent of target households. We find that a household's socio-economic status does not inhibit uptake and the most food-insecure households are substantially more likely to enrol. Recent illnesses, incidence of chronic diseases and self-assessed health status do not induce enrolment, while there is a positive link between past expenditure on outpatient care and enrolment. A relative novelty is the identification of the quality of health care on enrolment. We find that the availability of medical equipment and waiting time to see a medical professional play a substantial role in determining enrolment. Focus group discussions raise concerns about the behaviour of health care providers who tend to provide preferential treatment to uninsured households. Nevertheless, the start of the pilot scheme has been impressive and despite some concerns, almost all insured households indicate their intention to renew membership and more than half of uninsured households indicate a desire to enrol. While this augurs well, the estimates suggest that expanding uptake will require continued investments in the quality of health care.

4.1 Introduction

Over the past decade, Ethiopia has recorded notable progress in a number of population health outcomes. For instance child mortality per 1000 live births has fallen from 166 in 2000 to 88 in 2011 and maternal mor-

tality rates have declined from 871 to 676 per 100,000 live births. These changes have been accompanied by a rapid expansion of health-care infrastructure at all levels. According to Ethiopia's Federal Ministry of Health (FMoH, 2011), there has been an 18-fold increase in the number of health posts from 833 in 2000 to 15,095 in 2011 and a 7-fold increase (356 to 2,660) in the number of health centres over the same period. Consequently it is estimated that primary health care coverage, defined as village-level access to a health post, has increased from 51 percent in 2000 to 92 percent in 2011.

Despite these increases in the supply of health care and increases in the utilization of some specific services, overall utilization rates remain low. For example, according to the Ethiopian Demographic and Health Surveys, outpatient health care utilization per capita per year has increased only marginally from 0.27 visits in 2000 to 0.3 visits in 2011. The low utilization rates are accompanied by a high reliance on out-of-pocket (OOP) spending to finance health care. The FMoH (2010) estimates that the three main sources of health-care financing in Ethiopia are local and international donors (40 percent), out-of-pocket (OOP) spending by health-care users (37 percent), and central and local governments (21 percent). The remainder (about 2 percent) is covered by employer and other private insurance schemes.

Since the late 1990s, as an alternative to informal risk-pooling approaches, community-based health insurance schemes (CBHI) which involve potential clients in determining scheme benefits and scheme management have been implemented in several developing countries. Matching the roll-out of these schemes, theoretical and especially empirical studies which examine their impact on outcomes such as utilization of healthcare, financial protection, resource mobilization and social exclusion have proliferated. Early reviews of this body of work are provided by Jakab and Krishnan (2001) and Preker et al. (2002). Based on 45 published and unpublished works, Jakab and Krishnan (2001) conclude that there is convincing evidence that community health financing schemes are able to mobilize resources to finance healthcare needs, and that such schemes are effective in terms of reaching low-income groups although the lowest-income groups are often excluded. As opposed to these two narrative reviews, Ekman (2004) provides a systematic review of the literature based on 36 studies conducted between 1980 and 2002. Echoing previous findings, Ekman (2004) concludes that while such

schemes do provide financial protection for low income groups, the magnitude of the effect is small and the lowest income groups are excluded from enrolment. More recently, based on a systematic review of 46 papers published between 1995 and 2012, among other aspects, Mebratie et al. (2013) examine the extent of social exclusion and adverse selection in CBHI schemes. They conclude that a majority of papers (61 percent, 11 out of 18) find statistically significant evidence of exclusion of the lowest income groups from CBHI schemes. Even when such households become members, they tend to use healthcare services less intensively as compared to higher income groups potentially due to their inability to afford co-payments and other related costs (transportation and forgone income). They also report that about 67 percent (6 out of 9) of the studies find evidence that individuals suffering from chronic health conditions, a proxy for adverse selection, are more likely to join CBHI schemes as compared to those in good health.

In July 2011, with the aim of enhancing access to health care and reducing the burden of OOP expenditure, the Government of Ethiopia launched a pilot Community Based Health Insurance (CBHI) scheme. The scheme which caters to rural households and urban informal sector workers was rolled out in 13 districts located in four main regions (Tigray, Amhara, Oromiya, and SNNPR) of the country. The aim of this paper is to examine and identify factors that drive scheme enrolment. While straightforward this issue is pertinent from a policy perspective as the government plans a nation-wide roll-out of the scheme and hence it is important to examine what factors drive or deter enrolment.

In addition to the policy relevance, the paper offers several innovative elements. First, unlike the bulk of the literature which relies on examining the effect of current traits (such as individual health conditions) on current enrolment and relies on a single post-intervention cross-section of data, we are able to draw on two household surveys canvassed before and after the launch of the CBHI scheme to examine enrolment in 2012 as a function of individual, household and community traits in 2011.[2] This enables us to provide estimates that are less likely to be influenced by the endogenous nature of some of the explanatory variables. For instance, in the case of papers relying on post-intervention data, health status and enrolment in CBHI may be endogenous. Second, the paper

draws on both survey data and qualitative information gathered through a series of key informant interviews (KII) and focus group discussions (FGD) to identify factors that drive or deter enrolment. A final novelty is that we are able to combine data from a health facility survey conducted prior to the launch of the CBHI scheme with the household survey data to examine the role played by the quality of health care in determining enrolment. While some studies (Aggarwal, 2010; Chankova et al., 2008, Shimeles, 2010) do control for access to health care by including variables such as distance to the nearest health facility we are able to push further by directly examining the role of health care quality (for example, educational level of health professionals, availability of medical equipment).

The article unfolds by providing in the next section a description of the key design features of the pilot scheme. Section three describes the data, section four discusses the research methods, section five contains empirical results and the final section concludes.

4.2 Key features of the Ethiopian CBHI scheme

In June 2011 the Ethiopian CBHI scheme was rolled out in 13 pilot districts in four main regions (*Tigray, Amhara, Oromiya,* and *SNNPR*) of the country.[3] The pilot districts were selected by regional administrative bodies based on directives provided by the Federal Ministry of Health (FMoH). While the chosen districts were expected to fulfil five selection criteria, in practice, selection was based on two conditions. Namely, the district should have undertaken health care financing reforms designed to increase cost recovery and retention of locally raised revenues and that health centres in these districts should be geographically accessible (located close to a main road).[4]

The scheme was introduced by Ethiopia's, Federal Ministry of Health (FMoH) in collaboration with USAID, Abt Associates Inc. an international consultancy company and CARE Ethiopia an international non-governmental organization. The scheme is part of the government's broader health care financing reform strategy which aims to improve quality and coverage of health services by identifying alternative healthcare resources (USAID, 2011). Feasibility studies, scheme design and scheme promotion were outsourced to Abt Associates and CARE Ethiopia. The basic design of the scheme in terms of benefit packages,

registration fees and premium payments, co-payments were determined on the basis of feasibility studies and in collaboration with regional governments and are the same within each of the pilot regions but differ slightly across regions. Scheme implementation and monitoring is conducted by Abt Associates in collaboration with relevant government authorities at the central, regional, district, and village levels.

While the scheme has been introduced by the government, it is 'community based' in the sense that the community determines whether or not to join the scheme and is subsequently involved in scheme management and supervision.[5] In particular, after being exposed to a range of awareness creation activities a general assembly at the village *(kebele)* level decided whether or not to join the scheme (a simple majority had to support the decision) and then households decide individually whether to enrol in the scheme.[6] In order to reduce the possibility of adverse selection the unit of membership is the household rather than the individual and new members can use their CBHI card to get healthcare services after waiting for at least for one month (FMoH, 2008).

Based on feasibility studies conducted by Abt associates, regional health administration officials determined the premiums to be charged. Household level monthly premiums for core household members range between ETB 10.50 in SNNPR to ETB 15 in Oromiya (see Table 4.1).[7] For each non-core household member the monthly premium lies between ETB 2.10 and ETB 3.00. Premiums in Amhara region are set at ETB 3.00 per individual per month. The premiums amount to about 1-3 percent of household monthly income.[8] To enhance affordability the central government subsidizes a quarter of the premium and district and regional governments are expected to cover the costs of providing a fee waiver to the poorest 10 percent of the population or so called "indigent groups".[9]

Table 4.1
CBHI in Ethiopia – Premiums, payment intervals and enrolment

Region	*Unit of contribution*	*Premium per month*		*Payment interval*	*CBHI uptake in April 2012 (%)*
		Core household members	*Per extended family member*		
Tigray	Household	ETB 11.00	ETB 2.50	Annual	34
Amhara	Individual	ETB 3.00	ETB 3.00	Biannual	49
Oromiya	Household	ETB 15.00	ETB 3.00	Gimbichu district - annual	44
				Kuyu, Deder, and L. Kossa districts - annual or biannual	
SNNPR	Household	ETB 10.50	ETB 2.10	Yirgalem and D. Woyde – quarterly	35
				Damboya - three times a year	
Total					41

Notes: In addition to the premiums there is a one-time registration fee of ETB 5.00 per household.
Source: Abt Associates and key informant interviews at the federal, district and regional levels. CBHI uptake rates are the authors' calculations based on the 2012 round of the household survey.

Premium collection intervals differ across pilot districts and are sensitive to local conditions. While local level officials and community representatives are able to adjust the interval of premium collection they cannot change the premium. In order to enable community engagement every village is expected to select 3 delegates/CBHI members who will be part of the village CBHI administrative bodies and participate in the general assembly organized at district level.[10] According to information obtained from key informant interviews and focus group discussions, village level government officials and the community at large are involved in identifying the poorest households and implementing the fee waiver arrangement.

The scheme covers both outpatient and inpatient health care services in public facilities. Transportation costs to access health facilities are not covered. Utilization of care from private providers is usually not permitted unless a particular service or drug is unavailable at a public facility.

Treatment outside the country is not covered. Scheme participants are expected to access health providers who have signed a contractual agreement with district level CBHI administrators. The selection of the facilities takes into account a number of factors such as quality of the care (in terms of human resource and equipment), geographical proximity between the providers and the location of the target households, implementation of the healthcare financing reform, and service charges. There is no upfront payment at the time of service utilization if treatment is obtained from those facilities which have contractual agreements with the scheme. In Tigray, Amhara, and Oromiya regions, CBHI members are allowed to use care from public facilities that do not have formal contractual agreements with the scheme and then claim reimbursement. There is no reimbursement for service utilization outside CBHI linked facilities in SNNPR.

Medical treatments which have largely cosmetic value (for example, artificial teeth and plastic surgery) are excluded. There are no co-payments as long as members follow the scheme's referral procedure. When they seek care, scheme members are first expected to visit a health centre and can subsequently access higher level care at district or regional hospitals as long as they have referral letters from the health centre. Members who visit hospitals without referral letters need to cover 50 percent of their costs. Access to tertiary level care differs across regions. In Amhara and Tigray, CBHI enrolees may visit any public hospital within the region but not outside the region. In SNNPR, care is covered only in the nearest public hospital while in Oromiya coverage includes hospitals located outside the region.

According to our survey data, scheme uptake was 41 percent in April 2012 (see Table 4.1) and according to Abt Associates uptake reached 45.5 percent in December 2012 (see Table 4.2). As compared to the experience of several other African countries the speed of uptake is remarkable. For instance, uptake in Mali was 11.4 percent after six years (Diop et al., 2006), 4.8 percent after two years in Senegal (Smith and Sulzbach, 2008), 2.8 percent in Tanzania after six years (Chee et al., 2002), 35 percent in Rwanda after seven years and 85 percent after nine years (Shimeles, 2010).

Table 4.2
CBHI uptake and fee waiver beneficiaries up to December 31, 2012

Region	*No of Eligible HHs*	*Registered HHs*					
		Paying		*Non-paying*		*Total*	
		%	*N*	*%*	*N*	*%*	*N*
Tigray	75,190	33.4	25,101	11.5	8,651	44.9	33,752
Amhara	86,628	42.0	36,412	16.0	13,865	58.0	50,277
Oromiya	106,674	29.3	31,301	2.6	2,750	31.9	34,051
SNNPR	32,113	53.6	17,228	4.2	1,342	57.8	18,570
Total	**300,605**	**36.6**	**110,042**	**8.9**	**26,608**	**45.5**	**136,650**

Source: Abt Associates, Addis Ababa

4.3 Data description

This paper draws on three different types of data – two rounds of a longitudinal household survey, a health facility survey, and qualitative information from key informant interviews and focus group discussions.

Prior to the launch of the CBHI scheme in July 2011, a baseline household survey was conducted between March and April 2011 and a follow up survey was undertaken between March and April 2012. The household surveys cover 12 of the 13 CBHI pilot districts and 4 non-intervention districts located in four regions (*Tigray, Amhara, Oromoya, and SNNPR*).[11] The sampling strategy and further detail on the households survey is provided in chapter three. This paper is based on the surveys conducted in the CBHI pilot districts which include a total of 1,224 households in 2011, of which 1,203 were interviewed again in 2012.[12]

In addition to an extensive module on household and individual health conditions, the surveys contain information on a variety of individual and household socio-economic attributes (consumption expenditure, assets, household demographics, employment), access to formal and informal sources of credit, and involvement in social networks. The health module includes questions regarding self-rated health status and outpatient and inpatient health care utilization for each household mem-

ber. The recall period for outpatient health care is two months preceding the survey while it is 12 months in the case of inpatient health care. Medical health expenditure including transport costs, consultation and diagnosis costs, drug costs and other health care related expenses for each episode of health care consumption are recorded. The second round of the survey enquired whether households had enrolled in the CBHI, and their reasons for doing so.

While the household surveys contain information on access to health facilities (travel time to reach the nearest health facilities), in order to assess and potentially control for the quality of health care services in determining enrolment, we combine the surveys with information gathered from 48 health care centres (3 randomly selected health centres from each of the 16 districts). We focused on health centres as these are usually the main source of curative health care in rural Ethiopia. The health facility survey was canvassed between April and May 2011, that is, before the introduction of the CBHI scheme. The health facility survey contains information on the educational qualifications and work experience of the head of the facility, availability of medical equipment, and the head's (self-) assessment of the quality of care provided by the facility. In addition, the survey obtained information from five randomly chosen patients who were exiting from the health centre, on the time taken to obtain a patient registration card and time taken between obtaining the registration card and consulting with a health care professional. Based on information provided by the district health offices, households from the 96 sampled villages were matched to the 48 health centres on the basis of household proximity to the health centres.[13]

In order to understand the overall vision of the scheme and to gain a clearer understanding of design, operation and implementation issues at different levels of government, between December 2012 and January 2013, 15 key informant interviews were conducted. These interviews include FMoH, Abt Associates, Care Ethiopia, four regional level CBHI coordinators, four district level CBHI officials and four village level CBHI managers from each of the pilot region. Eight focus group discussions, two in each of four villages randomly selected per region, were conducted with groups of 7 to 12 individuals. Each FGD had at least three and at most six female participants. One of the FGDs was con-

ducted with scheme members and focused on their motivation for joining the scheme and their views on scheme operation while the other was conducted with non-members and focused on why they had chosen not to join the scheme.

4.4 Empirical framework

We treat the probability that a household enrols in the *CBHI* scheme as a function of a range of factors that are likely to influence both the demand for health insurance and for health care. In particular, we focus on the role of three main sets of variables, that is, household socio-economic status, health status and past use of health care services, and access to and quality of health care, in determining enrolment. The enrolment status of household *h* in time period *t* (2012) is expressed as a function of various sets of variables in period *t-1* (2011) and written as,

$$\mathrm{P}\left(CBHI_{ht}=1\right)=F\left(\begin{array}{l}\alpha' SES_{ht-1}+\theta' DE_{ht-1}+\beta' HS_{ht-1}+\gamma' FISC_{ht-1}+\delta' SSA_{ht-1}\\ +\eta' SSQ_{ht-1}+\varepsilon_{ht}\end{array}\right) \quad (1)$$

where, *CBHI* is a binary variable with a value of 1 if a household is enrolled in the scheme and zero, otherwise. Socio-economic status (*SES*) is a set of variables that includes the educational status of the head of the household, whether a household participates in a social security programme called the productive safety net programme (*PSNP*) which targets chronically food insecure households and the consumption quintile in which a household falls.[14] [15] *DE* is a set of variables that captures the demographic profile of households and includes the gender of the household head, household size, proportion of male and female household members in different age groups and religion of the household head. To account for the role of a household's health status, past illnesses, health care use and health care expenditure in determining enrolment status we include a set of variables (*HS*) indicating past illness events, incidence of chronic disease, use of outpatient and inpatient care, outpatient and impatient health care expenditure, and household self-reported health status (good, fair, poor). *FISC* includes variables that control for access to formal and informal sources of credit and the strength of a household's social network. These include variables such as whether a

household has savings in a bank account, outstanding loans, is a member of a credit and savings association, and member of an *Iqqub*.[16] The strength of a household's social network is proxied, amongst other variables, by membership in a *Wonfel* or a *Debo*, membership in church/mosque based religious groups, and whether any household member has ever held or holds an official government position.[17]

We include two sets of supply side characteristics. One set, access to health care facilities (*SSA*) includes travel time to health centres and hospitals while a second set (*SSQ*) includes a range of variables to capture the quality of health care on offer. This includes information on the education and training of the head of the facility, availability of medical equipment, waiting time to obtain a patient card and to see a medical care provider and the perception of the quality of care provided by the facility as reported by its head.[18] In addition, we also include a set of regional controls and control for community level access to infrastructure (roads, access to water and electricity).

A description of the variables and summary statistics are provided in Table A4.1 and Table 4.3, respectively.

Table 4.3
Descriptive statistics by insurance status, 2011

Variable	*Enrolled*		*Non-Enrolled*		*Mean differences p-value*	*Total*	
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*
Socioeconomic status							
Poorest consumption quintile	0.23	0.42	0.18	0.39	0.0462	0.20	0.40
2nd consumption quintile	0.20	0.40	0.20	0.40	0.9255	0.20	0.40
3rd consumption quintile	0.19	0.39	0.21	0.41	0.3832	0.20	0.40
4th consumption quintile	0.18	0.38	0.21	0.41	0.1301	0.20	0.40
Richest consumption quintile	0.20	0.40	0.20	0.40	0.7655	0.20	0.40
HH head education- No education at all	0.42	0.49	0.48	0.50	0.0387	0.46	0.50
HH head education- Informal	0.16	0.37	0.11	0.32	0.0214	0.13	0.34
HH head education- Primary or above	0.42	0.49	0.40	0.49	0.6313	0.41	0.49
Participates in PSNP	0.28	0.45	0.17	0.38	0.0000	0.21	0.41
Demographic traits							
Male headed HH	0.90	0.31	0.84	0.36	0.0108	0.87	0.34
Age of HH head	46.91	12.68	46.79	14.75	0.8860	46.84	13.96
Household size	6.25	2.21	5.61	2.26	0.0000	5.87	2.26
Prop. of children aged under 6	0.13	0.14	0.15	0.16	0.0669	0.14	0.15
Prop. of male aged 6 to 15	0.17	0.15	0.15	0.15	0.0766	0.16	0.15
Prop. of female aged 6 to 15	0.16	0.14	0.14	0.15	0.0108	0.15	0.15
Prop. of male aged 16 to 64	0.26	0.15	0.25	0.17	0.4008	0.25	0.16
Prop. of female aged 16 to 64	0.25	0.14	0.26	0.16	0.7691	0.25	0.15
Prop. of elderly aged above 64	0.03	0.11	0.06	0.18	0.0029	0.05	0.15
HH head religion - Orthodox Christian	0.62	0.49	0.59	0.49	0.3421	0.61	0.49
HH head religion - Protestant	0.18	0.38	0.21	0.41	0.1920	0.20	0.40

Variable	*Enrolled*		*Non-Enrolled*		*Mean differences p-value*	*Total*	
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*
HH head religion – Muslim	0.19	0.39	0.17	0.38	0.4022	0.18	0.38
HH head religion - Other religion or no religion	0.01	0.10	0.03	0.16	0.0535	0.02	0.14
Health status and health care use							
Prop. of household members with good SAH	0.81	0.32	0.74	0.38	0.0015	0.77	0.35
Prop. of household members with fair SAH	0.15	0.29	0.21	0.35	0.0016	0.18	0.33
Prop. of household members with low SAH	0.05	0.13	0.05	0.16	0.4860	0.05	0.15
Past illness event	8.75	16.06	9.13	16.61	0.6881	8.98	16.39
Chronic illness	0.24	0.65	0.35	0.31	0.0216	0.31	0.82
Outpatient care use	0.39	0.49	0.38	0.48	0.6288	0.38	0.49
Inpatient care use	0.03	0.17	0.03	0.18	0.6913	0.03	0.17
Duration of hospitalization	0.37	2.61	0.59	8.04	0.5678	0.50	6.44
Outpatient healthcare expenditure	80.21	307.81	42.33	129.87	0.0031	57.47	219.71
Inpatient healthcare expenditure	44.40	415.49	40.81	451.0	0.8883	8.98	16.39
Trust in modern care - Disagree	0.06	0.23	0.06	0.23	0.8683	0.06	0.23
Trust in modern care - Neither agree nor disagree	0.04	0.20	0.06	0.23	0.2621	0.05	0.22
Trust in modern care - Agree	0.90	0.30	0.89	0.32	0.3564	0.89	0.31
Formal and informal access to credit and networks							
Member of *Iqqub*	0.08	0.27	0.06	0.24	0.1140	0.07	0.25
Member of credit & saving association	0.17	0.38	0.09	0.29	0.0000	0.12	0.33
Member of religious group	0.59	0.49	0.60	0.49	0.8083	0.59	0.49
Participate in *Wonfel*	0.46	0.50	0.43	0.50	0.3777	0.44	0.50

Variable	Enrolled		Non-Enrolled		Mean differences p-value	Total	
	Mean	SD	Mean	SD		Mean	SD
or *Debo*							
Savings in bank account	0.16	0.37	0.12	0.33	0.0311	0.14	0.35
Outstanding loan	0.38	0.49	0.28	0.45	0.0006	0.32	0.47
Some one to rely on	0.40	0.49	0.37	0.48	0.2846	0.38	0.49
Official position held	0.29	0.46	0.19	0.39	0.0000	0.23	0.42
Supply side characteristics							
Travel time to health centre	70.00	46.94	64.07	43.37	0.0235	66.44	44.90
Travel time to public hospital	113.58	65.83	114.44	75.51	0.8373	114.10	71.77
Completed first degree (12+3)	0.45	0.50	0.46	0.50	0.6293	0.46	0.50
Received on the job training	0.81	0.39	0.83	0.38	0.4754	0.82	0.38
Availability of blood testing equipment	0.92	0.26	0.77	0.42	0.0000	0.83	0.37
Availability of urine testing equipment	0.94	0.24	0.88	0.33	0.0005	0.90	0.30
Waiting time to get patient card	10.56	10.06	14.60	12.59	0.0000	12.99	11.81
Waiting time to see a medical professional	28.33	23.97	38.48	29.42	0.0000	34.43	27.81
Perceived quality of care	0.65	0.48	0.40	0.49	0.0000	0.50	0.50
Community characteristics							
Region - Tigray	0.21	0.41	0.28	0.45	0.0042	0.25	0.43
Region - Amhara	0.30	0.46	0.21	0.41	0.0005	0.25	0.43
Region - Oromiya	0.27	0.45	0.24	0.42	0.1476	0.25	0.43
Region - SNNPR	0.22	0.41	0.27	0.44	0.0399	0.25	0.43
Travel time to all weather road	38.45	35.75	36.46	39.42	0.3718	37.25	37.99
Travel time to asphalt road	80.31	53.09	78.58	63.20	0.6193	79.27	59.35
Access to improved water	0.78	0.41	0.73	0.44	0.0369	0.75	0.43
Access to modern light	0.05	0.21	0.04	0.20	0.6892	0.04	0.21
Radio use	0.74	0.44	0.70	0.46	0.0696	0.72	0.45
Mobile phone use	0.42	0.49	0.39	0.49	0.3391	0.40	0.49

Variable	*Enrolled*		*Non-Enrolled*		*Mean differences p-value*	*Total*	
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*
Observations	489		735			1224	

4.5 Results

We estimate equation (1) using a logit model. To explore the sensitivity of the estimates to different ways of measuring health status we present four different sets of estimates. Marginal effect estimates, with standard errors clustered at the level of the primary sampling unit (the village), are provided in Table 4.4. Table 4.5 contains information on the main reasons for purchasing insurance.

Table 4.4
Probability of enrolment - marginal effects (std. error)

VARIABLES	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Socioeconomic status				
2nd consumption quintile (ref: poorest consumption quintile)	0.0185	0.0232	0.0208	0.0230
	(0.0518)	(0.0527)	(0.0519)	(0.0528)
3rd consumption quintile	0.0240	0.0332	0.0291	0.0324
	(0.0508)	(0.0522)	(0.0517)	(0.0525)
4th consumption quintile	0.0424	0.0420	0.0408	0.0397
	(0.0535)	(0.0533)	(0.0531)	(0.0537)
Richest consumption quintile	0.0748	0.0792	0.0774	0.0793
	(0.0681)	(0.0701)	(0.0692)	(0.0696)
HH head education- Informal (ref: no education at all)	0.0168	0.0136	0.0141	0.00984
	(0.0521)	(0.0516)	(0.0515)	(0.0515)
HH head education- Primary or above	0.0390	0.0412	0.0418	0.0365
	(0.0472)	(0.0474)	(0.0473)	(0.0475)
Participated in PSNP	0.328***	0.331***	0.331***	0.337***
	(0.0649)	(0.0654)	(0.0654)	(0.0647)
Demographic traits				
Male headed HH	0.0264	0.0311	0.0306	0.0316
	(0.0525)	(0.0500)	(0.0508)	(0.0501)
Age of HH head	0.000548	0.000430	0.000318	).000538
	(0.00184)	(0.00184)	(0.00183)	0.00186)
Household size	0.0223**	0.0214**	0.0217**	0.0199*
	(0.0107)	(0.0107)	(0.0106)	(0.0108)
Prop. of children aged under 6 (ref: Prop. of male aged 16 to 64)	-0.0940	-0.104	-0.102	-0.0694
	(0.177)	(0.176)	(0.176)	(0.178)
Prop. of male aged 6 to 15	-0.0192	-0.0168	-0.0158	0.00198
	(0.171)	(0.171)	(0.171)	(0.170)
Prop. of female aged 6 to 15	0.128	0.125	0.124	0.141
	(0.173)	(0.170)	(0.172)	(0.171)
Prop. of female aged 16 to 64	0.0511	0.0541	0.0590	0.0734
	(0.204)	(0.206)	(0.205)	(0.205)
Prop. of elderly aged above 64	-0.200	-0.173	-0.172	-0.163
	(0.177)	(0.170)	(0.171)	(0.176)

VARIABLES	*Model 1*	*Model 2*	*Model 3*	*Model 4*
HH head religion - Orthodox Christian (ref: Muslim)	0.144*	0.136*	0.136*	0.143*
	(0.0757)	(0.0761)	(0.0769)	(0.0768)
HH head religion – Protestant	0.106	0.0976	0.0935	0.100
	(0.104)	(0.105)	(0.105)	(0.106)
HH head religion - Other religion or no religion	-0.0686	-0.0781	-0.0825	-0.0577
	(0.135)	(0.131)	(0.132)	(0.136)
Health status and health care use				
Prop. of household members with fair SAH (ref: Prop. of household members with high SAH)	-0.0872	-0.0959	-0.0940	-0.106*
	(0.0602)	(0.0596)	(0.0601)	(0.0591)
Prop. of household members with low SAH	0.210	0.123	0.112	0.0927
	(0.138)	(0.136)	(0.130)	(0.131)
Past illness event	0.00143		0.000816	
	(0.00109)		(0.00103)	
Chronic illness	-0.0513**			
	(0.0222)			
Outpatient care use		0.0239		
		(0.0330)		
Inpatient care use		-0.0773	-0.0875	
		(0.0850)	(0.0818)	
Duration of hospitalization	-0.00166			
	(0.00458)			
Outpatient healthcare expenditure				).000246**
				(9.59e-05)
Inpatient healthcare expenditure				2.26e-05
				(2.36e-05)
Trust in modern care - Neither agree nor disagree (ref: Disagree)	-0.0267	-0.0337	-0.0304	-0.0261
	(0.0836)	(0.0822)	(0.0832)	(0.0821)
Trust in modern care - Agree	0.0867	0.0820	0.0827	0.0837

VARIABLES	*Model 1*	*Model 2*	*Model 3*	*Model 4*
	(0.0717)	(0.0729)	(0.0735)	(0.0728)
Formal and informal access to credit and social networks				
Member of *Iqqub*	0.0532	0.0614	0.0620	0.0689
	(0.0777)	(0.0764)	(0.0767)	(0.0760)
Member of credit & savings association	-0.00685	-0.0108	-0.0112	-0.00981
	(0.0690)	(0.0688)	(0.0686)	(0.0703)
Member of religious group	0.0277	0.0315	0.0336	0.0305
	(0.0404)	(0.0394)	(0.0392)	(0.0395)
Participate in *Wonfel* or *Debo*	0.0339	0.0335	0.0352	0.0370
	(0.0428)	(0.0427)	(0.0423)	(0.0434)
Savings in bank account	0.0503	0.0443	0.0464	0.0414
	(0.0621)	(0.0620)	(0.0624)	(0.0630)
Outstanding loan	0.0761	0.0794	0.0805	0.0811
	(0.0497)	(0.0492)	(0.0493)	(0.0498)
Someone to rely on	-0.0291	-0.0345	-0.0334	-0.0343
	(0.0287)	(0.0285)	(0.0286)	(0.0285)
Official position held	0.119***	0.117***	0.117***	0.110***
	(0.0432)	(0.0435)	(0.0433)	(0.0421)
Supply side characteristics				
Travel time to health centre	0.000807*	0.000857*'	0.000847*	).000834 *
	(0.000418)	(0.00042 1)	(0.0004 22)	(0.00042 8)
Travel time to public hospital	0.000167	0.00016 4	0.00016 5	).000207
	(0.000421)	(0.00042 6)	(0.0004 23)	(0.00042 3)
Completed first degree (12+3)	-0.105	-0.105	-0.104	-0.110
	(0.0749)	(0.0743)	(0.0752)	(0.0749)
Received on the job training	-0.0374	-0.0485	-0.0474	-0.0470
	(0.0925)	(0.0948)	(0.0944)	(0.0949)
Availability of blood testing equipment	0.304***	0.304***	0.307***	0.310***
	(0.0604)	(0.0608)	(0.0604)	(0.0607)
Availability of urine testing equipment	-0.120	-0.126	-0.128	-0.115
	(0.114)	(0.116)	(0.116)	(0.116)
Waiting time to get patient card	-0.00212	-0.00238	- 0.00236	-0.00252
	(0.00468)	(0.00465)	(0.0046 7)	0.00466)

VARIABLES	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Waiting time to see a medical professional	-0.00449**	-0.00462**	-0.00463**	-.00445**
	(0.00214)	(0.00215)	(0.00215)	0.00215)
Perceived quality of care	0.214***	0.212***	0.211***	0.209***
	(0.0633)	(0.0632)	(0.0636)	(0.0638)
Community characteristics				
Region – Tigray (ref: SNNPR)	0.00736	0.00647	0.00245	0.00716
	(0.126)	(0.125)	(0.126)	(0.126)
Region – Amhara	0.215*	0.211*	0.206*	0.213*
	(0.118)	(0.117)	(0.118)	(0.119)
Region – Oromiya	0.237**	0.238**	0.236*	0.246**
	(0.119)	(0.119)	(0.121)	(0.121)
Observations	1,180	1,182	1,182	1,182
Pseudo R-squared	0.1900	0.1884	0.1885	0.1925
Log pseudo likelihood	-643.878	-646.332	-646.297	-643.083

Notes: Outcome variable is CBHI enrolment status in 2012 and all explanatory variables are at their baseline (2011) values; clustered standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Unlike the bulk of the existing papers on enrolment in CBHI which find that the lowest-income groups are often excluded from the scheme, uptake of the Ethiopian CBHI program reveals the opposite, with the poorest quintile providing the largest share of CBHI beneficiaries (Table 4.3). The logit estimates suggest that this inclusion of the poorest is partly driven by participation in the productive safety net programme (PSNP), which targets chronically food insecure households and is associated with a 33 to 34 percentage point increase in CBHI enrolment.[19] Conditional on PSNP participation, the educational status of the household head and the consumption quintile in which a household falls have no statistically significant bearing on enrolment. The relative pro-poor character of the CBHI uptake may in part also be attributed to the targeted subsidy provided to indigent households. As shown in Table 4.2, about 20 percent (8.9/45.5) of enrolled households in December 2012 were receiving a fee waiver.

Table 4.5
Single most important reason for (not) enrolling and intention to alter insurance status

Insured households (N = 489)	*N (%)*	Uninsured households (N = 735)	*N (%)*
Reasons for enrolment (percent of insured households)		Reasons for not enrolling in CBHI (percent of uninsured but eligible households)	
Illness and/or injury occurs frequently in the household	39 (8.1)	Illness and injury does not occur frequently in the household	31 (5.2)
Pregnant women in the household need health care services	34 (7.0)	The registration fee and premiums are not affordable	203 (34.2)
Child/children in the households need health care services	37 (7.7)	Want to wait in order to confirm the benefit	117 (19.7)
To finance health care expenses	152 (31.5)	Lack of awareness about the scheme	133 (22.4)
The household is exempt from registration fee and premium	22 (4.6)	Shortage of money	32 (5.4)
Premium is low compared to user fee	120 (24.8)	Limited availability of health services	13 (2.2)
Pressure from CBHI officials	50 (10.4)	Quality of health care services is low	17 (2.9)
Other reasons	29 (6.0)	Other reasons	47 (7.9)
Insured households who plan to renew their CBHI membership	466 (96.1)	Uninsured households who plan to enrol in the future	404 (57.1)

The qualitative information gathered through the key informant interviews and via observations in the field suggests two reasons for the remarkably large effect of PSNP participation. First, government officials have been taking measures to integrate different development interventions such as agricultural extension, education and health programmes. Households covered by the PSNP are provided information on the health insurance scheme and encouraged to enrol. This is illustrated by a statement made by a key informant in Tigray region,

> Continuous education on health issues including about the recently introduced community based health insurance scheme is provided to those people who are covered under PSNP. Moreover, during the distribution of PSNP payments, the participants are asked if they would like to register for CBHI and those who volunteer pay immediately and join [Interviewed on December 07, 2012].

Second, while the pro-poor tilt of the scheme is a positive aspect it is possible that the enrolment of PSNP beneficiaries may not be entirely voluntary. Village level CBHI officials may exert pressure and force households to enrol. Our data show that about 10 percent (50 out of 489) of insured households indicate that their main reason for joining the scheme is pressure from CBHI officials (Table 4.5). In relation to this, an uninsured FGD participant in Oromiya region said,

> A *kebele* (village) official reduced my monthly income from PSNP and informed me that the reduced money was for CBHI membership contribution. I said I did not want to enrol in the scheme and asked him to give me my full PSNP benefit. However, he did not pay me. So, I accused him to a higher *kebele* official and I got my money back [Discussed on December 23, 2013].

The gender and age distribution of household members may affect CBHI uptake. For instance, households with more children, a greater proportion of elderly household members or adult females in the reproductive age group may be more likely to demand health insurance and health care. Some evidence of this is available in Table 4.5. However, apart from household size, which is associated with a 2 percentage point increase in the probability of enrolment there is no statistically significant relationship between household composition and scheme enrolment. In three of the four regions (Tigray, Oromiya and SNNPR) the insurance contribution is fixed per household and hence the scheme may be especially attractive for households with a large family size. Orthodox Christians are about 14 percentage points more likely to join the scheme as compared to other religions. The reasons for this are not entirely clear.

There is no evidence that poor self-assessed health status has a bearing on enrolment. Similarly, illnesses, incidence of chronic diseases, duration of hospitalization and utilization of care (outpatient and inpatient) are not positively linked to CBHI uptake. In fact, there is a negative link

between enrolment and chronic disease. While pre-existing medical conditions and utilization may not induce uptake it does seem that recent episodes of health care spending on outpatient care prompt enrolment – a half a standard deviation increase, about 100 ETB, in outpatient expenditure is associated with a 2.5 percentage point increase in enrolment. Nevertheless, only about 8 percent of insured households reported that they joined the scheme because of frequent illnesses in their households (see Table 4.5). The existing papers, of which six out of nine find evidence of adverse selection, tend to use the incidence of illness as their selection measure. If we were to use a similar measure then we would conclude that adverse selection is unlikely to be major concern in the current scheme. While it is hard to make a definitive claim, perhaps a key reason for the lack of selection effects is that, in order to discourage enrolment on the basis of pre-existing medical conditions, enrolment is permitted only at the household and not at the individual level and new members have to wait for at least one month before they can use their CBHI card to access healthcare.[20]

Access to formal and informal sources of credit and membership in social networks may have a positive or a negative effect on demand for health insurance. On the one hand, belonging to a network may reduce the incentive to participate in the CBHI scheme while at the same time such networks may be sources of finance to purchase insurance and may also help enhance understanding of health insurance. The key informant interviews and the focus group discussions revealed that various social networks such as *Iddir* (funeral association), *Iqqub* and religious groups were used to raise understanding of CBHI and to persuade households to join the scheme. However, except for the variable which indicates that a household member holds or held an official government position, none of the credit or network related variables have a bearing on enrolment. Holding or ever having held an administrative or community leadership position enhances CBHI enrolment by about 11-12 percentage points. This is perhaps not surprising. The qualitative data collection efforts show that in all regions, *kebele* officials and community leaders were provided information and understanding of the scheme and were expected to inform their constituencies and help generate interest in the scheme.

Turning to supply side factors, contrary to expectations, there is a positive association between travel time to health centres and CBHI

membership. A one standard deviation increase (about 45 minutes) in travel time increases enrolment by 3.6 percentage points. Travel time to public hospitals does not have a bearing on CBHI uptake. While unexpected the positive link between distance and enrolment may be driven by the higher costs (transportation and health care related) of accessing health care for households living in areas far from the health centres which may provide a stronger incentive to enrol. There is a clear and discernible link between the quality of care on offer and CBHI uptake. For instance, availability of blood testing equipment in the closest health facility increases the probability of CBHI enrolment by 31 percentage points. Average waiting time to see a health care professional, a measure of quality in its own right and a proxy for facility staffing levels, exerts a negative effect on enrolment. A one standard deviation reduction in waiting time (28 minutes) is associated with a 12 percentage point increase in enrolment.

The importance of the quality of care in determining insurance uptake and use of services also emerged from the focus group discussions. Both insured and uninsured FGD participants from all regions criticized the quality of available services and indicated that even if public health facilities were relatively accessible in terms of distance as compared to private facilities, a number of them did not have the necessary laboratory equipment and medicines. In relation to this, an insured FGD participant in Amhara region shared her experience,

> I went to private providers and incurred OOP health care expenditure even if I am a CBHI member. The health centre in our village did not have laboratory equipment and the health workers could not examine my real health problem. [Discussed on January 11, 2013].

An additional issue which we cannot control for in our estimates but was revealed by the qualitative information is the reported behaviour and attitude of medical providers to those who have insurance. For instance, an insured FGD participant in SNNPR explained,

> The health professionals do not provide equal services and respect for both insured and uninsured patients. They give medicine only for non-

> members of the scheme and they tell members of the scheme to buy from private stores and we are forced to buy drugs from our pockets even if we have health insurance cards [Discussed on January 24, 2013].

Similarly, uninsured FGD participants in Oromiya region believed,

> The doctors give priority to those patients who pay in cash during services provision and insured people do not get quick services. Moreover, they do not want to properly treat insured patients and think that most insured people come to health facility just for check up for minor medical cases since CBHI members do not pay cash during services utilization [Discussed on December 25, 2013].

Based on the FGD the two reasons for the preferential treatment meted out to uninsured patients is their immediate contribution to the revenues of the health facilities and their apparent overuse of health care facilities. Doctors/facilities may also prefer to treat the uninsured due to the paper work required to receive payments for insured patients and the payment lag.[21]

Households in Amhara and Oromiya regions are about 20 to 25 percentage points more likely to enrol as compared to households living in Tigray and SNNPR. A possible reason behind the lower CBHI participation in SNNPR region, at least initially, could be the relative difference in the design characteristics of the schemes. Unlike the three pilot sites, CBHI members in SNNPR have limited access to tertiary health care services. Insured households in this region may only use tertiary services at the nearest public hospital (while those in Amhara may visit any public hospital within the region and those in Oromiya may use care from public hospitals within and outside the region). Similarly, unlike the other three regions, insured households in SNNPR cannot claim reimbursements if they use health care services from private providers in the event that medical equipment or drugs are not available in CBHI linked facilities. In addition, SNNPR is a relatively poorer province (see Table A4.2, consumption quintiles) and the lower uptake may also reflect a lower capacity to pay for health insurance. Despite low uptake in April 2012 potentially due to the reasons discussed above, by December 2012 enrolment in the region had caught up with the leading region in the coun-

try. In the case of Tigray, while the features of the insurance package do not differ as compared to other regions it lacks behind in terms of the quality of care and records the longest waiting times across regions and is also not particularly well-resourced in terms of equipment (see Table A4.2).

4.6 Conclusions

This paper used data from longitudinal household surveys, a health facility survey and qualitative information obtained through focus group discussions and key informant interviews to analyse the factors that determine insurance uptake in a pilot CBHI scheme introduced by the Ethiopian government in June 2011. The paper focused on three issues – whether the scheme is socially inclusive, whether uptake is more likely amongst households with specific health care status and health needs and the role of the quality of health care in influencing uptake.

We found that by December 2012, a year and a half since being introduced, scheme uptake had reached an impressive 45.5 percent of target households. This is remarkable as compared to the experiences of other Sub-Saharan African countries which have introduced similar schemes. With regard to social inclusion, unlike the bulk of the literature which finds that the lowest income groups are often excluded from such schemes we found that the CBHI scheme may be characterised as pro-poor. However, there was no evidence that socioeconomic status as measured by consumption quintiles and education of the household head directly influences enrolment. Rather, we found that food insecure households who have participated or still participate in the productive safety net programme (PSNP) are far more likely (33 percentage points) to join the pilot scheme. The inclusive nature of the scheme may be attributed to the government's targeted subsidy program while the PSNP effect may be attributed to two reasons. On a positive note the KII and the FGD revealed that the government is making efforts to integrate various development interventions and recipients of one government program are far more likely to be informed about other government programs which in turn encourages uptake. On a relatively negative note we also found evidence of officials coercing PSNP beneficiaries to join the scheme. About 10 percent of insured households indicated that they had

been pressurized into joining the scheme. Self-assessed health status and past illnesses and symptoms are not positively correlated with uptake and about 8 percent of insured households indicated that the main reason for enrolling in the scheme is that household members are frequently ill. Given these figures it is unlikely that adverse selection will seriously afflict the scheme. An explanation for this may be the scheme design which was explicitly designed to mitigate adverse selection by permitting enrolment only at the household level.

A relatively novel contribution of the paper is our examination of the role of the quality of care on uptake. The availability of medical equipment and waiting time to see a medical professional, played a large role in determining enrolment. For instance, the availability of blood testing equipment at the nearest health centre was associated with a 30 percentage point increase in enrolment while a one standard deviation reduction in waiting time was associated with a 12 percentage point increase in uptake. During the FGD both insured and non-insured groups criticised the shortage of medical equipment, lack of drugs and also pointed out that health providers favoured uninsured patients versus the insured. The proximate reasons for this appear to be the immediate payments provided by the uninsured and the administrative burden associated with obtaining payments for providing services to the insured.

The start of the pilot scheme has been impressive and despite coercion in some cases and criticisms about the quality of care, a clear signal of the benefits emanating from the scheme is that almost all insured households (96 percent) indicate that they will renew their membership (see Table 4.5). At the same time about 57 percent of uninsured households state that they plan to enrol in the future. While this augurs well as the government plans to spread the scheme to an additional 161 districts which fulfil the same selection criteria as the 12 pilot districts, the results presented here suggest that expanding uptake will need continued investments in the quality of care and attempts to alter the differential treatment received by the insured.

Notes

[1] This paper has appeared as Institute of Social Studies Working Paper No. 578 (2013). It is co-authored with Robert Sparrow, Zelalem Yilma, Getnet Alemu,

Arjun S. Bedi. The manuscript benefited from useful comments and suggestions from conference/workshop participants at an International Conference organized by the Courant Research Centre on Poverty, Equity, and Growth in Developing and Transition Countries, University of Göttingen, Germany, July 2014; an International workshop on Health Shocks and Community Based Health Insurance in Rural Ethiopia, Addis Ababa, Ethiopia, February 2014; and the fifth Amhara Region Economic Development Conference, Bahir Dar, Ethiopia, August 2013.

[2] Mebratie et al. (2013) report that of the fourteen papers which examine social exclusion in CBHI uptake using regression methods, only two studies are based on longitudinal data sets canvassed before and after the intervention. The remainder are cross-section studies based on post-intervention data. Similarly, only three out of nine that papers that have examined adverse selection rely on longitudinal data.

[3] The initial plan was to roll out the pilot scheme in 3 districts in each of the four regions. However, an additional district in Oromiya region volunteered to join the pilot scheme and was included. Together, these four main regions account for about 86 percent of the country's population (Population Census Commission, 2008).

[4] The complete set of selection criteria included (1) Willingness of district authorities to implement the schemes (2) Commitment of districts to support schemes, (3) Geographical accessibility of health centres (4) Quality of health centres, (5) The implementation of cost recovery, local revenue retention, and public pharmacy policies in health centres.

[5] In their review of the CBHI literature, Mebratie et al. (2013) classify the 48 schemes covered in the studies they review into three distinct scheme types. Sixteen are community prepayment health organizations, 7 are health care provider initiated insurance schemes, and 25 are classified as government run community involved health insurance schemes. The Ethiopian CBHI scheme falls in the last category.

[6] According to information obtained from a key informant at Abt Associates, no village voted against the scheme and the programme rolled out in all villages in the pilot districts.

[7] Core household members include a mother, father, and their children below age 18.

[8] This figure is based on an annual per capita income of USD 370 in 2011, an exchange rate of ETB 18 to USD 1 and a household of 6 core members.

[9] Indigent groups are defined as those households who do not have land, a house, or any valuable assets. According to information obtained from Abt Associates, the coverage of the indigent groups depends on the budget allocated by district and regional governments. In December 2012, the share of indigent groups as a proportion of the total eligible households (300,605 households) ranged from a low of 0.9 percent in Deder district in Oromiya to 21.1 percent in South Achefer district in Amhara region. Nation-wide, by December 2012, 8.9 percent of total eligible households had received a fee-waiver.

[10] The qualitative survey shows that the participation of the community in the decision making process of the scheme is limited. Only two CBHI members were actually selected as part of the village management and there were no regular meetings with the community to update members about the activities of the scheme and collect feedback.

[11] In each of the four regions there are three CBHI districts and one control district.

[12] In total, the second round of the survey covered 1,599 (2% attrition) households that had been canvassed in the first round.

[13] On average about 41 households were matched to one health centre.

[14] The productive safety net programme (PSNP) is a government social security programme designed to support chronically food insecure households. Participants engage in public works (road and school construction, soil and water conservation) and receive payments in cash or food.

[15] Since we are interested in identifying the separate effect of health care expenditure the consumption measure used here is net of health care expenditure.

[16] *Iqqub* is a rotating credit and savings association.

[17] *Wonfel* & *Debo* are traditional associations involving informal labour sharing arrangements in agricultural activities.

[18] 'Perceived quality of health care services' is based on eliciting the view of the head of the health facility survey on the overall quality of health care services provided by the facility. The specific question was, in general, do you think that this health centre is providing the expected standard of health care services, yes or no.

[19] A majority (55 percent) of the PSNP beneficiaries fall in the bottom two quintiles of the consumption distribution.

[20] All six of the papers/schemes which find evidence of adverse selection permit enrolment at an individual level.

[21] Health facilities are expected to submit claims on a quarterly basis. To be reimbursed, health facilities need to submit a claim based on a specific format and

submit it to the district CBHI offices. Photocopies of the signatures of CBHI members who used health care services also need to be attached. The district CBHI offices are supposed to pay 75 percent of the claims within three days of receipt of the forms by checks/bank transfer without any investigation. Prior to paying out the remainder, a medical audit is expected to be conducted. Once approved, the rest of the claims are paid out.

5 The impact of Ethiopia's pilot community based health insurance scheme on healthcare utilization and cost of care[1]

Abstract

This paper assesses the impact of the Ethiopian pilot Community Based Health Insurance scheme on utilization of modern health care and the cost of accessing health care. It adds to the relatively small body of work that provides a rigorous evaluation of CBHI schemes. We find that enrolment leads to a 30 to 41 percent increase in utilization of outpatient care at public facilities, a 45 to 64 percent increase in the frequency of visits to public facilities and at least a 56 percent decline in the cost per visit to public facilities. The effects of the scheme on out-of-pocket spending are not as clear. The impact on utilization and costs combined with a high uptake rate of almost 50 percent within two years of scheme establishment, suggests that this scheme has the potential to meet the goal of universal access to health care.

5.1 Introduction

Community Based Health Insurance (CBHI) schemes, which typically cater to workers in the informal and rural sectors, have been established in a number of developing countries. These schemes, which involve the target population in scheme design and management, aim to expand access to modern health care services and provide financial protection.[2] As is described in chapter four, the Government of Ethiopia introduced a pilot Community Based Health Insurance scheme in June 2011. The aim

of this chapter is to examine the effect of the scheme on access to health care, the cost of accessing care, and household out-of-pocket (OOP) health expenditures.

While there is no dearth of CBHI schemes and indeed evaluations which examine the impact of such schemes on utilization of healthcare, financial protection, resource mobilization and social exclusion, the quality of the existing evidence has been questioned. Existing reviews of this body of work have been conducted by Jakab and Krishnan (2001), Preker et al. (2002), Ekman (2004) and Mebratie et al. (2013). Based on 45 published and unpublished works, Jakab and Krishnan (2001) conclude that there is convincing evidence that community health financing schemes are able to mobilize resources to finance healthcare needs, albeit with substantial variation across schemes. They also argue that the schemes are effective in terms of reaching low-income groups although the ultra-poor are often excluded. Preker et al. (2002), reach a similar conclusion and point out that there is strong evidence that CBHIs are successful at enabling access to health care for the poor and providing financial protection. As opposed to these two narrative reviews, based on a systematic review of 36 studies conducted between 1980 and 2002, Ekman (2004) finds that while CBHI schemes do provide financial protection for low income groups, the magnitude of the effect is small. In addition, Ekman (2004) concludes that the evidence base to develop stylized facts is questionable and only five studies included in his review may be considered of high-quality.[3] These studies are labelled high-quality studies primarily as they attempt to use econometric methods, albeit on cross-section data, to identify the effect of CBHI on various outcomes.

The updated systematic review presented in chapter two shows that 74% of the studies carried out in low and middle-income countries report a positive and statistically significant impact of CBHI on healthcare utilization. The schemes are found to be more effective in extending access to relatively cheaper outpatient care as compared to expensive inpatient care. Turning to financial protection, 16 studies examined the impact of the schemes on out-of-pocket (OOP) payments, of which 44% conclude that the schemes are not associated with a reduction in out-of-pocket (OOP) healthcare expenditure. Methodologically, a critical comparison of the sets of studies reviewed by Ekman (2004) and the current study shows that while there is a clear increase in the quality of the empirical data base, some concerns remain, especially if the aim is to identi-

fy the causal impacts of CBHI schemes. The key concern is that since CBHI enrolment is often a voluntary choice, and may be more likely to attract individuals with existing medical conditions and/or relatively wealthy households. However, except for a handful of papers, the bulk of the CBHI evaluation literature is based on cross-section data and does not account for such selection effects.[4] Working with cross-section data and ignoring self-selection is likely to lead to unreliable estimates of the effect of such schemes.

This paper evaluates the impact of Ethiopia's pilot community based health insurance scheme on utilization of modern healthcare, financial protection and the cost of care by giving due emphasis to the methodological issue raised above. The analysis relies on a three-period panel data, which is augmented by a health facility survey and qualitative data obtained from key informants and focus group discussions. The longitudinal household data were canvassed before (one wave) and after the intervention (two waves) from both pilot and non-pilot districts. The available data base allows us to construct different treatment and control groups (within and across the pilot and non-pilot districts), control for self-selection driven by observable and unobservable time-invariant factors and to deploy a range of impact evaluation methods to identify causal effects.

The rest of the paper is structured as follows. The next section describes the data. Section 3 discusses the research methods. Section 4 contains estimates, while the final section provides a discussion and brings the paper to a close.

5.2 Data description

The paper is based primarily on three-rounds of a household level panel data set from rural Ethiopia. The first round of the survey was collected between March and April 2011, a few months before the roll out of the CBHI scheme, while the second round took place a year later during March and April 2012 and the third round in March and April 2013.

As it is described in chapters three and four, the household surveys cover 12 pilot and 4 non-pilot CBHI districts. The baseline survey used in this study includes 1,632 households comprising 9,455 individuals. The second round of the survey covered 1,599 households and the third round of data resurveyed 1,583 (3% attrition) of the households that had

been canvassed in the first round. The data show scheme uptake was 41% in April 2012 and reached 48% in April 2013.[5] 82% of insured households renewed their subscriptions, and 25% of those who had not enrolled in the first year, did eventually join the scheme a year later.

In addition to an extensive module on household and individual health conditions, the second and third rounds of the survey enquired whether households had enrolled in the CBHI and they also contain extensive modules on understanding of insurance and knowledge of experience with the CBHI scheme.

In order to assess and potentially control for the quality of health care and to gain a clearer understanding of scheme design, operation and implementation issues, this study use health facility survey and qualitative information that are described in the previous chapters.

5.3 Empirical framework

Our aim is to identify the impact of the CBHI scheme on health care utilization, cost of care and out-of-pocket expenditure. There are two channels through which the CBHI scheme may promote greater use of health care. Prior to being offered insurance, households in the pilot districts were provided information on the insurance scheme and also on the availability of health care services, and the importance of using such services when needed. This new information (indirect channel) combined with anticipated reductions in the cost of care (direct channel) may be expected to promote greater use of modern outpatient and inpatient care.

With regard to outpatient care, we begin by considering the effect of the scheme on the probability of using modern care. This is followed by an examination of the effect of the scheme on the use of public and private modern care. It is possible that insurance leads to a substitution from private to public care but there may also be an increase in the use of private care, since such care is subsidized in case public facilities cannot offer the required services. For scheme enrolees, access to tertiary level care, at least if reimbursement is desired, is contingent on being referred by health centres. Through this requirement the scheme may also have a bearing on the source of care and enrolled households may be more likely to visit health centres as opposed to hospitals. To examine this possibility we consider the impact of the scheme on the probability

of using different sources of care (health post, health centres, hospitals). In addition, we also examine scheme effect on the intensity of health care usage (number of visits to a health facility per household member). While we do consider the effect of the scheme on inpatient care, our efforts are impeded by the limited use of such care during the time period under scrutiny.

With regard to financial protection, we examine the effect of the scheme on out-of-pocket health-related expenditure and the probability that households experience catastrophic health expenditures, which we define as amounting to at least 5 or 10% of their total household expenditure. Since the scheme covers only spending on healthcare, we examine its effect on medical costs (consultation and medicine) and ancillary costs (transport and others) separately.

The voluntary nature of CBHI enrolment is the key concern for identifying the effect of the scheme. Enrolment may be driven by unobserved household characteristics that are systematically associated with the outcomes, and thereby confound the estimates of the effect of the scheme. For example, latent health conditions or income can influence the demand for health care as well as the demand for health insurance. Ignoring this would lead to biased estimates, although the direction of the bias is a priori unknown and depends on the source.

To control for observed and unobserved traits that do not change over time but which may have a bearing on scheme enrolment, we exploit the longitudinal nature of the data at hand and estimate a household fixed-effect model,

$$y_{it} = \alpha + CBHI_{it}\beta + T_t\varphi + \upsilon_i + \varepsilon_{it}, \quad (1)$$

where, y_{it} indicates the outcome of interest for household *i* at time *t*. *T* indicates the time period of the observation- that is two dummy variables one each for 2012 and 2013, $CBHI_{it}$ indicates whether household *i* is enrolled in the scheme in year *t*, β is the treatment effect, υ_i is a household fixed effect and ε_{it} is a time-variant error term. To control for time-variant observable factors that may affect the outcomes we also include in (2) a range of time varying household and community level covariates (X_{it})[6]

$$y_{it} = \alpha + CBHI_{it}\beta + X_{it}\varphi \quad + T_t\phi + \upsilon_i + \varepsilon_{it}. \tag{2}$$

Finally, we use propensity score matching (nearest neighbour matching) and subsequently estimate equation (2) using only treated and controls that are on support. Among other variables, the propensity score specification includes baseline values of self-assessed health status, illness experience, and the quality of care.[7]

We have two potential control groups – uninsured households in the pilot districts and uninsured households in the non-pilot districts. Since enrolment is voluntary, there is a risk of selection on unobservables in pilot districts. Furthermore, since all households in the pilot districts have been provided information on the scheme and the importance of using modern health services it is possible that the scheme influences outcomes even for those who do not enrol (spill over effects). To guard against this possibility we use an alternative control group – households from non-pilot districts. But while estimates based on comparing the treated with control households from such districts are unlikely to be contaminated by spill over effects there are other concerns. Although, drawn from the same region and based on the same criteria used to identify the pilot districts, households residing in pilot versus non-pilot districts may differ in terms of their observed and unobserved traits and may also be subject to different risks and shocks over time, which should be less of a concern for households residing in the same district. We estimate all three empirical models outlined above for both control groups, which serves as a robustness check and also allows us to gauge the parallel trends assumption.

To elaborate, the key identifying assumption is the 'parallel trends' assumption which requires that the outcome for both treated and control groups follows the same trend in the absence of the insurance scheme. Since we only have one observation before the scheme we cannot directly examine what would have happened to the treated group in the absence of insurance. Alternatively, in order to gauge the parallel tends assumption, we look at the effect of the scheme on outcomes which are not expected to be influenced by the programme and check the robustness of the results using alternative control groups. If the identifying assumption holds then there should be similar trends in the outcomes for

the two uninsured groups, and we would expect the impact estimates to be robust to the choice of control group.

5.4 Results

5.4.1 Who enrols?

Given the voluntary nature of the scheme, a key concern is whether scheme participants and non-participants are similar with regard to traits that may influence both uptake and outcome. Descriptive statistics for insured and uninsured households, both in districts where the scheme was offered and not offered display significant difference between treated and control groups in observable characteristics such as socioeconomic status, health status, household size, and supply side characteristics There is greater similarity between households located in the same district as compared to those in a different district.[8] Larger households with more educated household heads, belonging to the poorest quintiles and those with a good self-reported heath status are more likely to enrol. Quality of care is found to be an important factor in determining enrolment.

However, when we include all these variables as controls in a logit model of the probability that households in the CBHI districts join the scheme, we find that health status and household socio-economic status do not have a bearing on enrolment and that the key factors determining enrolment are participation in productive safety net programme, quality of health care services and regional fixed-effects.[9] The lack of evidence from the enrolment regression that wealthier or less healthy households are more likely to join the scheme, allay concerns about household selection effects confounding the impact estimates. At the same time, in addition to controlling for fixed effects, the estimates highlight the need to control for differences in access to better quality health care as such access may lead to greater health care usage regardless of CBHI enrolment.

5.4.2 Health care utilization

Trends in outpatient health care utilization by CBHI status are provided in Table 5.1. In 2011, the share of insured and non-insured households in pilot districts using outpatient care from modern providers is similar (38 percent for insured and 39 percent for uninsured).[10] Once CBHI was

introduced, the utilization of outpatient care shows a slight increase for the insured while it declines for non-insured households In CBHI control districts utilization is more stable. The same pattern holds for use of care from public providers. The use of private care shows a decrease from 2011 to 2013 for the treatment and control groups. In terms of health care by source, the share of households using outpatient care from health centres increases by 10 percentage points (from 20% in 2011 to 30% in 2013) for the insured while there is a slight decline for the two control groups. The insured also seem to be using public health facilities more intensively. For instance, the number of outpatient visits per insured household member increases from 0.11 visits in 2011 to 0.14 visits in 2013 while for uninsured households in the pilot districts the corresponding numbers are 0.12 visits in 2011 and 0.07 visits in 2013.

Table 5.1
Outpatient care utilization by CBHI membership status (balanced panel)

Outcome variable	CBHI pilot districts						Non-CBHI pilot districts (N=384)		
	Insured households (N= 569)			Uninsured households (N= 616)					
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Use of health care									
Share of households using outpatient care from modern providers	0.38	0.41	0.40	0.39	0.31	0.29	0.32	0.30	0.32
Share of households using outpatient care from public providers	0.27	0.32	0.35	0.29	0.23	0.22	0.23	0.22	0.20
Share of households using outpatient care from private providers (clinic)	0.10	0.12	0.7	0.11	0.09	0.08	0.12	0.14	0.10
Use of health care, by source									
Share of households using outpatient care from a health post (public)	0.03	0.02	0.02	0.03	0.03	0.01	0.02	0.01	0.01
Share of households using outpatient care from health centres (public)	0.20	0.26	0.30	0.20	0.16	0.17	0.17	0.14	0.15
The share of households used outpatient care from public hospital	0.06	0.03	0.03	0.05	0.03	0.03	0.02	0.02	0.04
Intensity of use									
No. of outpatient visits per hh. member to modern facility	0.15	0.18	0.15	0.16	0.12	0.10	0.14	0.12	0.11
No. of outpatient visits per hh. member to public facility	0.11	0.15	0.14	0.12	0.09	0.07	0.10	0.08	0.07
No. of outpatient visits per hh. member to private facility	0.04	0.04	0.02	0.05	0.03	0.03	0.04	0.05	0.03

Notes: In 2011, a household is categorized under insured group if the household was insured in 2012 or in 2013. Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. The figures refer to the use of outpatient care in the two months preceding the survey.

Estimates of the effect of the CBHI scheme on outpatient care utilization, utilization by source and the intensity of use are provided in Tables 5.4, 5.5 and 5.6, respectively.[11] Estimates are provided for each of the control groups and using the three methods outlined in section 3. Based on the estimates reported in columns 4 to 6 of Table 5.2, access to CBHI is associated with a 6 to 11 percentage point increase in the use of modern health care. The point estimate is larger (11 percentage point increase) when households within the pilot districts are used as a control group as compared to households located in the non-pilot districts (6 percentage point increase). The effect emanates mainly from an increase in the probability of using public providers. The 8 to 11 percentage point increase in the use of public providers translates into a 30 to 41% increase relative to baseline values[12]. There is no statistically significant increase in the use of care from private providers. This is not unexpected, as typically, the scheme does not cover care provided by private clinics. Estimates are not sensitive to the estimation approach.[13]

Table 5.2
The impact of CBHI on the probability of outpatient care utilization

Outcome variable	*Fixed effects without covariates*			*Fixed effects with time varying covariates*			*Fixed effects after matching* [a]		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Share of households using outpatient care from modern providers	0.101***	0.0600**	0.0797***	0.107***	0.0580*	0.0787***	0.104***	0.0490	0.0752***
	(0.0302)	(0.0295)	(0.0280)	(0.0305)	(0.0310)	(0.0284)	(0.0303)	(0.0373)	(0.0281)
Share of households using outpatient care from public providers	0.108***	0.0856***	0.0985***	0.114***	0.0821***	0.0983***	0.110***	0.0845**	0.0935***
	(0.0271)	(0.0274)	(0.0256)	(0.0275)	(0.0284)	(0.0259)	(0.0274)	(0.0338)	(0.0255)
Share of households using outpatient care from private providers	0.0243	0.00999	0.0172	0.0233	0.00839	0.0149	0.0205	0.0251	0.0138
	(0.0208)	(0.0233)	(0.0198)	(0.0225)	(0.0256)	(0.0217)	(0.0224)	(0.0329)	(0.0220)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	3,265	1,906	4,146

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is equal to one if at least one household member has used outpatient care in the two months preceding the survey; [a] Nearest neighbour matching was used to create a sample of treated and matched controls.

As shown in Table 5.3, the entire increase in the probability of using publicly provided care comes from increased use of health centres. Focusing on estimates in columns 4 to 6 we see that the scheme is associated with a 10 to 11 percentage point increase in the probability of using health centres and a 1 to 3 percentage point reduction in the probability of using public hospitals, although not always statistically significant. The pattern of increased use of health centres combined with a decline in the use of hospitals is consistent with the scheme design which creates incentives for patients to visit health centres before they try to access higher level care.

Table 5.3
The impact of CBHI on the probability of outpatient care utilization by source

Outcome variable	*Fixed effects without covariates*			*Fixed effects with time varying covariates*			*Fixed effects after matching* [a]		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Share of households using outpatient care from a health post	0.0102	0.0102	0.00968	0.00648	0.00909	0.00767	0.00387	0.00880	0.00601
	(0.0104)	(0.0115)	(0.00975)	(0.0110)	(0.0123)	(0.0102)	(0.0117)	(0.0118)	(0.0106)
Share of households using outpatient care from a health centre	0.109***	0.105***	0.108***	0.110***	0.0995***	0.106***	0.104***	0.0897***	0.101***
	(0.0220)	(0.0237)	(0.0213)	(0.0212)	(0.0234)	(0.0206)	(0.0216)	(0.0300)	(0.0201)
Share of households using outpatient care from a public hospital	-0.0178	-0.0324***	-0.0239**	-0.0117	-0.0310***	-0.0220*	-0.00688	-0.0241*	-0.0209*
	(0.0120)	(0.0106)	(0.0107)	(0.0124)	(0.0113)	(0.0111)	(0.0129)	(0.0128)	(0.0116)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	3,265	1,906	4,146

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is equal to one if at least one household member has used outpatient care in the two months preceding the survey; [a] Nearest neighbour matching was used to create a sample of treated and matched controls.

Not only does the scheme increase the probability of using care, it also leads to an increase in the frequency of visits to health care providers. Table 5.4, columns 4 to 6, shows that in the 2 months preceding the survey, scheme participation leads to an increase in the number of outpatient visits per household member to a public facility by about 0.05 to 0.07. This is a 45 to 64% increase in the frequency of health care use, relative to the baseline (0.11 visits). The results are again robust to the estimation approach and choice of control group. To appreciate this effect, consider that on an annual basis for a 6 person household these effects translate into an additional 2 (0.05*6*6) to 3 (0.07*6*6) visits per household per year as compared to households who are not enrolled.

Table 5.4
The impact of CBHI on the intensity of outpatient care utilization

Outcome variable	*Fixed effects without covariates*			*Fixed effects with time varying covariates*			*Fixed effects after matching* [a]		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
No. of outpatient visits per hh. member to modern facility	0.0620***	0.0436**	0.0554***	0.0624***	0.0376*	0.0516***	0.0631***	0.0585**	0.0525***
	(0.0217)	(0.0194)	(0.0181)	(0.0231)	(0.0209)	(0.0191)	(0.0237)	(0.0260)	(0.0197)
No. of outpatient visits per hh. member to public facility	0.0628***	0.0542***	0.0589***	0.0675***	0.0535***	0.0595***	0.0676***	0.0594**	0.0594***
	(0.0165)	(0.0160)	(0.0149)	(0.0170)	(0.0157)	(0.0150)	(0.0177)	(0.0251)	(0.0156)
No. of outpatient visits per hh. member to private facility	0.0160	0.00452	0.00938	0.0140	0.000386	0.00639	0.0150	0.00522	0.00801
	(0.0113)	(0.0110)	(0.0101)	(0.0125)	(0.0133)	(0.0116)	(0.0126)	(0.0165)	(0.0118)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	3,265	1,906	4,146

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is number of outpatient visits per household member in the two months preceding the survey; [a] Nearest neighbour matching was used to create a sample of treated and matched controls.

We did estimate the same models for inpatient care but the coefficients for CBHI participation are essentially zero, regardless of method and control group.[14] Immediate and more frequent utilization of primary health care services could reduce the chance to suffer from severe health problems and this could also reduce the need for hospitalization care. However, the use of inpatient care in the 12 months preceding each survey is below 5% and we suspect that there is insufficient variation to identify precise treatment effects.

5.4.3 Health care spending

Descriptive statistics for expenditure on health care for each of the three years and conditional on insurance status are provided in Table 5.5, with estimates of the impact of the program on outpatient health care spending in Table 5.6.[15] Since the scheme covers only direct medical costs for consultation and drugs but not indirect costs like transportation fees, we examine the effect of scheme on direct and indirect costs separately and together. Unless there is unobserved confounding, we expect the programme to influence only direct medical spending. The estimates in columns 4 to 6 show that the scheme exerts a negative effect on health care spending which is almost entirely due to a reduction in costs of consultation and medicine[16]. Depending on the control group, the magnitude ranges from 11 to 27 ETB or a reduction of between 21 to almost 50% of baseline expenditure. However, the effects are not always precise, depending on the choice of control group.

Table 5.5
Healthcare expenditure by CBHI membership status (balanced panel), Mean (Std. Dev.)

Outcome variable	*CBHI pilot districts*						*Non-CBHI pilot districts*		
	Insured hhds (N= 569)			*Uninsured hhd(N= 616)*			*(N= 384)*		
Outpatient care	***2011***	***2012***	***2013***	***2011***	***2012***	***2013***	***2011***	***2012***	***2013***
Consultation and medicine spending	53.4	49.8	23.0	42.8	40.9	32.0	38.7	48.4	66.7
	(218.8)	(267.1)	(97.1)	(123.4)	(195.9)	(100.4)	(130.4)	(194.0)	(321.4)
Transport and other health care related spending	13.6	15.5	13.5	6.2	7.2	10.9	8.0	12.6	13.0
	(65.7)	(78.2)	(90.0)	(30.9)	(43.8)	(47.3)	(26.2)	(55.6)	(55.8)
Total health spending	66.9	65.2	36.5	48.9	48.0	42.9	46.7	61.0	79.7
	(268.6)	(303.0)	(167.0)	(146.8)	(219.4)	(128.5)	(145.3)	(233.5)	(357.2)
Inpatient care									
Consultation and medicine spending	41.6	26.4	43.2	29.1	37.4	21.3	7.5	19.1	38.4
	(352.2)	(249.3)	(352.4)	(399.0)	(284.6)	(331.4)	(138.1)	(162.4)	(329.3)
Transport and other health care related spending	6.3	7.7	21.1	9.2	12.9	15.5	0.6	10.5	23.5
	(69.2)	(79.4)	(140.2)	(98.4)	(103.6)	(205.2)	(9.4)	(86.7)	(270.2)
Total health spending	47.9	34.2	64.3	38.2	50.3	36.8	8.1	29.5	61.8
	(410.2)	(310.9)	(456.9)	(483.0)	(363.9)	(511.0)	(147.4)	(241.4)	(443.7)

Note: In 2011, a household is categorized under insured group if the household was insured in 2012 or in 2013. Outpatient health care spending is household's health care payment (in ETB) in the two months preceding the survey; Inpatient health care spending is household's health care payment (in ETB) in the twelve months preceding the survey; Standard errors in parentheses are clustered at the village level.

Table 5.6
The impact of CBHI on out-of-pocket spending for outpatient care

Outcome variable	Fixed effects without covariates			Fixed effects with time varying co-variates			Fixed effects after matching [a]		
	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Consultation and medicine spending	-14.51	-30.05**	-22.39*	-11.04	-27.56*	-20.07	-5.355	-17.59	-15.36
	(13.35)	(13.73)	(12.72)	(13.87)	(15.23)	(13.53)	(12.13)	(19.64)	(12.02)
Transport and other health care	-2.619	-3.487	-3.277	-2.230	-3.207	-3.231	-0.868	1.577	-2.416
	(4.292)	(3.858)	(3.966)	(4.566)	(4.150)	(4.213)	(4.542)	(4.568)	(4.222)
Total health spending	-17.13	-33.53**	-25.67	-13.27	-30.77*	-23.30	-6.223	-16.01	-17.78
	(16.32)	(16.37)	(15.49)	(17.02)	(17.99)	(16.42)	(15.18)	(22.46)	(14.87)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	3,265	1,906	4,146

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; ** p<0.05, * p<0.1; Outcome variable is household's health care payment (in ETB) for outpatient care in the two months preceding the survey; [a] Nearest neighbour matching was used to create a sample of treated and matched controls.

We also estimated the effect of the scheme on health care spending as a share of household monthly expenditure. Descriptive statistics are provided in Table 5.7 while estimates are in Table 5.8. The scheme does seem to work towards reducing the share of the household budget spent on health. While across all estimates the coefficients are negative they are not always precise. At most the scheme appears to be associated with a 0.9 percent decline in the share of the household budget spent on health care. As compared to the baseline value for currently insured household this represents a 33% decline in resources spent on health care.[17]

Table 5.7
Healthcare spending as a share of expenditure by CBHI membership status (balanced panel)

Outcome variable	*CBHI pilot districts*						*Non-CBHI pilot districts (N=383)*		
	Insured households (N= 562)			*Uninsured households (N= 605)*					
	2011	***2012***	***2013***	***2011***	***2012***	***2013***	***2011***	***2012***	***2013***
Consultation/medicine spending as share of household monthly expenditure	0.023	0.015	0.007	0.022	0.014	0.011	0.016	0.015	0.018
Transport/other health care related spending as share of household monthly expenditure	0.005	0.005	0.003	0.003	0.003	0.004	0.003	0.005	0.004
Total health care spending as share of household monthly expenditure	0.027	0.020	0.011	0.026	0.017	0.015	0.019	0.020	0.022
Incidence of households where consultation/medicine spending is at least 5% of household monthly expenditure	0.132	0.089	0.042	0.131	0.083	0.073	0.081	0.096	0.099
Incidence of households where transport/other health care related spending is at least 5% of household monthly expenditure	0.030	0.035	0.009	0.023	0.023	0.028	0.013	0.029	0.016

Outcome variable	CBHI pilot districts						Non-CBHI pilot districts (N=383)		
	Insured households (N= 562)			Uninsured households (N= 605)					
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Incidence of total health care spending is at least 5% of household monthly expenditure	0.150	0.103	0.056	0.152	0.094	0.102	0.099	0.112	0.115
Incidence of households where consultation/medicine spending is at least 10% of household monthly expenditure	0.073	0.058	0.016	0.074	0.046	0.023	0.052	0.047	0.036
Incidence of households where transport/other health care related spending is at least 10% of household monthly expenditure	0.018	0.017	0.004	0.006	0.014	0.005	0.005	0.010	0.010
Incidence of total health care spending is at least 10% of household monthly expenditure	0.085	0.066	0.032	0.078	0.051	0.039	0.060	0.057	0.063

Notes: In 2011, a household is categorized under insured group if the household was insured in 2012 or in 2013. Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Healthcare spending is for both inpatient and outpatient care services.

Table 5.8
The impact of CBHI on healthcare spending as a share of expenditure

Outcome variable	*Fixed effects without covariates*			*Fixed effects with time varying covariates*			*Fixed effects after matching* [a]		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Consultation/medicine spending as share of household monthly expenditure	-0.00299	-0.00861**	-0.00586*	-0.00134	-0.00803**	-0.00490	-0.000220	-0.00662	-0.00404
	(0.00343)	(0.00336)	(0.00320)	(0.00372)	(0.00361)	(0.00347)	(0.00350)	(0.00463)	(0.00334)
Transport/other health care related spending as share of household monthly expenditure	-0.00104	-0.00131	-0.00140	-0.00101	-0.00120	-0.00143	-0.000657	0.000397	-0.00125
	(0.00118)	(0.00109)	(0.00109)	(0.00127)	(0.00117)	(0.00116)	(0.00127)	(0.00156)	(0.00118)
Total health care spending as share of household *monthly* expenditure	-0.00403	-0.00992**	-0.00726*	-0.00235	-0.00923**	-0.00633	-0.000877	-0.00622	-0.00529
	(0.00414)	(0.00404)	(0.00386)	(0.00449)	(0.00437)	(0.00418)	(0.00424)	(0.00559)	(0.00403)
Number of observations	3,501	3,090	4,650	3,316	2,906	4,363	3,230	1,892	4,111

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; * p<0.1; Healthcare spending is for both inpatient and outpatient care services; ** p<0.05, * p<0.1 [a] Nearest neighbour matching was used to create a sample of treated and matched controls.

While the CBHI has a clear effect on increasing the use of health care services, the effect on reducing the cost of accessing health care is not overwhelming. The increase in the use of health care without a corresponding increase in the amount spent on health care indicates that the cost per health care visit should have declined. To confirm the magnitude of this effect we estimate the cost of accessing outpatient care per visit, conditional on using health care. Trends in the cost of care based on an unbalanced panel are provided in Table 5.9 while estimates (difference-in-differences) of the scheme on cost of care per visit are displayed in Table 5.10.[18] As may be expected, the estimates reveal a sharp decline in the cost per visit facing insured households. The effect is driven mainly by the decline in the cost of accessing care from public facilities. The estimates in columns 4 to 6 of Table 5.10 indicate that the cost of care per visit to a public facility declines by about 35 to 54 ETB per visit. Compared to the baseline cost of 62 ETB per visit to a public facility these changes represent declines of between 56 to 87%.

Table 5.9
Cost of health care use, unbalanced panel, conditional on health care use, Mean (Std. Dev.)

Outcome variable	*CBHI pilot districts*						*Non-CBHI pilot districts*		
	Insured households			*Uninsured households*					
Outpatient care	*2011*	*2012*	*2013*	*2011*	*2012*	*2013*	*2011*	*2012*	*2013*
Modern care price	56.2	56.0	34.4	47.4	63.1	70.9	58.1	101.8	159.7
	(92.5)	(129.6)	(100.8)	(63.0)	(104.3)	(113.5)	(91.9)	(205.5)	(524.0)
Number of observations	269	200	225	205	216	181	127	118	125
Public care price	61.9	32.9	22.7	55.3	65.5	65.3	52.2	64.6	91.4
	(101.9)	(71.3)	(64.3)	(92.8)	(117.7)	(104.8)	(88.9)	(177.7)	(111.6)
Number of observations	194	159	197	154	165	135	88	86	80
Private care price	118.8	131.8	119.0	76.5	79.7	129.5	116.3	138.1	279.0
	(185.4)	(207.0)	(210.3)	(126.5)	(122.5)	(175.6)	(207.7)	(254.2)	(891.8)
Number of observations	71	60	37	60	60	51	48	55	37

Note: In 2011, a household is categorized under insured group if the household was insured in 2012 or in 2013. Cost of outpatient care use is defined as a household's payment for health care - consultation and medicine, in ETB, per outpatient visit in the two months preceding the survey.

Table 5.10
Cost of healthcare care, unbalanced panel, conditional on health care use

Outcome variable	*Diff-in-Diff without covariates*			*Diff-in-Diff with covariates*		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Modern care price	-21.29**	-81.79***	-47.55***	-24.95**	-98.71***	-55.09***
	(10.47)	(27.29)	(14.68)	(10.12)	(35.74)	(18.28)
Number of observations	1,294	1,137	1,664	1,205	1,041	1,527
Public care price	-31.32**	-54.69***	-40.11***	-34.73***	-54.26***	-41.94***
	(12.06)	(16.93)	(11.30)	(12.89)	(17.15)	(11.56)
Number of observations	1,002	857	1,256	927	792	1,156
Private care price	-16.39	-79.40	-49.21	-15.57	-130.4	-62.08
	(35.76)	(57.77)	(40.60)	(34.69)	(83.36)	(49.12)
Number of observations	337	329	477	326	302	444

Notes: Cost of outpatient care use is defined as a household's payment for health care - consultation and medicine, in ETB, per outpatient visit in the two months preceding the survey. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05.

Overall, while households are still incurring costs per visit, and the reasons for this requires investigation, there is a clear, statistically significant and substantial decline in the costs of accessing outpatient care from public health care facilities while there is no effect of the scheme on the cost of care per visit at a private facility.

5.4.4 Placebo tests

While implicit in the preceding discussion, to explicitly examine the identifying assumption underlying the empirical strategy used in the paper we compare outcome trends for the two control groups between 2011 & 2012 and between 2012 & 2013. Since neither of these groups have been exposed to the programme, in principle there should be no statistically significant differences in outcomes overtime for households belonging to these two control groups. A first indication that the parallel trends assumption holds is that we find similar results for the different control groups. In addition to this, we tested for differences in annual changes in utilization of various types of outpatient care, the absolute amount of money spent on health care and health care spending as a proportion of household expenditure, without controlling for covariates.[19] There is very little evidence to support the hypothesis that the identifying assumption has been violated. Except for six percent of the outcomes (3 out of 48), differences in outcome trends between the two groups are not statistically significant. Furthermore, as discussed above, the increase in utilization of health care is restricted to public facilities and there is no effect on the use of private care. Consistent with this pattern, there is a sharp decline in the cost per visit of using public care while there is no decline in the case of cost per visits at private care facilities. The clear effect on outcomes that should be influenced by the scheme and the lack of an effect on outcomes that are not expected to be affected also supports the claim that we are able to credibly identify causal effects.

5.5 Conclusions

To enhance access to health care services and provide financial protection against health care costs, the Government of Ethiopia introduced a pilot Community Based Health Insurance scheme in June 2011. This paper used three waves of longitudinal data canvassed before and after the introduction of the pilot, and two different control groups to identify the scheme's impact on utilization of health care and the costs of accessing

care. Depending on the control group in question, our analysis shows that as compared to the situation at baseline, the scheme leads to a 30 to 41 percent increase in utilization of outpatient care at public facilities, a 45 to 64 percent increase in the frequency of outpatient visits to public facilities, and a 56 to 87 percent decline in the cost per outpatient visit to public facilities. Due to lack of variation in inpatient utilization, we are not able to assess the effects on access to inpatient care.

The analysis shows a declining trend in health care utilization for uninsured households in the pilot districts and this could be due to crowding out effect of the scheme[20]. Our data show that a larger proportion of the respondents reported that insured patients were favoured in service provision compared to those who believed that insured patients were discriminated. Due to such inequity in access to services based on CBHI enrolment status, it is possible that utilization of care increased for insured households while it reduced for uninsured-patients. However, even if there is only a slight increase in the incidence of outpatient care use from modern providers for insured households, there is a strong increase in utilization from public providers and particularly from health centres which are supposed to provide curative health care services for insured households. Between 2011 and 2013, the incidence of outpatient care use from health centres for uninsured group in the pilot districts reduced by 3 percentage points while for insured group use of care increased by 10 percentage points (Table 5.1). This suggests that the scheme also contributed to increased utilization for insured groups by making cost of care affordable. Considering these two situations, our empirical findings can be explained by two reasons. First, we find positive impact on utilization partly because the scheme reduces cost of care for treatment group. Second, use of care for insured group increases due to an unintended crowding out effect of the programme on non-insured households. Hence, our impact results may be decomposed into a part that is due to increased utilization driven by a reduction in cost of care and a part due to relative increases as compared to the uninsured due to crowding-out effect.

The scheme also works towards reducing the effect on out-of-pocket spending but the estimates are not precise. Placebo tests to examine the veracity of the identifying assumption underlying our analysis and the lack of an effect on the use of and cost of accessing private care, which is

typically not covered by the scheme, supports a causal interpretation of the findings.

At first glance, the lack of a statistically clear effect on out-of-pocket spending is puzzling. Insights gleaned from key informant interviews and focus group discussions help shed some light on this issue. A number of scheme enrolees who participated in the focus group discussions reported that they paid for consultations and drugs. There were several reasons for this, such as forgetting to take their membership card while visiting facilities, attempting to access higher levels of care without a referral letter, and late renewal of membership. Respondents also expressed concerns about the quality of services on offer, in particular, the limited availability of drugs and equipment which then forces households to resort to private care. Finally, a number of respondents mentioned the discriminatory attitude of health providers and their tendency to favour uninsured fee-paying patients. [21]

Notwithstanding these issues, an uptake of almost half the target households within two years of scheme establishment and the large effects on utilization are impressive. As the government considers a nation-wide scale up of the scheme the results reported in this paper suggest that this scheme has the potential to meet some of the goals of universal access to health coverage.

Notes

[1] This paper is co-authored with Robert Sparrow, Zelalem Yilma, Degnet Abebaw, Getnet Alemu, and Arjun S. Bedi. The abstract of the paper has been published in *The Lancet* 381, Supplement 2, Page S92 (17–19 June 2013). The manuscript has benefited from useful comments and suggestions made by Natascha Wagner, Wendy Janssens, conference/workshop participants at the Green Temple College Human Welfare Conference, University of Oxford, May 2014; the Ethiopian Civil Service University Research in Progress Seminar, Addis Ababa, March 2014; an International workshop on Health Shocks and Community Based Health Insurance in Rural Ethiopia, Addis Ababa, Ethiopia, February 2014; a PhD Conference on International Development, Norwich City, UK, September 2013; at the 9th World Congress of the International Health Economics, Sydney, Australia, July 2013; and the Global Health Metrics and Evaluation (GHME) conference, Seattle, USA, June 2013.

[2] Typically, such CBHI schemes are non-profit initiatives built upon the principles of social solidarity and designed to provide financial protection against the impoverishing effects of health expenditure for low-income households in the informal urban sector and in rural areas (Ahuja and Jütting, 2004; Carrin et al. 2005; Tabor, 2005; Jacobs et al., 2008). Community based implies that the target population which a particular scheme is trying to reach is involved in designing and/or managing some or all aspects of such schemes.

[3] Of the 36 papers reviewed by Ekman (2004), five studies (Carrin et al., 1999; Criel and Kegels, 1997; Jowett et al., 2003; Jütting, 2001; Ranson, 2001) are considered high-quality. The first two are based on descriptive statistics and the remainder use econometric methods. However, all three studies that use regression analysis are based on cross sectional data and only one study (Carrin et al., 1999) uses longitudinal data.

[4] According to Mebratie et al., (2013) only 5 of the 35 studies on utilization that apply regression analysis using panel data (baseline and follow up). Three of these studies are on China (Yip et al., 2008; Wagstaff et al., 2009; Xuemei and Xiao, 2011). Lu et al. (2012) examine the effect of Rwanda's CBHI scheme while Levine et al. (2012) provide an assessment of a scheme in Cambodia. With regard to OOP health spending, only two studies (Wagstaff et al., 2009; Levine et al., 2012) use longitudinal data.

[5] This figure is very similar to official reports from Abt Associates which indicate an enrolment rate of 45.5% in December 2012 and 49% in December 2013.

[6] The vector X_{it} includes education of household head, demographic composition of the household, time taken to reach the nearest health centre, time taken to reach the nearest hospital, time taken to reach the nearest all weather road, access to water, access to electricity. Since variables such as household consumption, self-assessed health status, (chronic) illness history, and trust in modern care may be influenced by CBHI uptake these are not included in $X_{it.}$ However, estimates with the inclusion of time varying consumption and health status variables are similar to those reported in the paper.

[7] The full set of control variables in the propensity score equation include characteristics of the head (sex, age, education and religion), characteristics of the household (size, composition, self-assessed health status, illness experience in two months recall period, consumption quintiles), public infrastructure (travel time to the nearest health facilities, travel time to the nearest asphalt road and all weather road, access to water, source of light), trust in modern care, condition of health facility (educational level of the head of the facility, provision of on job training for head, availability of medical equipment for blood and urine tests, waiting time to get medical card and see medical doctors, perceived quality of health facility) and regional dummies.

[8] See Table A5.1 of the supplemental appendix.

[9] Results reported in Table A5.2 of the supplemental appendix.

[10] Modern health care use includes utilization of health care services from health posts, health centres, private/NGO clinics, and public/private/NGO hospitals.

[11] The impact effects in these tables are based on three-round panel survey. Estimates for 2012 and 2013 separately reveal similar patterns (see Tables A5.13 – A5.16).

[12] The positive effect of CBHI on healthcare utilization is more likely due to the direct effect of the scheme through reducing cost of care and not due to improving health awareness. In relation to the rolling out of the scheme, information on health issues is provided for both insured and non-insured households together. If the scheme increased utilization of care through improving health awareness, there would be an increase in utilization of care for control households in the pilot districts as well. As it is discussed in chapter 3, most households in rural Ethiopia recognised health problems and there was universal preference for modern care before the introduction of the scheme probably due to the introduction of health extension services and post 2003 expansion of health posts.

[13] In column 8 of the Tables 5.4 -5.6, the propensity scores were predicted based on logit model estimates of the probability of CBHI enrolment using insured households and control households from non-pilot districts. This could confound enrolment with location due to lack of variation in treatment in the non-pilot districts. As an alternative we estimated logit models using treated and control households in the pilot districts and then predicted propensity scores for non-insured households in the non-pilot districts. Insured and non-insured households who were 'on support' and 'off support' were the same using either method.

[14] Trends in utilization of inpatient care and estimates of the impact of CBHI on inpatient care utilization are provided in Tables A5.3 and A5.4 of the supplemental appendix.

[15] The descriptive information in Table 5.6 shows a strong increase in health spending in non-pilot districts. This is driven by some outliers in the follow up surveys. The differences between the means in 2011 and 2013 are not statistically different from zero at the 5 percent level. The median values of health expenditure are similar over time in non-pilot districts.

[16] Unlike unexpected out-of-pocket expenses for consultation, drug, and healthcare related transportation, CBHI membership contributions are planned spending. Hence, CBHI membership fees are not included as part of health care spending.

[17] We also find that CBHI coverage is associated with a lower probability of being exposed to incidence of potentially impoverishing health expenditure (defined as 5 and 10 percent of total household expenditure). However, similar to spending shares, the effects are not precise (not shown here but reported in Tables A5.6 and A5.7 of the supplemental appendix). Estimates based on defining the dependent variable in terms of health expenditure as a share of non-food expenditure or health expenditure as a share of non-health expenditure were similar (not reported).

[18] The analysis focuses on outpatient care, as very few individuals make use of inpatient care. The estimates are conditional on the use of health care. Imposing such a restriction leads to a sharp decline in the number of observations as this variable is not defined for households in all three waves unless they utilize outpatient care in all three waves. Hence, we provide diff-in-diff estimates based on an unbalanced panel in Table 5.8. However, results for a balanced panel of households that incurred health care expenditure in all three years also suggest a large decline in the cost per visit (reported in Table A5.8 and A5.9 of the supplemental appendix).

[19] The test results are not presented here, but in Tables A5.10, A5.11 and A5.12 of the supplementary appendix.

[20] In Table 5.1, a household was categorized under insured group in 2011 if the household was CBHI member in at least one of the two follow up surveys. There are households who changed their CBHI enrolment status between 2012 and 2013 and this affects the baseline mean values of the outcomes for insured and non-insured groups in the pilot districts. Obviously this does not have a bearing on fixed effects estimates since all households are considered as uninsured in the baseline survey. In order to check the effect of changing CBHI enrolment status on the mean values of the outcomes, we did two things. First, we produced summary tables showing trends in health care utilization after excluding those households who dropped out from or joined the scheme in 2013. Second, we also estimated the baseline mean values of the outcomes for all households in the pilot districts regardless of their CBHI enrolment status. Despite these alternative categorizations of treated and control groups, the pattern remain the same that use of care for non-insured households in the pilot districts declines overtime.

[21] The qualitative statements made by respondents does not match the information obtained from the surveys. For example, the first follow up survey shows that about 34 percent of respondents believed that health workers favored insured patients while 24 percent believed that insured patients were discriminated. 42 percent of the respondents did not think that insured patients were discriminated or favored.

6 Dropping out of Ethiopia's Community Based Health Insurance Scheme[1]

Abstract

Low contract renewal rates have been identified as one of the challenges facing the development of community based health insurance schemes (CBHI). This paper uses longitudinal household survey data to examine dropout in the case of Ethiopia's pilot CBHI scheme, which saw enrolment increases from 41 percent one year after inception to 48 percent a year later. An impressive 82 percent of those who enrolled in the first year renew their subscriptions, while 25 percent who had not enrolled join the scheme. The analysis shows that socio-economic status, a greater understanding of health insurance, and experience with and knowledge of the CBHI scheme reduce dropout. While there are concerns about the quality of care and the treatment meted out to the insured by providers, the overall picture is that returns from the scheme are overwhelmingly positive. For the bulk of households, premiums do not seem to be onerous, basic understanding of health insurance is high and almost all those who are currently enrolled signal their desire to renew contracts.

6.1 Introduction

Since the late 1990s, in a move away from user fees for health care, community-based health insurance schemes (CBHI) which involve potential clients in determining scheme benefits and in scheme management have been implemented in several developing countries.[2] The aim of such schemes is to reach out to underserved low-income groups, especially those engaged in the informal sector, and increase access to health services and provide financial protection from ill-health.

Theoretically, in the absence of formal risk-pooling options and given the financial risks associated with ill-health, such schemes should be successful in achieving high uptake and renewal rates. However, in practice,

uptake rates are typically low. The systematic review conducted based on 46 micro level studies shows an unweighted average uptake rate of 37 percent (see chapter two for more details).[3] Although information on contract renewal rates is not as widely available as information on initial enrolment, the few studies that contain such data report low renewal rates. For instance, Criel and Walkens (2003) report an initial enrolment rate for a scheme in Guinea-Conakry of 8 percent in 1998 and a drop to 6 percent one year later. In the case of the Nouna district scheme in Burkina Faso enrolment lay between 5.2 percent and 6.3 percent in the years 2004 to 2006 with a drop out rate of 30.9 percent in 2005 and 45.7 percent in 2006 (Dong et al., 2009). In Senegal, for three schemes set up between 1997 and 2001, Mladovsky (2014) reports that in 2009, scheme drop out rates ranged between 58 and 83 percent. In India the picture is no different. Bhat and Jain (2007) report a drop out rate of 49 percent for a scheme operating in Gujarat, while Platteau and Ontiveros (2013) report a drop out rate of 67 percent and an initial scheme enrolment rate of less than 2 percent in schemes operating in Maharashtra. High drop out rates clearly threaten the sustainability of such schemes, even if initial uptake is high.

While a large literature has examined factors associated with initial uptake, work on factors that determine contract renewal or prevent drop out is relatively thin. The literature suggests that there are four factors that are most likely to influence renewal rates: the quality of care on offer, health status, affordability of insurance and information failures. The last issue includes a lack of understanding of insurance and insufficient information on how to use the insurance policy. For example, in their paper on the Maliando scheme in Guinea-Conakry, which was based on focus group discussions, Criel and Walkens (2003) concluded that while affordability is an issue, the main reason for the declining enrolment rate was the poor quality of care at the health centres accessible to scheme members. Failure to understand the scheme or lack of understanding of insurance did not seem to play a role, and indeed members and non-members had a very accurate understanding of the principles of health insurance. Dong et al. (2009) identify quality of care as perceived by household heads as an important aspect determining drop out of Burkina Faso's Nouna district scheme. In addition, households with a larger number of illness episodes in the past three months were more likely to renew their contracts. Mladovsky (2014) also reports that episodes of ill-

health increase retention in Senegal while a negative perception of quality of care increases the probability of dropping out. Active participation in this scheme, which is expected to be associated with greater information on the scheme and understanding of insurance, is associated with an increase in retention. However, the study relies on cross sectional data and the direction of the causal effect is not clear as it is possible that retention enhances active participation. Platteau and Ontiveros (2013) show for Maharashtra that households with greater scheme information and better understanding of insurance were more likely to renew contracts. They also demonstrate that a better understanding of insurance reduces the negative effect of not having received any pay outs through insurance on contract renewal.

As discussed in chapter three, the Government of Ethiopia launched a pilot Community Based Health Insurance (CBHI) scheme in 13 districts. Unlike the experience of other schemes in the region, scheme uptake has been impressive and stood at 41 percent one year after scheme inception and at 48 percent after two years (Abt Associates, 2013). While drop out figures at the national level are not available, the longitudinal data on which this study is based shows that while there has been an overall increase in scheme enrolment over the two years, there is a fair amount of churn with 18 percent of households who had enrolled in the first year discontinuing their subscription in the second year and 25 percent who had not enrolled in the first year joining the scheme in the second year (see Table 6.1). While a contract renewal rate of 82 percent may seem impressive, especially given the experience of other schemes in the region, it is still a source of concern.

Table 6.1
CBHI Enrolment and drop out

Region	April 2012		April 2013					
	Enrolled		Enrolled		Dropped-out		New members	
	%	N	%	N	%	N	%	N
Tigray	33.9	101	50.2	146	26.5	26	38.3	74
Amhara	49.5	148	62.7	188	6.9	10	33.8	52
Oromiya	44.2	133	44.5	133	21.2	28	17.4	29
SNNPR	35.3	107	35.4	107	21.5	23	11.8	23
Total	**40.7**	**489**	**48.2**	**574**	**18.0**	**87**	**25.1**	**178**

Note: Among insured households in 2012, one household did not report its enrolment status and five households were not resurveyed in 2013.

This paper examines the decision to drop out of the Ethiopian CBHI scheme. While we study the effect of a range of factors in determining drop outs, we focus on scheme affordability, health status, the role of knowledge and understanding of insurance, and the quality of care. The paper draws on two rounds of longitudinal household data gathered in 2012 and 2013 and key informant interviews and focus group discussions conducted in 2012 and 2013. While straightforward, an assessment of this issue is pertinent due to the limited number of case studies and the increasing number of CBHI schemes. From a policy perspective this study is pertinent as the government of Ethiopia plans a nation-wide roll-out of the scheme.

The remainder of the paper proceeds by a description of the data. Section three discusses the research methods, section four contains empirical results and the final section concludes.

6.2 Data description

This paper draws on three different types of data – a longitudinal household survey, a health facility survey, and qualitative information from key

informant interviews and focus group discussions as described in the previous chapters.

This study is based on the surveys conducted in the 12 districts where the CBHI was offered. The surveys rounds include 1,203 households who were interviewed in 2012 and 1,186 of the same households who were interviewed in 2013. The drop-out analysis in this paper is based on 483 households who enrolled in the scheme in 2012. In addition to an extensive module on household and individual health conditions, the surveys contain information on CBHI enrolment status and extensive modules on awareness of health insurance, understanding of the CBHI scheme, scheme participation and experience with the scheme.

6.3 Empirical framework

Based on our reading of the theoretical and empirical literature as well as the information obtained from the focus group discussion and key informant interviews we identify two key factors that influence households' decisions to drop out of CBHI: affordability of the premiums and the expected returns from the insurance. The returns may depend on a number of factors. For instance, the health endowment of a household is likely to influence current and future health care needs. A good understanding of health insurance may lead to a greater appreciation of the potential usefulness of such a scheme and knowledge of the manner in which the scheme operates may make it easier for households to obtain benefits. Knowledge of insurance may also mitigate the tendency to drop out even if a household did not make use of the scheme. Finally, scheme returns are also likely to depend on the quality of the health care services on offer.

We specify the probability that a household (h) drops out ($DO = 1$) of the *CBHI* scheme in time period t (2013) as a function of a set of variables in time periods *t-1* and *t-2*. A household's ability to afford the scheme is treated as a function of a set of socio-economic characteristics (*SES*) which includes the consumption quintile in which a household falls, educational endowment of the household head and whether the household has been enrolled in or is currently a member of the productive safety net programme for food insecure households.[4] The role of current and expected health care status and use (H) is captured by a household's subjective assessment of its health status, episodes of recent

illnesses and a variable indicting whether a household used the scheme to access services in the last year. In addition, we control for a set of demographic traits (*D*) such as household size and the gender and age composition of household members. To account for the effect of understanding of health insurance (*U*) we use responses to a set of four questions (see Table 6.2 for details) to create three dummy variables which indicate whether a household has a high (all four responses are correct), medium (three out of four are correct) or low (less than three) understanding of insurance. Knowledge of the scheme (*K*) is captured by information on whether a household member attended community-level *CBHI* meetings before the scheme was launched, whether a household member has an official government position or is involved in *CBHI* management. Scheme experience (*E*) is based on responses to a set of five questions (see Table 6.2 for details) on the functioning of the scheme. The responses are classified into three dummy variables which indicate whether a household head expresses a high (4 or 5 positive responses), medium (2 or 3 positive responses) or low (0 or 1 positive responses) level of satisfaction with the scheme.

Table 6.2
Descriptive statistics by CBHI membership renewal status, 2012

Variable	*Dropped - out*		*Renewed*		*Mean diff. p-value*	*Total*	
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*
Socio-economic status							
Poorest consumption quintile	0.23	0.42	0.22	0.42	0.9144	0.22	0.41
2nd consumption quintile	0.27	0.45	0.17	0.37	0.0231	0.18	0.39
3rd consumption quintile	0.21	0.41	0.21	0.41	0.9824	0.21	0.41
4th consumption quintile	0.12	0.33	0.20	0.40	0.0819	0.19	0.39
Richest consumption quintile	0.17	0.37	0.20	0.40	0.5098	0.19	0.39
HH head education - No education at all	0.52	0.50	0.38	0.49	0.0194	0.41	0.49
HH head education - Informal	0.09	0.29	0.19	0.39	0.0259	0.17	0.38
HH head education - Primary or above	0.39	0.49	0.43	0.50	0.5393	0.42	0.49
Participates in PSNP	0.32	0.47	0.31	0.46	0.8022	0.31	0.46
Demographic traits							
Male headed HH	0.86	0.35	0.91	0.29	0.2141	0.90	0.31
Age of HH head	47.10	14.12	48.10	12.33	0.5063	47.91	12.68
Household size	6.21	2.28	6.26	2.21	0.8324	6.21	2.24
Prop. of children aged under 6	0.15	0.16	0.12	0.13	0.0264	0.12	0.13
Prop. of male aged 6 to 15	0.15	0.15	0.17	0.14	0.2288	0.16	0.14
Prop. of female aged 6 to 15	0.14	0.14	0.16	0.15	0.2008	0.16	0.15
Prop. of male aged 16 to 64	0.27	0.16	0.26	0.15	0.3428	0.26	0.15
Prop. of female aged 16 to 64	0.25	0.15	0.27	0.14	0.3895	0.26	0.15
Prop. of elderly aged above 64	0.04	0.13	0.03	0.10	0.6847	0.04	0.11
Health status and health care use							
Prop. of household members with good SAH	0.85	0.26	0.83	0.30	0.5063	0.83	0.29
Past illness event	9.48	20.05	6.78	14.54	0.1462	7.25	15.64
Chronic illness	0.16	0.46	0.20	0.80	0.6723	0.20	0.75
CBHI card used	0.19	0.40	0.36	0.48	0.0028	0.33	0.47

Variable	Dropped - out		Renewed		Mean diff. p-value	Total	
	Mean	SD	Mean	SD		Mean	SD
Understanding of health insurance							
Only sick people buy CBHI - Appropriate response	0.83	0.38	0.83	0.37	0.9045	0.83	0.38
CBHI is same as saving scheme - Appropriate response	0.82	0.39	0.87	0.34	0.2023	0.86	0.35
CBHI finances health care - Appropriate response	0.83	0.38	0.84	0.37	0.7676	0.83	0.37
CBHI premium can be returned - Appropriate response	0.80	0.40	0.78	0.41	0.6833	0.79	0.41
Health insurance understanding level – Low	0.21	0.41	0.17	0.37	0.3711	0.18	0.38
Health insurance understanding level – Medium	0.23	0.42	0.24	0.42	0.8819	0.24	0.43
Health insurance understanding level – High	0.56	0.50	0.60	0.49	0.5749	0.59	0.49
Knowledge of & participation in CBHI scheme							
No of CBHI meetings attended before implementation	2.58	1.55	2.88	2.48	0.3327	2.82	2.33
Involved in CBHI management	0.13	0.33	0.21	0.41	0.0748	0.19	0.40
Official position held	0.11	0.32	0.32	0.47	0.0001	0.29	0.45
CBHI experience and design features							
CBHI agents solve problems – Agree	0.51	0.50	0.64	0.48	0.0251	0.62	0.49
Community guides CBHI administration – Agree	0.41	0.49	0.52	0.50	0.0517	0.50	0.50
CBHI management is trust worthy - Agree	0.56	0.50	0.61	0.49	0.4078	0.60	0.49
CBHI registration service – Satisfactory	0.69	0.47	0.72	0.45	0.4877	0.71	0.45
CBHI premium collection service- Satisfactory	0.70	0.46	0.74	0.44	0.4470	0.73	0.45
Overall satisfaction with the scheme – Low	0.24	0.43	0.18	0.38	0.1377	0.19	0.39
Overall satisfaction with the scheme – Medium	0.33	0.47	0.32	0.47	0.8810	0.32	0.47
Overall satisfaction with	0.43	0.49	0.51	0.50	0.1942	0.49	0.50

Variable	*Dropped - out*		*Renewed*		*Mean diff. p-value*	*Total*	
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*
the scheme – High							
The timing of premium payment - convenient	0.77	0.42	0.80	0.40	0.6365	0.79	0.41
CBHI registration fee – affordable	0.82	0.39	0.85	0.36	0.5874	0.84	0.37
CBHI premium – affordable	0.76	0.43	0.77	0.42	0.9446	0.76	0.43
Capacity to afford for CBHI – Low	0.21	0.41	0.19	0.39	0.5755	0.19	0.40
Capacity to afford for CBHI – Medium	0.08	0.28	0.12	0.32	0.3586	0.11	0.32
Capacity to afford for CBHI – High	0.70	0.46	0.69	0.46	0.8812	0.69	0.46
Access to & quality of care							
Travel time to health centre	55.09	35.25	65.83	37.56	0.0151	63.69	37.45
Travel time to public hospital	90.87	47.13	102.87	49.21	0.0387	100.61	49.16
Health workers favour insured patients – Disagree	0.22	0.42	0.24	0.43	0.7624	0.24	0.43
Health workers favour insured patients – Neutral	0.45	0.50	0.41	0.49	0.5655	0.42	0.49
Health workers favour insured patients – Agree	0.33	0.47	0.35	0.48	0.7441	0.34	0.48
Quality of care linked to CBHI – Good	0.34	0.48	0.39	0.49	0.4004	0.38	0.49
Availability of blood testing equipment	0.83	0.38	0.94	0.23	0.0002	0.92	0.26
Waiting time to see a medical professional	23.20	19.91	29.44	24.69	0.0279	28.33	23.97
Community characteristics							
Region –*Tigray*	0.30	0.46	0.18	0.39	0.0139	0.21	0.41
Region – *Amhara*	0.11	0.32	0.34	0.48	0.0000	0.30	0.46
Region – *Oromiya*	0.32	0.47	0.26	0.44	0.2627	0.27	0.45
Region – *SNNPR*	0.26	0.44	0.21	0.41	0.2890	0.22	0.41
Observations	87		396			483	

Two sets of supply side characteristics are included to account for the health services on offer. The first set (*AS*) relates to geographical prox-

imity to healthcare services and includes travel time to the nearest health centre and public hospital using usual means of transport. The second set (*QS*) pertains to the quality of health care services on offer and includes information on the availability of medical equipment, waiting time to see a medical care provider, and perceptions of the quality of care as provided by respondents. Finally, we also include a set of regional fixed effects (θ).

The probability of dropping out of the CBHI scheme is estimated as a logit specification

$$p(DO_{ht}=1)=f(\alpha SES_{ht-1},\theta H_{ht-1},\beta D_{ht-1},\nu U_{ht-1},\omega K_{ht-1},\upsilon E_{ht-1},\delta AS_{ht-1},\eta QS_{ht-2},\theta_{rh},\varepsilon_{ht}) \quad (1)$$

for those households that were enrolled in the scheme in 2012. We regress current drop out status on past values of the various sets of covariates. This allows us to provide estimates that are less likely to be influenced by the endogenous nature of some of the explanatory variables. We estimate several variants of equation (1). We start with a baseline model. Thereafter, to probe the sensitivity of the estimates we sequentially add the understanding (*U*), knowledge (*K*) and experience (*E*) variables and then estimate a complete specification. Summary statistics are provided in Table 6.2.[5]

6.4 Results

In April 2012, about a year after scheme inception, 41 percent of eligible households had enrolled. At the time of the 2012 survey, 96 percent of the insured had indicated that they would renew their membership while 57 percent of the uninsured indicated that they planned to enrol in the future (see Derseh et al., 2013). However, actual renewal rates in April 2013 turned out to be 82 percent and 25 percent of those who had not enrolled in the first year did enrol a year later. By April 2013, enrolment stood at 48 percent (Table 6.1). There are noticeable differences across regions with CBHI uptake rate ranging from 35.4 percent in *SNNPR* to 62.7 percent in the *Amhara* region. Renewal rates also vary, from 93.1 percent in the *Amhara* region to 73.5 percent in *Tigray*.

6.4.1 Scheme affordability

The first concern is the extent to which drop out is driven by scheme costs. To assess this we draw upon a set of three questions on payment convenience and scheme affordability (see Table 6.2), the set of estimates presented in Table 6.3 and the reasons provided by those who dropped out of the scheme (see Table 6.4).

Table 6.3
Probability of dropping out – marginal effects (std. error)

Variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*
Socioeconomic status					
2nd consumption quintile (ref: poorest consumption quintile)	0.123*	0.124**	0.135*	0.123*	0.135*
	(0.0629)	(0.0622)	(0.0758)	(0.0632)	(0.0750)
3rd consumption quintile	0.0122	0.00882	0.0442	0.0111	0.0391
	(0.0510)	(0.0506)	(0.0615)	(0.0508)	(0.0566)
4th consumption quintile	-0.0350	-0.0409	-0.00614	-0.0336	-0.0137
	(0.0476)	(0.0467)	(0.0654)	(0.0479)	(0.0605)
Richest consumption quintile	-0.0567	-0.0569	-0.0264	-0.0570	-0.0230
	(0.0459)	(0.0464)	(0.0492)	(0.0472)	(0.0501)
HH head education - Informal (ref: no education at all)	-0.0804**	-0.0791**	-0.0663*	-0.0792**	-0.0659**
	(0.0342)	(0.0333)	(0.0345)	(0.0338)	(0.0316)
HH head education - Primary or above	-0.0678*	-0.0664*	-0.0419	-0.0669*	-0.0421
	(0.0369)	(0.0366)	(0.0441)	(0.0372)	(0.0428)
Participated in PSNP	-0.0945***	-0.0908**	-0.107***	-0.0943***	-0.0990***
	(0.0353)	(0.0359)	(0.0350)	(0.0351)	(0.0347)
Demographic traits					
Male headed HH	-0.0158	-0.0149	-0.0465	-0.0124	-0.0373
	(0.0494)	(0.0485)	(0.0688)	(0.0480)	(0.0659)
Age of HH head	-0.00156	-0.00147	-0.00131	-0.00169	-0.00125
	(0.00174)	(0.00173)	(0.00211)	(0.00169)	(0.00201)
Household size	-0.0110	-0.0111	-0.00635	-0.0109	-0.00682
	(0.00907)	(0.00918)	(0.00921)	(0.00933)	(0.00905)
Prop. of children aged under 6 (ref: Prop. of male aged 16 to 64)	0.0699	0.0689	-0.0817	0.0735	-0.0836

	(0.156)	(0.151)	(0.175)	(0.157)	(0.164)
Prop. of male aged 6 to 15	-0.269**	-0.262**	-0.319*	-0.261**	-0.303*
	(0.120)	(0.118)	(0.168)	(0.120)	(0.164)
Prop. of female aged 6 to 15	-0.179	-0.181	-0.200	-0.173	-0.191
	(0.169)	(0.169)	(0.169)	(0.172)	(0.167)
Prop. of female aged 16 to 64	-0.332**	-0.344**	-0.533**	-0.329**	-0.521**
	(0.152)	(0.150)	(0.221)	(0.154)	(0.214)
Prop. of elderly aged above 64	-0.00634	-0.0264	-0.0896	-0.00177	-0.107
	(0.170)	(0.166)	(0.176)	(0.171)	(0.165)
Health status and health care use					
Prop. of household members with good SAH (ref: Prop. of household members with poor SAH)	-0.0736	-0.0774	-0.117	-0.0722	-0.123
	(0.0694)	(0.0697)	(0.0820)	(0.0688)	(0.0856)
Past illness event	0.00138*	0.00139*	0.00196**	0.00134*	0.00186**
	(0.000774)	(0.000759)	(0.000843)	(0.000744)	(0.000847)
Chronic illness	-0.0439**	-0.0441**	-0.0593**	-0.0430**	-0.0590**
	(0.0179)	(0.0177)	(0.0254)	(0.0182)	(0.0245)
CBHI card used	-0.116***	-0.120***	-0.103**	-0.117***	-0.108**
	(0.0342)	(0.0346)	(0.0411)	(0.0338)	(0.0422)
Understanding of health insurance					
Health insurance understanding level - medium (ref: Low)		-0.0401			-0.0733*
		(0.0439)			(0.0395)
Health insurance understanding level - high		-0.0446			-0.0565
		(0.0420)			(0.0556)
Knowledge of & participation in CBHI scheme					
No of CBHI meetings attended before implementation			-0.00207		-0.00217
			(0.00488)		(0.00459)
Involved in CBHI management			-0.0442		-0.0494
			(0.0319)		(0.0325)
Official position held			-0.0850**		-0.0798**
			(0.0353)		(0.0333)

CBHI experience and design features					
Overall satisfaction with the scheme - Medium (ref: Low)				-0.0280	-0.0150
				(0.0396)	(0.0480)
Overall satisfaction with the scheme - High				-0.0277	-0.0213
				(0.0403)	(0.0516)
Supply side characteristics					
Travel time to health centre	-0.000464	-0.000521	-0.000866	-0.000513	-0.000921*
	(0.000538)	(0.000525)	(0.000578)	(0.000550)	(0.000547)
Travel time to public hospital	-0.000342	-0.000290	-0.000336	-0.000328	-0.000296
	(0.000395)	(0.000406)	(0.000398)	(0.000401)	(0.000398)
Quality of care linked to CBHI- Good (ref: Not good)	-0.0314	-0.0373	-0.0350	-0.0263	-0.0380
	(0.0344)	(0.0349)	(0.0373)	(0.0395)	(0.0420)
Health workers favour insured patients - Neutral (ref: Disagree)	0.00808	0.00625	-0.0117	0.00915	-0.00830
	(0.0360)	(0.0352)	(0.0403)	(0.0362)	(0.0409)
Health workers favour insured patients - Agree	-0.0187	-0.0190	-0.0421	-0.0121	-0.0301
	(0.0445)	(0.0443)	(0.0398)	(0.0441)	(0.0398)
Availability of blood testing equipment	-0.124	-0.128	-0.0713	-0.131	-0.0801
	(0.0899)	(0.0924)	(0.0853)	(0.0918)	(0.0894)
Waiting time to see a medical professional	-0.00105	-0.000935	-0.00108	-0.00102	-0.000810
	(0.00119)	(0.00121)	(0.00103)	(0.00116)	(0.00100)
Community characteristics					
Region - *Tigray* (ref: *SNNPR*)	-0.0383	-0.0403	-0.0353	-0.0374	-0.0387
	(0.0591)	(0.0583)	(0.0573)	(0.0586)	(0.0550)
Region - *Amhara*	-0.183***	-0.183***	-0.169***	-0.179***	-0.166***
	(0.0500)	(0.0492)	(0.0530)	(0.0511)	(0.0517)
Region - *Oromiya*	-0.0955**	-0.0905**	-0.0610	-0.0963**	-0.0566
	(0.0442)	(0.0454)	(0.0502)	(0.0447)	(0.0481)
Observations	459	459	376	459	376
Pseudo R-squared	0.2004	0.2030	0.2529	0.2018	0.2618
Log pseudo likelihood	-171.021	-170.479	-133.907	-170.722	-132.303

Notes: Outcome variable is CBHI membership renewal status in 2013. Explanatory variables are at their 2012 or 2011 values; standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1.

As shown in Table 6.2, 79 percent of households indicated that the timing of the premium was convenient, 84 percent mentioned that the registration fee was affordable and 76 percent found the premium affordable. There are no statistically significant differences in these affordability questions across households who renew and those who drop out. These responses are buttressed by comments received from FGD participants who argued that the premium was affordable as compared to what needs to be paid from their pocket in order to access healthcare services. Most uninsured FGD participants also shared the view of the insured that the premium was not onerous. In relation to this an uninsured participant from *Tigray* region commented,

> The CBHI contribution is not expensive since the premium is 132 ETB per annum, which is equal to the price of two chickens. I have not yet joined the scheme because I wanted to ascertain benefits from those who already joined the scheme. So far, I have seen from my neighbours experience that they get medical services almost for free because they are members of the scheme. Thus, I already decided to apply for membership in the near future [Discussed on December 07, 2012].

While the scheme seems to be affordable for the bulk of households, for 26 percent of those who drop out, an inability to pay the premium is the main reason for scheme exit (see Table 6.4).

The estimates presented in Table 6.3 show that it is households in the second consumption quintile who are particularly vulnerable as they are 12 to 14 percentage points more likely to drop out of the scheme as compared to the poorest quintile. Households with higher consumption levels are less likely to drop out but the effects are not statistically significant. There is a clear link between education of the household head and scheme retention. Household heads with primary education and even those with informal education are less likely to leave the scheme.

Table 6.4
Single most important reason for (not) renewing contract

Dropped out (N= 87)	***N (%)***	**Renewed (N= 396)**	***N (%)***
Reason for not renewing		Reason for renewing	
Illness and/or injury does not occur frequently in our household	5 (5.8)	Illness and/or injury occurs frequently in our household	37 (9.9)
The registration fee and premiums are not affordable	23 (26.4)	Pregnant women in our HH needed health care services	9 (2.4)
Want to wait in order to confirm the benefits of the scheme from others	9 (10.3)	Child/children in our HH needed health care services	27 (7.2)
Lack of awareness about the detail of how the CBHI works	28 (32.2)	To finance unexpected health care expense	145 (38.7)
The quality of health care services is low	5 (5.8)	Premium is low compared to the user fee	81 (21.6)
The benefit package does not meet our needs	5 (5.8)	Pressure from the CBHI/ *kebele* officials	40 (10.7)
CBHI management staff is not trustworthy	4 (4.6)	Pressure from other members/community	15 (4.0)
Other	8 (9.1)	Other	21 (5.5)
		The share of households that plan to renew their CBHI membership	382 (96.5)

Participation in the PSNP, which is a program catering to food insecure households is associated with a 9 to 11 percentage point reduction in scheme drop out.[6] The qualitative information suggests two reasons for this PSNP effect. First, government officials have been taking measures to integrate different development interventions such as agricultural extension, education and health programmes. A key informant in the *Tigray* region mentioned that households covered by the PSNP are

provided information on the CBHI scheme.[7] This in turn may lead to greater appreciation of the schemes potential benefits and hence an increased propensity to renew contracts. A second reason is that there may be pressure to remain enrolled if a household is receiving benefits from the PSNP scheme. In *Tigray* and *Oromiya* region, a number of the focus group discussion participants who were also covered by the PSNP complained that they had been pressured to join the scheme. As shown in Table 6.4, about 11 percent of those who have renewed their contracts indicate that they felt pressure from CBHI/kebele officials to do so.[8] A key informant in *Oromiya* argued,

> Membership is based on the willingness of the target households. However, since there is competition among the pilot villages to register higher CBHI coverage, village officials used different promotion techniques including house-to-house membership registration and collection of CBHI contribution from volunteer PSNP members during the distribution of PSNP benefits. Some people may consider this as a kind of enforcement mechanisms. Actually we should not care much about pressure on the households to participate in the scheme because enrolment benefits the community and they would be happy when they actually get medical services without out-of-pocket payment later on [Interviewed on December 25, 2012].

Overall, it seems that the bulk of households are able to afford the CBHI scheme. The estimates suggest that perhaps due to deliberate government efforts it is not the poorest households that tend to drop out from the scheme but households who are in the 2nd and 3rd consumption quintiles are more likely to struggle with scheme payment.[9]

6.4.2 Health status and utilization of health care

We now turn to the various factors that may influence scheme returns. There is no evidence that household self-assessed health status is associated with contract renewal. Experiencing a short-term illness increases the chances of dropping out, although the size of the coefficient is small. The clearest effect emanates from recent episodes of chronic illnesses which enhances scheme appeal. Across all specifications, recent experience of a prolonged illness is associated with a 4 to 6 percentage point reduction in scheme drop out.[10] This pattern does raise concerns about the risk-profile of households who continue in the scheme, an issue to which we return in the next paragraph.

While health status and the incidence of illness are included to assess the role of expected returns in influencing decisions we also have a direct measure of scheme returns. In the first year of the scheme 33 percent of enrolees indicated that they had used the CBHI card to access health services, compared to 36 percent for those who renewed contracts and 19 percent for those who didn't (see Table 6.2). The logit estimates also display this pattern, and across all specifications having used the CBHI card is associated with an 11 to 12 percentage point reduction in CBHI drop out. This suggests that a positive scheme pay out which clearly demonstrates the usefulness of the scheme encourages renewal.[11] At the same time it also raises concerns about the health status of those who do remain in the scheme. As may be expected, the incidence of recent illnesses is twice as high amongst those who have used the CBHI card (10.6 versus 5.7 percent) and the share of those with good health status (78 versus 86 percent) is also lower. Despite this pattern, the overall health risk profile of those who are enrolled in the scheme does not seem to be very different from those who have not yet enrolled. There are no statistically significant differences in terms of the incidence of illnesses, and the health status of those who are enrolled appears to be better (see Table 6.5). Furthermore, only 5.8 percent of households who drop out mention lack of illnesses as the main reason for leaving the scheme while about 10 percent mentioned that frequent illnesses is their main reason for scheme renewal (see Table 6.4).

Table 6.5
Health status in 2013 by CBHI membership status in 2013

Variable	*Enrolled*		*Non-enrolled*		*Mean diff. p-value*	*Total*	
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*
Health status and health care use							
Prop. of household members with good SAH	0.81	0.30	0.75	0.37	0.0067	0.78	0.34
Past illness event	6.43	13.48	5.56	13.1	0.2598	5.98	13.29
Chronic illness	0.22	0.66	0.17	0.65	0.2193	0.19	0.66
Observations	574		618			1192	

6.4.3 Understanding, knowledge and scheme experience

A greater understanding of health insurance, and in particular knowledge of the CBHI scheme, is expected to support retention. Prior to the pilot, health insurance was uncommon in rural Ethiopia. A campaign to raise awareness was therefore set up, described by a key informant at CARE Ethiopia as follows,

> Village officials, community leaders and health workers provide information about health insurance by moving door to door, at churches and mosques, and during other social gatherings. In addition to these, the scheme used documentary films, local mass media, amplifiers, amateur artists, pamphlets, posters, and T-shirt advertisings for awareness creation and community mobilization [Interviewed on January 27, 2013].

Our data show that on average a household attended three CBHI-related meetings before scheme launch (Table 6.2). Based on responses to a set of four questions designed to test basic understanding of insurance, it seems that these efforts have been successful. As shown in Table 6.2, more than 80 percent of the respondents are aware that the CBHI scheme is not just for the sick, that it is not a savings scheme and that that their premiums will not be returned. 59 percent provide a correct response to all four questions while 83 percent respond correctly to at

least three of the four questions. The estimates in Table 6.3 confirm that a greater understanding of health insurance reduces drop out but the effects are not precise.[12] This is perhaps not surprising as understanding of insurance appears to be quite high regardless of CBHI membership renewal status.

Of the three variables included to capture scheme-specific knowledge the clearest effect emerges from "official position held". Holding an official position in local or traditional administrative bodies is associated with an 8 percentage point reduction in dropping out. This effect is consistent with our knowledge of scheme roll-out activities. According to the qualitative data collected in the pilot regions, before scheme introduction, village officials, heads of traditional organizations, religious leaders, and other people of influence were provided information on the concept of health insurance and detailed information on the design features of the pilot CBHI. These leaders were also expected to engage in awareness raising activities. A CBHI coordinator in *Tigray* region elaborated that,

> After attending the training, community leaders participated in mobilization activities held at churches/mosques, gathering places for traditional associations, and village administrative offices. During the training, the leaders also agreed to become models in their community by first purchasing health insurance and actually almost all of them are now members of the pilot scheme [Interviewed on December 09, 2012].

Despite the number of meetings attended and the high percentage of correct responses, the single most important reason for dropping out was lack of awareness about the details of how the CBHI scheme works (32 percent amongst the dropouts, see Table 6.4). The qualitative information reveals that while basic understanding of insurance is widespread as is knowledge of the basic features of the scheme, details about the benefit package, referral system, co-payments in case hospital services are used without visiting health centres, and reimbursement of claims is not widely known. A key informant in *Amhara* region illustrates this as follow,

> Despite a number of awareness raising activities undertaken, some of the CBHI members in *Amhara* region did not even know that they needed to take their membership card when they visited healthcare providers. Because of such confusion, as they complained later on, they were forced to

pay from their pocket to get healthcare services and even buy drugs [Interviewed on January 10, 2013].

About half the respondents rated their scheme experiences as high while a third indicated a medium level of satisfaction (Table 6.2). There are no statistical differences in terms of scheme experience between the drop outs and those who renew and the estimates in Table 6.3 also show that experience with the CBHI scheme does not play a role in determining retention.[13]

6.4.4 Supply side and community characteristics

Although health centres and hospitals do not seem to be particularly accessible (64 and 101 minutes to reach these, respectively), geographical proximity to facilities is not an important factor determining renewal. The specification includes a range of variables – both subjective and objective which are designed to capture quality of care. According to the descriptive statistics a majority of households think that the quality of care on offer is not good (62 percent), although this figure does not differ across contract renewal status. While there is some evidence that a positive perception of the quality of care and availability of equipment works towards reducing dropouts, the estimates are not statistically significant.[14] During the focus group discussion a number of respondents mentioned that health workers do not treat insured workers in an equitable manner. For instance, a CBHI member in *Amhara* region argued that,

> Some nurses who are working in our village health centre consider patients with CBHI cards as poor who get free medical services by the government subsidy and they do not give equal level of treatment for both insured and non-insured people [Discussed on January 11, 2013]

Similarly, an FGD participant in Yirgalem town of *SNNPR* explained that,

> The health professionals think that insured individuals came to health centres simply for check up since they do not pay for treatment from their pockets. They give medicine only for non-members of the scheme and they tell members of the scheme to buy from private stores and we are forced to pay from our pockets for drugs whereas we have health insurance card [Discussed on January 24, 2013].

Notwithstanding these cases, the view that health workers tend to favour uninsured patients does not seem to be widespread. In fact a larger proportion mention that they are favoured rather than not. There is also no evidence that respondents' perceptions of the treatment they receive from health care providers determines dropout (Table 6.3). These effects are in marked contrast to the literature which highlights the importance of quality of care in determining retention (Criel and Walkens, 2003; Dong et al. 2009, Mladovsky, 2014). In the case of the current CBHI program the pilot districts were purposively selected, all health facilities have carried out reforms which allow them to retain fees and variations in quality of care are unlikely to be pronounced. Indeed prior to scheme launch a number of efforts were made to enhance the quality of care on offer. A key informant at the Federal Ministry of Health pointed out,

> The district governments made efforts to meet the required human resources in the facilities and the regional government invested to improve access to water and electricity in each of the facilities. The central government, on the other hand, provided medicine subsidy amounted to 40,000 ETB to each health centre and hospital in the pilot districts [Interviewed on January 27, 2013].

As pointed out earlier there are sharp differences in renewal rates across regions. Households in *Oromiya* and especially the *Amhara* region are less likely to withdraw from the CBHI scheme compared to those in *SNNP* and *Tigray* regions. For instance, households in *Amhara* region are between 17 to 18 percentage points less likely to dropout as compared to the reference region (*SNNPR*). Differences in the design features of the scheme could be one of the reasons for this pattern. As reported in section 2, CBHI members in *Amhara* and *Oromiya* regions can use higher level care from any public hospital within the regions while those in *SNNPR* can visit only the nearest hospital. Moreover, in *Amhara* and *Oromiya* regions, claims are reimbursed if non-CBHI linked facilities are used as long as the referral system has been followed while there is no such possibility in *SNNPR*.

6.5 Conclusions

This paper examines the determinants of drop out from a pilot CBHI scheme introduced by the Ethiopian government in 20011. The analysis is based on household panel data, a health facility survey and qualitative

information obtained through focus group discussions and key informant interviews. The paper focused on four issues – whether the scheme is affordable, whether renewal is more likely amongst households with specific health care status and health care use, the role of health insurance and scheme understanding and finally the role of the quality of health care in influencing uptake.

In April 2012, uptake was 41 percent and in April 2013, about two years after scheme introduction, this had risen to 48 percent. An impressive 82 percent of those who enrolled in the first year renewed their subscriptions, while 25 percent who had not enrolled earlier did join the scheme in 2013. This is a relatively high renewal rate as compared to voluntary health insurance schemes in other countries.

While socioeconomic status as measured by education of the household head reduces scheme dropout, the effect of consumption is more nuanced. We found that households belonging to the poorest quintile are as likely to continue in the scheme as compared to those in the richest quintiles (4^{th} and 5^{th}) while households belonging to the 2^{nd} quintile were about 12 percentage points less likely to continue. This is probably due to social support such as benefits from the PSNP and fee waivers that are more readily available to the poorest and food insecure households. Consistent with this interpretation, we found households who have participated or still participate in the PSNP to be 9 percentage points less likely to drop out. Responses to direct questions about premium costs and information gathered from the focus group discussions revealed that 69 percent of households rate the scheme as highly affordable.

While self-assessed health status did not have a bearing on contract renewal, recent episodes of chronic illness and especially the use of the CBHI card to access health services were found to be strongly linked to contract renewal. Clearly, scheme use leads to scheme use and while this may seem obvious it does highlight the importance of experiencing a positive scheme payout on scheme renewal. Indeed it may be argued that for health insurance schemes which are a relatively new construction in rural Ethiopia, and for that matter in other developing countries, a clear benefit demonstration effect is essential to sustain interest. However, at the same time, it does raise concerns about the health risks of those who continue in the scheme. Despite the greater probability of contract renewal amongst those who have made use of health services, the overall health risks of those who are enrolled is not statistically different as

compared to those who have not yet enrolled, most likely due to the entry of additional households.

There is some evidence that households with greater knowledge of health insurance and a greater understanding of the scheme are more likely to remain enrolled. On average at least one member of a household has attended about 3 CBHI-related meetings and basic understanding of insurance is widespread. While there were concerns about the availability and quality of care, such issues were not restricted to those enrolled in the scheme. We did not find any link between the supply side variables, both access and quality, and scheme drop out.

Notwithstanding concerns about the quality of care and the differential treatment provided to the insured, the high rate of contract renewal and the even higher rate of intention to renew contracts, shows that demand for health insurance is not a concern. A number of factors seem to have contributed to this, including the affordable premiums, successful awareness-raising activities, the use of existing social programs to disseminate knowledge and the embedding of the scheme within existing government structures such that scheme performance and uptake is one of the yardsticks on the basis of which the success of a *kebele's* administration is measured.

Notes

[1] This paper is co-authored with Robert Sparrow, Zelalem Yilma, Degnet Abebaw, Getnet Alemu, and Arjun S. Bedi.

[2] Unlike private insurance, such schemes aim to serve members on a non-profit basis. While there is substantial variation across different schemes, they typically offer a limited range of benefits for an affordable premium, with potential beneficiaries playing a role in determining scheme design.

[3] For instance, in the case of countries located in Sub-Saharan Africa, CBHI uptake in Nigeria was 6 percent after one year (Lammers and Warmerdam, 2010), 35 percent in Rwanda after seven years and 85 percent after nine years (Shimeles, 2010), 4.8 percent after two years in Senegal (Smith and Sulzbach, 2008), 11.4 percent after six years in Mali (Diop et al., 2006), 2.8 percent in Tanzania after six years (Chee et al., 2002).

[4] Consumption is measured net of health care spending. The productive safety net programme (PSNP) is a government social security programme designed to

support chronically food insecure households. Participants engage in public works and receive payments in cash or in kind.

[5] Variable definitions are provided in Table A4.1 and A6.1.

[6] About 33 percent of the PSNP beneficiaries belong to the poorest quintile and 5.2 percent are in the highest quintile.

[7] A key informant in *Tigray* region stated, "Continuous education on health issues including about the recently introduced community based health insurance scheme is provided to those people who are covered under PSNP. Moreover, during the distribution of PSNP payments, the participants are asked if they would like to register for CBHI and those who volunteer pay immediately and join" [Interviewed on December 07, 2012].

[8] We estimated all the specifications reported in Table 6.3 after dropping those who indicated that they felt pressured to renew their contracts. The estimates are not sensitive to this exclusion.

[9] The scheme is expected to provide a fee waiver for 10 percent of the poorest households. This may also explain the ability of households in the poorest consumption quintiles to afford the scheme. However, in our sample only 3.5 percent or 17 of the 489 households who were insured in April 2012 received a fee waiver and these households are evenly distributed across the five quintiles.

[10] This result may seem inconsistent with what is reported in chapter four about the relation between incidence of chronic illness and CBHI enrolment. Past experience of prolonged illness does not boost initial enrolment probably because the unit of enrolment is a household (rather than an individual) and there is a waiting period of one month before new members can use their membership card to access health care services. On the other hand, once households are insured and they have family members who suffer from prolonged illnesses, they may prefer to renew their insurance policy.

[11] In 2012, one of the most important reasons for not enrolling in the scheme was "a wait and see the benefits" response. This was provided by 16 percent (117 households) of those who did not enrol in 2012. By 2013, this reason had dropped to about 10 percent. 76 percent of those who provided this reason in 2012 had enrolled in 2013.

[12] A joint test for the statistical significance of the two dummy variables records a p-value of 0.26.

[13] A joint test for the statistical significance of the two dummy variables records a p-value of 0.92.

[14] The regional dummies absorb some of the variation in the quality of health care and the effects of the quality and access variables tends to be larger and in

some cases (availability of equipment) statistically significant if the regional dummies are excluded.

7 Summary and conclusions

This chapter begins by highlighting the main findings and policy lessons that may be derived from the thesis. It then provides information about the financial aspects of the CBHI scheme and explores the budgetary implications of a nationwide scale up of the CBHI scheme. This is followed by describing the main implementation challenges of the scheme. Finally, it points out some issues for further research.

7.1 Summary

The thesis studied health care seeking behaviour, demand for health insurance, and the effect of a pilot CBHI scheme on utilization of care and financial protection in rural Ethiopia. The study was based on three rounds of household panel data conducted before and after the introduction of the pilot scheme in 12 intervention districts and 4 control districts. In addition, the study used a health facility survey and qualitative information obtained through key informant interviews and focus group discussions. Qualitative information was used to interpret the findings of the regression results and to incorporate perceptions of policy makers, implementing bodies, and target households in greater depth.

The pilot CBHI scheme was introduced in 13 districts located in four main regional states (Tigray, Amhara, Oromiya and SNNPR) of the country. The scheme targets the population employed in the rural and urban informal sector. Scheme membership is voluntary and, in order to control adverse section, membership is allowed only at the household level. To join the scheme, households have to pay ETB 5 as a registration fee and household level premiums. Depending on the region, the household level monthly premiums range between ETB 10.50 to ETB 15 which constitutes about two to three percent of household monthly income. The benefit package of the scheme is generous and includes both outpatient and inpatient care at public health facilities. The design of the schemes requires that scheme

members visit health centres before they can access higher level care at public hospitals.

Chapter 2 provides a systematic review of 46 empirical studies on social exclusion in CBHI, effect of the schemes on health care utilization and financial protection. Unlike the narrative review, the study used a prespecified review protocol in order to understand the overall message emerging from the existing studies and identify methodological concerns which may influence the conclusions. The review showed that the poor are more likely to be excluded from CBHI schemes and there is evidence of adverse selection. The bulk of the studies found that CBHI increases healthcare service utilization while the evidence on the effect of the scheme on OOP health expenditure is mixed. The review revealed that scheme design characteristics including community participation systematically influence the effectiveness of the schemes. From a methodological point of view, most studies under review are conducted based on a single cross-sectional data set and they fail to show the dynamic effect of the scheme overtime. In order to identify the causal effect of the scheme, controlling for self-selection behaviour in scheme uptake using baseline information is needed, however, currently only a few papers are able to address such methodological concerns.

Based on context specific clinical vignettes, chapter 3 explored health-seeking behaviour of rural Ethiopian households. The analysis revealed that rural households in the country do not forego care due to their inability to recognize health problems. Almost all households (95 percent) indicated that they would not forego care when needed. The high level of awareness was attributed to the post-2003 expansion of health post and health extension services. These services which are available in every village have attempted to reduce exposure to preventable diseases by raising awareness of health issues and involving the community in hygiene and environmental sanitation activities. The chapter concluded by arguing that the main reason for the prevailing low health care use in Ethiopia is not lack of knowledge or a low-perceived need for healthcare but due to other factors such as affordability of healthcare.

Chapters 4 and 6 provided empirical evidence on the factors driving enrolment and drop out in the case of the Ethiopian CBHI scheme. Within two years of its introduction, the scheme uptake was close to 50 percent and about 82 percent of those who enrolled in the first year renewed their contracts. Such high rates of scheme uptake and renewal are rare. The key

findings from the two chapters were that the scheme does not exclude the poorest segments of the community and households from the lowest consumption quintile were at least as likely as the richest quintile to enrol and renew membership. However, households in 2nd and 3rd consumption quintiles were more likely to drop out from the scheme. The inclusion of the poorest households but not those in the 2nd and 3rd consumption quintiles is probably due to the greater availability of complementary social protection programmes which are more readily available for poorer households. In this regard, the study found that participating in a productive safety net programme (PSNP) which targets chronically food insecure households is associated with a 31 percentage point increase in CBHI enrolment and a 9 percentage point reduction in drop out.

Unlike the evidence in other studies (e.g. see Lammers and Warmerdam, 2010; Wang et al., 2005; Zhang and Wang, 2008) adverse selection was not found to be a serious threat in the Ethiopian scheme. This is possible as scheme membership is allowed only at the household level and there is a waiting period of at least one month before new members can access health care services. The bulk of the studies on determinants of CBHIs control for geographical proximity to care but do not take into account the influence of quality of care (for instance see Aggarwal, 2010; Chankova et al., 2008; Shimeles, 2010). One of the contributions of the current study is that it combines household survey with a health facility survey to investigate the potential roles that could be played by supply side factors. The empirical evidence shows that indeed quality of care matters in the decision to subscribe to CBHIs.

The analysis showed that greater knowledge of health insurance and a greater understanding of the scheme boost scheme retention. Prior to the current pilot, community based health insurance schemes were not familiar in rural Ethiopia and a number of efforts have been made to raise awareness. As a result, on average at least one household member had attended three CBHI-related meetings before scheme launch and basic understanding of insurance is widespread. However, limited knowledge about the details of the programme (like benefit packages, referral system, and requesting for reimbursements) emerged as one of the major reasons for dropping out of the scheme. Buttressing this claim, the analysis revealed that village officials and community leaders who were given more detailed information on the design features of the pilot CBHI were 11 percentage points more likely to join the scheme and 8 percentage points less likely to drop out.

The success of health insurance schemes should not be assessed only in terms of coverage. It is equally important to examine the impact of the scheme on relevant outcomes. Chapter 5 adds to the relatively small body of work that evaluates the impact of CBHI schemes on health care use and financial protection in a rigorous manner. The analysis found that CBHI membership is positively associated with healthcare usage in rural Ethiopia. Insured households are 8 to 11 percentage points more likely to use outpatient care at a public facility. Compared to the baseline value, this means a 30 to 41 percent increase in utilization of care. Moreover, enrolment leads to a 45 to 64 percent increase in the frequency of outpatient visits to public health providers. Among different health care providers, the scheme increases use of public care but not private care. This is because the scheme provides coverage for health care use from public providers and not from private providers.

This thesis also examine the impact of the scheme on the cost of care per visit and out-of-pocket health expenditure which is an important source of financing for the Ethiopian health system. The findings show that the pilot schemes are effective in reducing average medical costs but not out-of-pocket health care spending. Scheme subscription leads, to a 56 percent decline in the cost per outpatient visit to public facilities. The results in this study are consistent with the literature that finds mostly positive effect of CBHIs on healthcare access but mixed results on financial protection against out-of-pocket health care spending (Gustafsson-Wright et al., 2013; Diop et al., 2006; Wagstaff et al., 2009).

7.2 Policy lessons

Overall, the analysis presented in this thesis showed that, unlike the experience of many Sub-Saharan African Countries, the Ethiopian CBHI scheme is successful along several dimensions - uptake is high, retention is high, there is increased utilization of outpatient care, and while there is not much change in OOP expenditure the cost of using health care clearly falls. A review of the literature and the analysis of the Ethiopia scheme yields several policy lessons.

Lesson 1: There is a link between scheme design characteristics and scheme effectiveness

CBHI schemes introduced through a top-down approach by central and local governments appear to be more effective in creating access to curative healthcare services and in reducing OOP healthcare expenditure compared to community-run schemes. In contrast, community pre-payment schemes are more effective in reaching the ultra-poor. Availability of external funds, in addition to membership contributions, makes CBHI schemes more effective in extending access to care and providing financial protection but not in reaching marginalized groups. Community participation in designing and implementing CBHI schemes is positively associated with healthcare utilization and financial protection.

Lesson 2: Introduction of effective CBHI scheme requires adequate preparation

The Ethiopian scheme implementation was preceded by a number of steps which provided a foundation for the introduction of the insurance scheme. These included, since 2003, the introduction of health extension services and expansion of health posts at village level. These services raised awareness of health issues and created a preference for modern health care services. The pilot scheme was purposively introduced in those districts where health centres and public hospitals had implemented health care reforms - specifically, fee retention. These health facilities were allowed to use their internally generated resources to cover their operating costs and to improve the quality of healthcare services. Moreover, prior to the introduction of the scheme there were investments in the quality of care which included employment of additional health workers, improving health infrastructure, and distribution of essential drugs to health centres and hospitals. Finally, the introduction of the scheme was preceded by a range of insurance awareness creation activities which involved village officials, community leaders, health workers, local journalists and amateur artists.

Lesson 3: Affordable premiums with acceptable benefit package boost enrolment

The premium is set at a level that is affordable for a majority of households and there are very few restrictions on scheme coverage. Scheme premiums were decided on the basis of feasibility studies and the level of premiums vary across the pilot districts and are sensitive to local conditions. Moreover, local level officials and community representatives are able to adjust the interval of premium collection based on local conditions. In order to enhance affordability, a quarter of the premium is subsidised and the poorest segments of the community get a fee waiver. While quality of care remains an issue, the qualitative work shows that the benefit packages of the scheme which covers outpatient and inpatient healthcare services is appreciated by the target households.

Lesson 4: Involvement of local administrative bodies in the scheme design and implementation processes plays a role in the success of the scheme

The Ethiopian scheme is embedded in existing government administrative structures. Most mutual health insurance schemes in other Sub Saharan African are stand-alone schemes and there is limited involvement of local level government administrative bodies (Jütting, 2003; Lammers and Warmerdam, 2010; Robyn et al., 2011). In the case of the Ethiopian CBHI experiment, the selection criteria of the pilot districts, among other things, include commitment of the district to support and implement the schemes. Moreover, the district and village administration are evaluated based on CBHI uptake and retention and this creates incentives to invest their resources and time in the scheme.

7.3 Scheme sustainability

The overall evidence provided in this thesis tends to lead to an optimistic picture of the ability of the scheme to enhance access to health care. While demand for health insurance is perhaps not such a serious concern, an issue which has not received much attention is whether such a scheme is financially sustainable. While a detailed analysis is not within the ambit of the

thesis, the following paragraphs provide a brief assessment based on information about scheme revenues and claims.

The latest available data show that by the end of June 2014, 157,553 out of the 300,799 target households (52.4 percent) had enrolled in the scheme of which 132,368 insured households (44 percent of target households) are paying members (Table 7.1) while the remainder (8.4 percent) are granted a waiver. Across the 13 pilot districts, scheme uptake ranges from 35.5 percent in Deder district to 100 percent in Yirgalem district and the share of non-paying members ranges from 1.6 percent in Damboya district to 15.1 percent in Yirgalem district.

Table 7.1
Number of households enrolled in the CBHI scheme, June 2014

Pilot region	Pilot district	Total pop.	No. of HHs	No of registered HHs			Enrolment rate (%)		
				Paying	Non-paying	Total	Paying	Non-paying	Total
Tigray	Ahferom	196, 470	35,051	12,861	3,929	16,790	36.7	11.2	47.9
	K/Awlaelo	112,788	21,119	11,498	2,655	14,153	54.4	12.6	67.0
	T/Adiabo	101,710	19,020	7,824	2,067	9,891	41.1	10.9	52.0
	Tigray Total	**410,968**	**75,190**	**32,183**	**8,651**	**40,834**	**42.8**	**11.5**	**54.3**
Amhara	S. Achefer	148,975	25,595	14,209	1,570	15,779	55.5	6.1	61.6
	Fogera	206, 730	40,506	13,030	2,440	15,470	32.2	6.0	38.2
	Tehuledere	107, 000	20,527	16,246	2,505	18,751	79.1	12.2	91.3
	Amhara Total	**462, 705**	**86,628**	**43,485**	**6,515**	**50,000**	**50.2**	**7.5**	**57.7**
Oromia	Deder	255,134	39,742	9,678	4,423	14,101	24.4	11.1	35.5
	Gimbichu	96,938	16,614	10,481	641	11,122	63.1	3.9	66.9
	Kuyu	135,782	23,463	5,490	3,041	8,531	23.4	13.0	36.4
	L. Kossa	177,354	26,855	10,912	697	11,609	40.6	2.6	43.2
	Oromia Total	**665,208**	**106,674**	**36,561**	**8,802**	**45,363**	**34.3**	**8.3**	**42.5**
SNNP	Yirgalem	34,837	3,455	2,934	521	3,455	84.9	15.1	100.0
	D. Woyde	110,985	16,254	8,833	500	9,333	54.3	3.1	57.4
	Damboya	94, 336	12,598	8,372	196	8,568	66.5	1.6	68.0
	SNNP Total	**240,158**	**32,307**	**20,139**	**1,217**	**21,356**	**62.3**	**3.8**	**66.1**

Grand Total	**1,779,039**	**300,799**	**132,368**	**25,185**	**157,553**	**44.0**	**8.4**	**52.4**

Source: Health Sector Financing Reform (HSFR) project, Abt Associates

The scheme has three revenue sources – premium contributions, targeted subsidies for indigent groups provided by district and regional governments and a general subsidy provided by the central government. While the plan was to provide a fee waiver for 10 percent of the target households, Table 7.1 shows that the share of target households who obtain fee waivers varies across the pilot districts from 1.6 to 13 percent. According to information obtained from key informant interviews, the pilot districts allocate budgets for the targeted subsidy according to their capacity.

At the end of June 2014, about three years after its introduction the pilot scheme had cumulative revenues of ETB 57.1 million (Table 7.2). Out of these resources, ETB 29.4 million had been collected from paying households in the form of registration fees and premium payments. Subsidies transferred to the pilot scheme amounted to ETB 27.7 million - ETB 12.1 million in the form of targeted subsidies and ETB 15.6 million as general subsidies. Reimbursement claims have amounted to ETB 30 million, which implies that the revenues-to-claims ratio is 190 percent (Table 7.3). Even without subsidies, the scheme could cover 98 percent of claims from membership contribution.

Table 7.2
Cumulative CBHI revenues and reimbursement claims up to June 2014 (in 000 ETB)

Region	Pilot district	*Revenues*				*Reimbursement claims*
		Membership contribution	*Targeted Subsidy*	*General Subsidy*	*Total revenue*	
Tigray	Ahferom	2,380.73	1,853.65	1,339.78	5,574.16	2,410.87
	K/Awlaelo	1,993.43	1,070.40	1,119.91	4,183.74	2,043.44
	T/Adiabo	1,454.07	935.31	745.46	3,134.84	2,079.24
	Total Tigray	**5,828.23**	**3,859.36**	**3,205.14**	**12,892.73**	**6,533.55**
Amhara	D. Achefer	4,535.95	1,332.49	1,866.93	7,735.37	3,773.01
	Fogera	2,082.75	1,337.89	1,654.54	5,075.17	4,064.01
	Tehuledere	5,539.61	1,576.67	2,050.79	9,167.07	5,217.90

	Total Amhara	**12,158.31**	**4,247.05**	**5,572.25**	**21,977.61**	**13,054.92**
Oromiya	Deder	1,353.56	1,036.00	1,317.97	3,707.53	1,008.47
	Gimbichu	3,861.48	577.44	1,273.14	5,712.06	1,417.25
	Kuyu	689.34	1,100.48	705.37	2,495.19	611.78
	L. Kossa	1,989.75	848.93	1,266.50	4,105.19	2,036.84
	Total Oromiya	**7,894.13**	**3,562.85**	**4,562.99**	**16,019.96**	**5,074.35**
SNNP	Yirgalem	505.53	176	387.45	1,068.98	876.73
	D. Woyde	1,426.35	177	962.09	2,565.44	1,993.32
	Demboya	1,589.89	85	873.98	2,548.87	2,437.82
	Total SNNP	**3,521.78**	**438**	**2,223.52**	**6,183.30**	**5,307.87**
	Grand Total	**29,402.45**	**12,107.26**	**15,563.91**	**57,073.61**	**29,970.69**

Source: Health Sector Financing Reform (HSFR) project, Abt Associates

However, we see substantial variation across districts in the contributions-to-claims ratio and the reliance on subsidies to sustain financial viability. Table 7.2 reveals that 8 out of 13 pilot districts paid out more to health facilities than they collected from the scheme members and if there were no government subsidies, these districts would not have been able to meet the claims. In terms of financial viability, Gimbichu district is strongest as the district collected 273 percent of reimbursement claims while Fogera district is the lowest with a 51 percent contribution to claim ratio (Table 7.3). Overall, the financial figures show that pilot districts in Oromiya region are relatively stronger and districts in SNNP are weaker. While the reasons for the difference in contribution-to-claim ratio across the pilot districts and regions need further analysis, this is possibly due to disparity across the pilot sites in terms of poverty level, access to quality care, and scheme design. As described in chapter four, SNNP is a relatively poorer region and the scheme benefits are also less attractive compared to other regions.

Table 7.3
The relative share of resource generated from internal and external sources, June 2014

Region	Pilot district	*Revenue to claim ratio (%)*	*Contribution to claim ratio (%)*	*Subsidy to revenue ratio (%)*		
				Targeted Subsidy	*General Subsidy*	*Total*
Tigray	Ahferom	231.2	98.7	33.3	24.0	57.3
	K/Awlaelo	204.7	97.6	25.6	26.8	52.4
	T/Adiabo	150.8	69.9	29.8	23.8	53.6
	Total Tigray	**197.3**	**89.2**	**29.9**	**24.9**	**54.8**
Amhara	D. Achefer	205.0	120.2	17.2	24.1	41.4
	Fogera	124.9	51.2	26.4	32.6	59.0
	Tehuledere	175.7	106.2	17.2	22.4	39.6
	Total Amhara	**168.3**	**93.1**	**19.3**	**25.4**	**44.7**
Oromiya	Deder	367.6	134.2	27.9	35.5	63.5
	Gimbichu	403.0	272.5	10.1	22.3	32.4
	Kuyu	407.9	112.7	44.1	28.3	72.4
	L. Kossa	201.5	97.7	20.7	30.9	51.5
	Total Oromi-ya	**315.7**	**155.6**	**22.2**	**28.5**	**50.7**
SNNP	Yirgalem	121.9	57.7	16.5	36.2	52.7
	D. Woyde	128.7	71.6	6.9	37.5	44.4
	Demboya	104.6	65.2	3.3	34.3	37.6
	Total SNNP	**116.5**	**66.4**	**7.1**	**36.0**	**43.0**
	Grand Total	**190.4**	**98.1**	**21.2**	**27.3**	**48.5**

Source: Health Sector Financing Reform (HSFR) project, Abt Associates

There is also variation in the relative size of revenue obtained from subsidies across the pilot districts and regions. The size of subsidy as a share of total revenue is lowest in Gimbichu district (32.4 percent of revenue) and is highest in Kuyu district (72.4 percent of revenue). In Tigray and Oromiya

regions, more than 50 percent of the scheme revenue is obtained from government subsidies.

What are the budgetary implications of these subsidies if the government were to attempt a nationwide scale up? According to the 2013 World Bank population estimates, about 76.6 million (81 percent of total population) live in rural Ethiopia. Considering 6 average household size, there are about 12.8 million rural households in the country. As mentioned above, the pilot scheme received ETB 12 million in the last three years (average annual ETB 4 million) as targeted subsidies and ETB 15.6 million (average annual ETB 5.2 million) as general subsidies and the scheme insured 157,553 households.

Based on the current rate of subsidization, in order to insure that all rural households are covered, central and local governments would have to allocate about ETB 325 million per year for the targeted subsidy and ETB 423 million for the general subsidy (Table 7.4). In 2013/14 fiscal year, the public health budget allocated by central and local governments excluding scheme subsidies was ETB 4.59 billion and budget deficit amounted to ETB 16.6 billion. Since there are about 15.8 million households (both rural and urban) in country, the total subsidy per household per year amounts to ETB 47.3 (USD 2.4) which may be compared with the 2013/14 fiscal year public health budget per household (ETB 291 (USD 15)). These targeted and general subsidies imply a 16.3 percent increase in the health budget and an increased in the government budget deficit up by 4.5 percent (Table 7.4).

Table 7.4
Projected annual government subsidies needed to a nationwide scale up of CBHI scheme under alternative scenarios

Scenario	*Amount of subsidy needed (in million ETB)*	*The share of public health budget to be increased in order to provide scheme subsidies (in %)*	*Increase in budget deficit due to scheme subsidies (in %)*
To provide only targeted subsidy without the need to pool the scheme at national level	325.0	7.1	2.0
To provide only general subsidy without the need to pool the scheme at national level	422.5	9.2	2.5
To provide targeted and general subsidies without the need to pool the scheme at national level	747.5	16.3	4.5
To provide subsidy in order to cover only 2 percent of reimbursement claims after pooling the scheme at national level	48.7	1.1	0.3

Note: The above estimates consider the 2013 World Bank population estimates in rural Ethiopia (76.6 million people or 12.8 million households considering 6 average household size) (World Bank, 2014) and currently insured households (157,553 households). The subsidy projection is based on the current rate of subsidisation which is ETB 4 million average annual targeted subsidy and ETB 5.2 million general subsidies and ETB 10 million average annual reimbursement claims made to CBHI linked facility. It is also assumed that the scheme will be able to cover 98 percent of reimbursement claims from membership contribution if it is pooled at national level and only 2 percent of claims (currently this amounts to ETB 0.6 million) is needed to be subsidised to make the scheme financially sustainable. The effect of scheme subsidy on health budget is calculated considering the 2013/14 annual health budget net of CBHI subsidies (ETB 4.59 billion). The effect of scheme subsidy on budget deficit is calculated considering the 2013/14 budget deficit (ETB 16.6 billion) (MoFED, 2014).

The financial implications of other possibilities which entail elimination of the general subsidy or the targeted subsidy are provided in Table 7.4. The most cost-effective of these includes pooling the financial resources of the scheme at the national level, retaining membership contributions at current levels and subsidising only the gap between revenues and claims. Based on

the current revenue to claim ratio of 98 percent, the scheme needs only ETB 49 million annual subsidy (or ETB 3.8 (USD 0.19) subsidy per household per year) from the government. This implies that the health budget needs to increase by only 1 percent to fill the shortfall of the scheme.

To reduce the financial dependence of the scheme on government budget, it seems therefore that pooling the scheme at national level is a better option rather than pooling the scheme only at district level. Of course it should be noted that pooling the scheme at national level has its own drawbacks and it would be difficult and costly to administer the scheme at central level. Currently, financial risks of health shocks are pooled at district level and there is no possibility for cross subsidisation of resource from those districts that have net savings to those districts which spend more than they have collected. Overall, the figures presented here suggest that a nationwide expansion of the scheme is possible with an arguably modest increase in resources and some changes in scheme design especially with regard to risk-pooling. Exploring the appropriate level at which the schemes may be pooled from a financial and administrative perspective and the amount and type of subsidy which should be pursued in case of a nationwide scale are issues that need further analysis. .

7.4 Implementation challenges faced by the Ethiopian CBHI scheme

As shown in Table 7.2, within three years of operation, contracted health facilities have received a total ETB 30 million from the scheme. According to the 2012/13 Federal Ministry of Health Annual Report, the health facilities linked to the schemes are using financial resources obtained from the scheme to enhance drug availability, to purchase necessary medical equipment (like microscopes, haematology complete blood count machines, doppler ultrasound machines, and modern dental equipment), improve infrastructure (such as insuring safe water supply and electricity generator), renovate and expand facilities (like patient waiting areas and registration card rooms) and improve staff motivation (including construction of staff residence and provision of transportation and subsidised cafeteria services) (FMoH, 2013).

Notwithstanding this expenditure on improving quality, the empirical analysis suggests that the most common problem in the pilot districts is lack

of access to quality health care. In addition, there have been complaints about discriminatory practices of some health care professionals who tend to provide more attention to user fee paying patients than insured patients. Continued investments of resources generated through the schemes and otherwise are needed to improve quality of care. Additionally, steps need to be taken to ensure that insured patients are not discriminated.

Schemes are supposed to provide both outpatient and inpatient healthcare services without co-payment, yet it seems that insured households pay for some of their medical costs. Focus group participants explained that they incur out-of-pocket health spending because of forgetting to carry their membership card, lack of understanding of the details of the referral system, lack of drugs and medical equipment in the health facilities, using care directly from public hospitals and other providers as a result of dissatisfaction with the quality of health workers in the health centres. Such implementation challenges need due attention and call for continuation of scheme awareness activities beyond what has already been done before scheme introduction. Gathering systematic feedback from members and addressing challenges which inhibit the scheme from achieving its full impact are essential if the it is to retain membership.

Finally, about 10 percent of insurance members reported that they joined the schemes because they had been pressured from village/CBHI officials to do so. While this boosts enrolment it is not consistent with the spirit of a community-based voluntary programme. Given the role of scheme use on scheme retention, demonstrating scheme benefits using testimonies of CBHI beneficiaries may be an alternative as opposed to force.

7.5 Future research

The research presented in this thesis still leaves a number of unanswered questions for which more research is warranted. First, this study examines the average effects of CBHI and does not address heterogeneity of treatment effects by gender, age groups, socioeconomic status, ethnicity and geographical location. Second, scheme uptake and retention is heavily influenced by access to the Productive Safety Net Programme. The reasons behind this are not so clear and need investigation. Bundling of various programmes may play a strong role in extending social protection to the poorest households. Third, the systematic review shows that the specific characteristics of the CBHI have a bearing on the performance of the

schemes. In the case of the Ethiopian experiment, the 13 pilot districts have some differences in terms of premium level, membership renewal procedures, and the possibility of accessing higher level medical care. An assessment of the design features and their role in influencing relevant outcomes is needed. Finally, financial analysis presented here is illustrative and far from complete as it focuses only on revenues and claims and does not take into account the administrative costs of running the schemes. The extent to which resources generated from the CBHI scheme can be used to cover operating cost of health facilities and to expand quantity and improve quality of healthcare supply is an issue for future research.

Appendices

Table A2
List of papers included in the review

Author(s)	*Country*	*Scheme*	*Scheme-Type*[1]	*Year of study*	*Scheme coverage*	*Outcome variable*	*Method of analysis*	*Findings*	*Remarks*
Aggarwal (2010)	India	Yeshasvini	Gov't	2007-08	3 million individuals	Social exclusion	Logit model	Richer groups were more likely to enrol	The study attempts to reduce selection bias but baseline differences between treatment and control groups are not controlled.
Atim (2000)	Ghana	Nkoranza community health insurance Scheme	Provider	1999	30% of population	Adverse selection	Simple descriptive	There is evidence for adverse selection	The study compares the socio-economic status of insured households.
Carrin et al. (1999)	China	RCMS	Gov't	1993 &1995	31 to 100 %	OOP payment	Simple descrip-	Reduction in health	The study collects baseline information but

Author(s)	*Country*	*Scheme*	*Scheme-Type*[1]	*Year of study*	*Scheme coverage*	*Outcome variable*	*Method of analysis*	*Findings*	*Remarks*
					of pop.		tive	care costs	does not use it appropriately. The analysis on financial protection effect is based on descriptive analysis.
Chee et al. (2002)	Tanzania	Hanang district health fund	Gov't	2001	2.8% of households	Outpatient care	Simple descriptive	CBHI members more likely to use services	The results are based on healthcare service utilization data obtained from selected providers and the sample may not be representative.

[1] 'Scheme type' indicates whether the scheme is a community prepayment health organization (Com'ty); Health care provider initiated insurance scheme (Provider) or a Government-run community-involved health insurance scheme (Gov't).

Author(s)	Country	*Scheme*	*Scheme-Type*	*Year of study*	*Scheme coverage*	*Outcome Variable*	*Method of analysis*	*Findings*	*Remarks*
Chen and Yan (2012)	China	URBMI	Gov't	2007 & 2008	n/a	Social exclusion	Random effects logit model	Sig. pos. effect	The results are based on longitudinal data which include baseline information
						Adverse selection	Random effects logit model	Sig. pos. effect	
Criel and Kegels (1997)	Congo	Bwamanda hospital health insurance	Provider	1986-1995	41% of the population	Inpatient care	Descriptive statistics	Sig. Pos. effect	Does not control for differences between the socio-economic and demographic characteristics of insured and uninsured groups.
Desmet (1999)	Bangladesh	Gonosasthya	Com'ty	1995	27.5% of households	Inpatient care	Simple descriptive	Insured households use more curative care than non-members	Data is from healthcare providers. Does not control for differences between the characteristics of insured and uninsured households.
						Outpatient care	Simple descriptive	Insured households use more hospitalization care than non-members	
		Grameen	Provider	1994	41%	Outpatient care	Simple descriptive	Insured households use more care than uninsured	

Author(s)	Country	Scheme	Scheme-Type	Year of study	Scheme coverage	Outcome variable	Method of analysis	Findings	Remarks
Devadasan et al. (2007)	India	ACCORD	Provider	2003-04	35% of the population	Catastrophic OOP payment	Simple descriptive	Reduced from 8% to 3.5%.	The data were obtained from insurance claimants who were hospitalized during the study period. There is no control group.
		SEWA	Com'ty	2003-04	20% of the population	Catastrophic OOP payment	Simple descriptive	Reduced from 49% to 23%.	

Author(s)	Country	Scheme	Scheme-Type	Year of study	Scheme cover-age	Outcome variable	Method of analysis	Findings	Remarks
Diop et al. (2006)	Ghana	Nkoranza hospital insurance Scheme	Provider	2004	n/a	Social exclusion	Logit model	No effect	The study does not control for the en-dogeneity of scheme participation.
						Outpatient care	Logit model	Sig pos. effect	
						Inpatient care	Logit model	No effect	
						OOP payment	Log-linear	No effect	
						Catastrophic OOP payment	Log-linear	Sig. neg. effect	
	Mali	Bla and Sikasso scheme	Com'ty	2004	3.3 to 11.4 % of the population	Social exclusion	Logit model	Sig. pos. effect	
						Adverse selec-tion	Logit model	Sig. pos. effect	
						Outpatient care	logit model	Sig. pos. effect	
						OOP payment	Log-linear	No effect	
	Senegal	26 Mutual Health Or-ganizations	Com'ty	2004	n/a	Social exclusion	Logit model	Sig. pos. effect	
						Adverse selec-tion	Logit model	Sig. pos. effect	

Author(s)	Country	Scheme	Scheme-Type	Year of study	Scheme cover· age	Outcome variable	Method of analysis	Findings	Remarks
						OOP payment	Log-linear	No effect	
						Catastrophic OOP payment	Log-linear	Sig. neg. effect	

Author(s)	Country	Scheme	Scheme-Type	Year of study	Scheme coverage	Outcome Variable	Method of analysis	Findings	Remarks
Dror et al. (2009)	India	UpLift Health	Com'ty	2005	16,356 individuals	Social exclusion	Descriptive statistics	No effect	In addition to the household survey, the study collects and uses information by interviewing managers of the scheme. However, the study does not control for differences in socio- economic and other household characteristics between insured and uninsured households.
						Inpatient care	Descriptive statistics	Sig. pos. effects	
		BAIF	Com'ty	2005	600 individuals	Social exclusion	Descriptive statistics	No effect	
						Inpatient care	Descriptive statistics	Sig. pos. effects	
		Nidan	Com'ty	2005	10189 individuals	Social exclusion	Descriptive statistics	Non-insured people were wealthier than insured people	
						Inpatient care	Descriptive statistics	Sig. pos. effects	

Author(s)	*Country*	*Scheme*	*Scheme Type*	*Year of study*	*Scheme coverage*	*Outcome variable*	*Method of analysis*	*Findings*	*Remarks*
Dror et al. (2005)	Philippines	Six micro health insurance units	n/a[1]	2002	n/a	Adverse selection	Simple descriptive	No evidence of adverse selection	The data has been collected though field surveys. Robustness of results has been examined. Evidence of selection bias, which is not controlled for.
						Inpatient care	Descriptive statistics	Sig. pos. effect	
Ekman (2007)	Zambia	Prepayment scheme	Gov't	1998	n/a	Catastrophic OOP payment	Logit model	Sig. increase in the risk of catastrophic payment	In order to check the robustness of the finding, the study employs several sensitivity analysis for alternative definitions of the outcome variable and model specifications.
Franco et al. (2008)	Mali	Four mutual health organizations in Bla and Sikasso	Gov't	2003-04	3.3 to 11.4 % of the population	Social exclusion	Logit model	No effect	Does not control for selection bias.
						Outpatient care	Logit model	Sig pos. effect	
						OOP payment	OLS	Sig. neg. effect	
Galárraga et al. (2010)	Mexico	Seguro Popular (SP)	Gov't	2006	44% of households	OOP Payment	Instrumental variables	Sig. neg. effect	The study applies instrumental variables techniques on cross sectional data to deal with endogeneity and self-selection problems in insurance enrolment decisions.

[1] There is no clear information on establishment and management of the schemes

Author(s)	*Country*	*Scheme*	*Scheme-Type*	*Year of study*	*Scheme coverage*	*Outcome variable*	*Method of analysis*	*Findings*	*Remarks*
Gnawali et al. (2009)	Burkina Faso	Nouna CBI	Com'ty	2006	5.2 % of households	Social exclusion	Logit model	Sig. pos. effect	The study applies PSM on cross-section data. Does not control for unobserved differences between treatment and control.
						Outpatient care	PSM	Sig. pos. effect	
						Inpatient care	PSM	No effect	
Gobah and Liang (2011)	Ghana	ADMHIS	Gov't	2010	63.5 % of the population	Utilization	Descriptive statistics	Sig. pos. effect	Both quantitative and qualitative data used for analysis

Author(s)	Country	Scheme	Scheme Type	Year of study	Scheme coverage	Outcome variable	Method of analysis	Findings	Remarks
Gumber (2001)	India	SEWA	Com'ty	1998-99	63,000 individuals	Social exclusion	Multinomial logit	No effect	The study is based non- randomly selected data. In addition, it is not clear why the author uses multinomial logit model to examine the determinants of enrolment to SEWA scheme.
						Adverse selection	Multinomial logit	Mixed [1]	
						Outpatient Care	Multinomial logit	Sig. pos. effect	
						Inpatient Care	Multinomial logit	No effect	
						OOP payment	OLS	No effect	
		ESIS	Gov't	1998-99	n/a	Outpatient Care	Multinomial logit	No effect	
						Inpatient Care	Multinomial logit	Sig. pos. effect	
						OOP payment	OLS	Sig. neg. effect	
		Mediclaim	Com'ty	1998-99	n/a	Outpatient Care	Multinomial logit	No effect	
						Inpatient Care	Multinomial logit	No effect	
						OOP payment	OLS	Mixed	

[1] No significant difference between members and non-members in terms of previous chronic illness or hospitalization history. However, married individuals, who expected need for maternal care are more likely to become members of the scheme.

Author(s)	*Country*	*Scheme*	*Scheme Type*	*Year of study*	*Scheme coverage*	*Outcome variable*	*Method of analysis*	*Findings*	*Remarks*
Hamid et al. (2011)	Bangla-desh	Grameen Bank	Provider	2006	n/a	Utilization	Probit model	Sig. pos. effect	The paper considers endogeniety and spill-over effects of the programme.
Ito and Kono (2010)	India	Yeshasvini	Gov't	2008	n/a	Adverse selection	Probit model	Mixed [1]	The study does not control for the quality of care.
Jowett et al. (2003)	Vietnam	Vietnam' s voluntary insurance	Gov't	1999	20% of individu-als	OOP pay-ment	Heckman, OLS	Sig. neg. effect	The paper addresses scheme self-selection bias using cross-section data.
Jutting (2003)	Senegal	Les mutu-elles de santé	Com'ty	2000	37.4 to 90.3% of house-holds	Social exclusion	Probit Model	Sig. pos. effect	The study pays limited attention to potential bias due to unobservable factors that may drive scheme up-take.
Jutting (2004)	Senegal	Les mutu-elles de santé	Com'ty	2000	30 000 individuals	OOP pay-ment	Log-linear	Sig. neg. effect	The study emphasises endogeniety and self-selection issues.
						Inpatient care	Logit model	Sig. pos. effect	
Lammers and Warmerdam (2010)	Nigeria	Health Insurance Fund (HIF)	Com'ty	2008	6% of the popula-tion	Social exclusion	Logit Model	Sig. pos. effect	Based on cross-section data. Conducts a sensitivity analysis.
						Adverse selection	Logit model	Sig. pos. effect	

Author(s)	Country	Scheme	Scheme Type	Year of study	Scheme coverage	Outcome variable	Method of analysis	Findings	Remarks
								effect	
Levine et al. (2012)	Cambo-dia	SKY Health Insurance	Com'ty	2007-2008	n/a	Utilization	IV, ITT	Sig. pos. effect	Randomised control and use of longitudinal house-hold data which includes baseline information
						OOP pay-ment	IV, ITT	Sig. neg. effect	

Author(s)	*Country*	*Scheme*	*Scheme Type*	*Year study*	*of Scheme coverage*	*Outcome variable*	*Method of analysis*	*Findings*	*Remarks*
Liu et al. (2012)	China	NCMS	Gov't	2006	85 to 91.3 % of the population	Outpatient care	Descriptive s	No effect	
						Inpatient care	Descriptive statistics	Sig. pos. effect	
	Vietnam	CHI, VHI	Gov't	2006	49.4 to 52.7 % of the population	Outpatient care	Descriptive statistics	Sig. pos. effect	
						Inpatient care	Descriptive statistics	Sig. pos. effect	
Lu et al. (2012)	Rwanda	Mutuelles	Gov't	2000-2008	More than 90% of the population	Utilization	Random effects logit model, IV	Sig. pos. effect	The authors use panel data for child and maternal care analysis. They use pooled data for general population medical care utilization and catastrophic health spending analysis. Matching is used to control for self-selection bias in insurance uptake and endogenous household expenditure while examining financial risk protection.
						Catastrophic OOP payment	IV, Logit model	Sig. neg. effect	
Msuya et al. (2007)	Tanzania	Iguga district	Gov't	2000	n/a	Social exclusion	Probit model	Sig. pos. effect	The conclusions are based on one regression per outcome variable. No sen

Author(s)	Country	Scheme	Scheme Type	Year of study	Scheme coverage	Outcome variable	Method of analysis	Findings	Remarks
		health insurance fund				Utilization	Probit model	Sig. pos. effect	sitivity analysis. Does not deal with self-selection issues.
Nguyen et al. (2011)	Ghana	NHIS	Gov't	2007	45 % of the population	OOP payment	Two part model (Probit + log-linear)	Sig. neg. effect[1]	No attention is paid to self-selection bias in insurance uptake.
						Catastrophic OOP payment	Probit model	Sig. neg. effect	
Noterman et al. (1995)	De Congo	Masisi referral hospital	Provider	1987-1990	26.8% of the population	Inpatient care	Simple descriptive	Increase in hospital admission[2]	The study uses an experimental approach. Ho the program was not implemented randomly eligible households, there is evidence of a selection.

[1] The effect of the scheme on OOP payment is only significant at 10 percent and the magnitude is small (reduction in health expenditure is equal to 1.25 percent of non-food household consumption).

[2] Hospital admission among subscribers increased by 157 percent and among non-subscribers increased by 31 percent between 1987 to 1988, the first period of the prepayment experiment.

Author(s)	*Country*	*Scheme*	*Scheme Type*	*Year of study*	*Scheme coverage*	*Outcome Variable*	*Method of analysis*	*Findin*	*Remarks*
Onwujekwe et al. (2009)	Nigeria	Anambra state CBHIs	Gov't	n/a	n/a	Social exclusion	Descriptive statistics	No effect	The SES of the respondents is not properly defined.
Parmar et al. (2012)	Burkina Faso	Assurance maladie à base communautaire	Com'ty	2004-2007	n/a	Adverse selection	Fixed effects	Mixed [1]	The study uses panel data to examine adverse selection overtime.
Ranson (2002)	India	Women's Association's Medical Insurance Fund	Com'ty	1994-2000	23,214 individuals	Catastrophic OOP payment	Descriptive statistics	Reduced from 35.6 percent to 15.1 percent[2]	Paper is based on data from reimbursement claims submitted between 1994 and 2000.
Ranson et al. (2006)	India	Self-Employed Women's Association's (SEWA)	Com'ty	2003	103,000 individuals	Social exclusion	Simple descriptive	The scheme is inclusive[3].	The study uses well-argued measures of socio economic status in order to see the impact of the schemes across different income groups. However, it does not deal with self-selection issues.

[1] Adverse selection is detected only in 2007 mainly due to a subsidy premium offered to poor households.

[2] The share of claimants for whom health expenditure would have been catastrophic (more than 10 percent of annual household income)

[3] 32 percent of rural members and 40 percent of urban members are from the bottom 30th percentile of socioeconomic status.

Author(s)	*Country*	*Scheme*	*Scheme-Type*	*Year of study*	*Scheme coverage*	*Outcome variable*	*Method of analysis*	*Findings*	*Remarks*
Rao et al. (2009)	Afghanistan	Parwan and Saripul Community Health Funds	Gov't	2004 & 2006	1 to 38 % of households	Outpatient	Simple descri tive	CBHI members use more care[1]	This study uses longitudinal data with baseline information. However, the paper applies descriptive analysis and does not control for differences between control and treatment groups.
						OOP payment	Descriptive st tistics	Increase in OOP payment	
Robyn et al. (2011)	Burkina Faso	Nouna District CBHI scheme	Com'ty	2007	8.6% of the population	Utilization	PSM	Sig. pos. effect	Despite the lack of panel data, the paper tries to deal with selection on observables.
Saksena et al. (2011)	Rwanda	Mutuelles	Gov't	2005-06	74% of the population	OOP payment	Ordered logit model	Sig neg. effect	The results are based on cross sectional data and there is no sensitivity analysis. Paper checks for endogeneity of enrolment using a Durbin-Wu-Hausman test, which is unable to reject exogeneity of enrolment.
						Catastrophic OOP payment	Simple descriptive	Reduces the risk of catastrophic health expenditure	
Schneider and Diop (2001)	Rwanda	Byumba, Kabgayi, and Kabutare prepayment plan pilot	Gov't	2000	6.1 to 10.6 of the popula tion	Utilization	Logit model	Sig pos. effect	The paper does not pay attention to endogeneity of enrolment. A single regression is estimated for each outcome variable.
						OOP payment	Log-linear	Sig neg. effect	
Sekyi and Domanban (2012)	Ghana	NHIS	Gov't	2008	More than 42 % of the population	Outpatient care	Logit model	Sig. pos. effect	Only limited set of number of individual and household level controls.

[1] CBHI members utilization constitutes from 29 to 90 percent of the total curative care utilization

Author(s)	*Country*	*Scheme*	*SchemeType*	*Year of study*	*Scheme coverage*	*Outcome Variable*	*Method of analysis*	*Findings*	*Remarks*
Senchanthixay (2005)	Lao	Sisattanak district CBHIs	Gov't	2004 & 2006	n/a	Outpatient care	Simple descriptive	Increase in outpatient visits by 52 percent	Simple mean comparisons (without any statistical test) are used. Does not control for difference in income and individual characteristics of insured and uninsured patients.
						Inpatient care	Simple descriptive	Decrease in inpatient care by 3.5 percent	
Shimeles (2010)	Rwanda	Mutuelles	Gov't	2005-06	85 % of the population	Social exclusion	Probit model	Sig. pos. effect	Despite the lack of longitudinal data, a range of methods are applied and the robustness of the findings are tested using alternative parametric regressions and propensity score matching techniques.
						Utilization	PSM, probit model	Sig. pos. effect	
						Catastrophic OOP payt.	PSM, probit model	Sig. neg. effect	
Sun et al. (2009)	China	Shandong province medical scheme	Gov't	2004	94.6% of the population	Catastrophic OOP payment	Simple descriptive	Decrease in catastrophic OOP payment	The study is based on comparing health exp. before and after reimbursement of insurance claims without any control group.
Wagstaff et al. (2009)	China	NCMS	Gov't	2003 & 2005	406 millio individual:	Outpatient care	DID with PSM	Sig. pos. effect	The study is based on household surveys before and after the intervention from treatment and control sites.
						OOP payment	DID with PSM	No effect	

Author(s)	Country	Scheme	Scheme Type	Year of study	Scheme coverage	Outcome Variable	Method of analysis	Findings	Remarks
Wang et al. (2005)	China	Fengshan Township CBI	Gov't	2002	n/a	Social exclusion	Logit model and OLS	Sig. pos. effect	
						Adverse selection	Logit model and OLS	Sig. pos. effect	
Xuemei and Xiao (2011)	China	NCMS	Gov't	1991-2006	n/a	Utilization	Fixed effects, IV, Logit model	No effect[1]	This study uses six years of panel data, before and after NCMS implementation.
Yip et al. (2008)	China	Rural Mutual Health Care (RMCH)	Com'ty	2002&2005	60000 individuals	Outpatient care	DID, PSM	Sig. pos. effect	The paper uses appropriate methods and data from longitudinal household surveys canvassed before and after the intervention from both treatment and control groups.
						Inpatient care	DID, PSM	No effect	
Zhang and Wang (2008)	China	Fengsan Township CBHI scheme	Com'ty	2002 - 2006	n/a	Social exclusion	DID	Sig. pos. effect	The results are based on a 4-year longitudinal survey. Random effect logit models are used to control for potential sources of bias.
						Adverse selection	DID	Sig. pos. effect	

[1] The paper finds that enrolment in insurance does not increase either the probability of visiting doctors or utilization of preventive health services.

Table A3
Clinical Vignettes

1. **Vignette 1: A 3 month old baby, who has always been healthy and playful, has been coughing quite a lot in the last few days and is breathing rapidly. The baby has difficulty sleeping because of this cough.**

   1a. What would you do? (**code 1**) [If 11 go to 1c]

   1b. When would you take the baby to this facility? (**code 2**)

   [if 1 or 2 go to question 2a]

2. **Vignette 2: A 1 year old girl, generally in good health, has diarrhea for 3 days now. She is still drinking some fluids, but since this morning, she's feeling sleepy and doesn't want to play.**

   2a. What would you do? (**code 1**) [If 11 go to 3]

   2b. When would you take the girl to this facility? (**code 2**)

3. **Vignette 3: A 20 year old male has always been healthy. For the last week, he has episodes of sudden coldness followed by rigor and then fever and sweating. These episodes occur about every two days. In** This is for total out of pocket payment. The programme significantly reduces OOP payment for deliveries and increases expenditure for outpatient visits and inpatient care. **between episodes he can still do some light housework.**

   3a. What would you do? (**code 1**) [If 11 go to 4]

   3b. When would you go to this facility? (**code 2**)

4. **Vignette 4: A 25 year old male has got a small cut in his leg when working on the field three days ago. The wound has become red and from time to time he feels a throbbing pain in his leg, but he can still walk around and do some work.**

   4a. What would you do? (**code 1**) [If 11 go to 5]

   4b. When would you go to this facility? (**code 2**)

5. **Vignette 5: A 35 year old female has been coughing for three weeks now. She feels more tired than usual but can still do some housework. Her relatives think she looks thinner than a few weeks ago.**

   5a. What would you do? (**code 1**)

   5b. When would you go to this facility? (**code 2**)

Code 1

1=go to Health post
2=go to Health centre
3=go to Private clinic
4=go to Mission/NGO clinic
5=go to Public hospital
6=go to Private hospital
7=go to Mission/NGO hospital
8=go to Pharmacy/drug store
9=go to religious healer
10= go to traditional healer
11=do nothing

Code 2

1=immediately
2=the next day if symptoms continue
3=after two days if symptoms continue
4=between three days and a week if symptoms continue
5=after a week if symptoms continue
6=after more than a week if symptoms continue

Table A4.1
Description of explanatory variables

Variable	*Description*
Socioeconomic status	
Consumption quintiles	Classification of households based on monthly household consumption expenditure (in ETB) excluding health care spending (poorest quintile, 2nd quintile, 3rd quintile, 4th quintile, richest quintile)
HH head education	Education level of the household head (no education at all, informal education, primary or above)
Participated in PSNP	Household participated or still participates in productive safety net programme, PSNP (1=yes)
Demographic traits	
Male headed hhd.	Made headed household (1= yes)
Age of hhd. head	Age of the household head (in completed years)
Household size	Number of household members
Prop. of children aged under 6	Proportion of children in the household aged under 6 years old
Prop. of male aged 6 to 15	Proportion of males in the household aged between 6 to 15 years old
Prop. of female aged 6 to 15	Proportion of females in the household aged between 6 to 15 years old
Prop. of male aged 16 to 64	Proportion of males in the household aged between 16 to 64 years old
Prop. of female aged 16 to 64	Proportion of females in the household aged between 16 to 64 years old
Prop. of elderly aged above 64	Proportion of elderly in the household aged above 64 years old
HH head religion	The religion of the household head (Orthodox Christian, Protestant, Muslim, other religion or no religion)
Health status and health care use	
Prop. of hhd members with good SAH	Proportion of household members aged 6 years and above with good self-assessed health status (based on the perception of the respondent to the household survey)
Prop. of hhd members with fair SAH	Proportion of household members aged 6 years and above with fair self-assessed health status (based on the perception of the respondent to the household survey)
Prop. of hhd members with low SAH	Proportion of household members aged 6 years and above with low self-assessed health status (based on the perception of the

Variable	*Description*
	respondent to the household survey)
Past illness event	Household, total number of days ill past two months
Chronic disease	Number of household members aged 6 and above years who suffered from a chronic disease (symptoms have been going on for more than 30 days)
Outpatient care use	At least one household member used outpatient care in the past two months (1= yes)
Inpatient care use	At least one household member used inpatient care in the past twelve months (1= yes)
Duration of hospitalization cases	Household, number of days spent in health facility in the past twelve months
Outpatient healthcare expenditure	Household's health care spending (in ETB) for outpatient care in the past two months
Inpatient healthcare expenditure	Household's health care spending (in ETB) for inpatient care in the past twelve months
Trust in modern heath care	Modern health care providers can be trusted more than traditional healers (perception of the respondent to the household survey) (agree, neither agree nor disagree, disagree)
Formal and informal access to credit and networks	
Member of *Iqqub*	At least one household member participates in an *Iqqub* association (1=yes)
Member of credit & savings ass.	At least one household member participates in credit & savings association (1=yes)
Member of religious group	At least one household member participates in a religious group (1=yes)
Participates in *Wonfel* or *Debo*	At least one household member participates in *Wonfel* or *Debo* (1=yes)
Savings in bank account	At least one household member has savings in a bank account (1=yes)
Outstanding loan	The household has an outstanding loan (1=yes)
Some one to rely on	The household has someone to rely on at times of shock (1=yes)
Official position held	At least one household member held or still holds official, kebele, or traditional position (1=yes)
Supply side characteristics	
Travel time to health centre	Travel time to the nearest health centre (in minutes)
Travel time to public hospital	Travel time to the nearest public hospital (in minutes)
Completed first degree (12+3)	Head of the facility has at least completed a first medical degree (12+3) (1=yes)
Received on the job	Head of the facility received on the job training (1=yes)

Variable	Description
training	
Availability of blood testing equipment	The health facility has blood testing equipment (1=yes)
Availability of urine testing equipment	The health facility has urine testing equipment (1=yes)
Waiting time to get patient card	Average waiting time (in minutes) before getting patient card (based on the response of five patients interviewed after getting medical treatment from the health facility)
Waiting time to see a medical professional	Average waiting time (in minutes) to see a medical professional (Doctor, nurse) (based on the response of five patients interviewed after getting medical treatment from the health facility)
Perceived quality of care	Perception of the respondent (typically the head of the facility) about the overall quality of health care services provided by the facility (1=yes, the facility provides quality services)
Community characteristics	
Region	The region where the household is located (Tigray Region, Amhara Region, Oromiya Region, Southern Nations Nationalities and People's Region /SNNPR)
Travel time to all weather road	Travel time to the nearest all weather road (in minutes)
Travel time to asphalt road	Travel time to the nearest asphalt road (in minutes)
Access to improved water	The household has access to improved water from pipe to home, public tap, borehole in residence, public borehole or protected spring (1=yes)
Access to modern light	The household has access to light from electricity, generator or solar (1=yes)
Radio use	The household members use radio at least sometimes in a year (1=yes)
Mobile phone use	The household members use mobile at least sometimes in a year (1=yes)

Table A4.2
Characteristics of target households per pilot region, 2011

Variable	*Tigray*		*Amhara*		*Oromiya*		*SNNPR*	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Socioeconomic status								
Poorest consumption quintile	0.18	0.38	0.20	0.40	0.04	0.20	0.38	0.49
2nd consumption quintile	0.24	0.43	0.24	0.42	0.11	0.31	0.22	0.41
3rd consumption quintile	0.23	0.42	0.22	0.41	0.22	0.41	0.13	0.34
4th consumption quintile	0.17	0.37	0.22	0.42	0.28	0.45	0.13	0.34
Richest consumption quintile	0.19	0.39	0.13	0.33	0.35	0.48	0.13	0.34
HH head education- No education at all	0.56	0.50	0.46	0.50	0.45	0.50	0.38	0.49
HH head education - Informal	0.09	0.29	0.23	0.42	0.17	0.37	0.04	0.19
HH head education - Primary or above	0.35	0.48	0.31	0.46	0.39	0.49	0.58	0.49
Participates in PSNP	0.58	0.49	0.06	0.24	0.05	0.22	0.16	0.37
Demographic traits								
Male headed HH	0.77	0.42	0.92	0.28	0.90	0.30	0.88	0.33
Age of HH head	47.89	14.81	47.00	13.59	45.38	13.31	47.07	14.02
Household size	5.32	2.47	5.67	2.08	5.97	2.08	6.51	2.25
Prop. of children aged under 6	0.15	0.16	0.14	0.14	0.15	0.16	0.12	0.14
Prop. of male aged 6 to 15	0.14	0.15	0.14	0.14	0.18	0.15	0.16	0.15
Prop. of female aged 6 to 15	0.14	0.15	0.15	0.15	0.15	0.14	0.16	0.15
Prop. of male aged 16 to 64	0.23	0.19	0.26	0.14	0.24	0.14	0.27	0.15

Variable	Tigray		Amhara		Oromiya		SNNPR	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Prop. of female aged 16 to 64	0.26	0.18	0.26	0.14	0.24	0.13	0.26	0.14
Prop. of elderly aged above 64	0.08	0.21	0.05	0.14	0.04	0.13	0.04	0.11
HH head religion - Orthodox Christian	0.98	0.13	0.66	0.47	0.65	0.48	0.13	0.33
HH head religion - Protestant	0.00	0.00	0.00	0.00	0.02	0.15	0.76	0.43
HH head religion - Muslim	0.02	0.13	0.34	0.47	0.33	0.47	0.03	0.18
HH head religion - Other religion or no religion	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27
Health status and health care use								
Prop. of household members with good SAH	0.66	0.43	0.67	0.42	0.94	0.13	0.79	0.28
Prop. of household members with fair SAH	0.28	0.41	0.27	0.39	0.05	0.12	0.13	0.25
Prop. of household members with low SAH	0.06	0.19	0.05	0.16	0.01	0.06	0.07	0.14
Past illness event	6.59	13.49	8.43	13.89	5.40	10.92	15.51	22.82
Chronic illness	0.25	0.57	0.34	0.89	0.09	0.36	0.55	1.14
Outpatient care use	0.29	0.45	0.38	0.49	0.28	0.45	0.58	0.50
Inpatient care use	0.03	0.17	0.03	0.16	0.03	0.17	0.04	0.19
Duration of hospitalization cases	1.08	2.28	0.18	1.34	0.33	2.47	0.41	2.70
Outpatient healthcare expenditure	27.51	147.23	71.36	352.08	47.10	139.07	83.88	163.37

Variable	*Tigray*		*Amhara*		*Oromiya*		*SNNPR*	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Inpatient healthcare expenditure	21.81	172.22	25.51	205.63	70.81	731.16	50.86	396.92
Trust in modern care – Disagree	0.11	0.31	0.04	0.19	0.04	0.20	0.04	0.19
Trust in modern care - Neither agree nor disagree	0.07	0.26	0.03	0.16	0.04	0.20	0.07	0.25
Trust in modern care – Agree	0.82	0.38	0.93	0.25	0.92	0.28	0.90	0.31
Formal and informal access to credit and networks								
Member of *Iqqub*	0.04	0.20	0.08	0.26	0.09	0.29	0.06	0.24
Member of credit & savings ass.	0.02	0.15	0.26	0.44	0.10	0.31	0.10	0.31
Member of religious group	0.75	0.43	0.58	0.50	0.42	0.49	0.63	0.48
Participate in *Wonfel* or *Debo*	0.39	0.49	0.79	0.41	0.49	0.50	0.10	0.29
Savings in bank account	0.14	0.35	0.26	0.44	0.08	0.28	0.06	0.24
Outstanding loan	0.39	0.49	0.32	0.47	0.17	0.38	0.40	0.49
Some one to rely on	0.36	0.48	0.51	0.50	0.47	0.50	0.20	0.40
Official position held	0.19	0.39	0.37	0.48	0.21	0.41	0.16	0.36
Supply side characteristics								
Travel time to health centre	74.57	54.90	74.09	50.42	67.62	35.32	49.48	29.45
Travel time to public hospital	151.94	94.98	123.68	60.99	98.38	50.15	82.50	51.34
Completed first degree (12+3)	0.72	0.45	0.39	0.49	0.56	0.50	0.17	0.37
Received on the job training	0.56	0.50	0.72	0.45	1.00	0.00	1.00	0.00

Variable	Tigray		Amhara		Oromiya		SNNPR	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Availability of blood testing equipment	0.78	0.42	1.00	0.00	0.67	0.47	0.89	0.31
Availability of urine testing equipment	0.78	0.42	0.83	0.37	1.00	0.00	1.00	0.00
Waiting time to get patient card	19.58	13.83	13.19	13.38	7.03	3.82	12.16	9.72
Waiting time to see a medical professional	57.78	35.38	38.83	25.22	15.37	8.56	25.74	11.57
Perceived quality of care	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Community characteristics								
Travel time to all weather road	26.84	28.11	48.69	46.77	43.31	34.34	30.68	36.62
Travel time to asphalt road	79.22	66.02	72.57	54.19	90.54	50.11	74.75	64.29
Access to improved water	0.84	0.37	0.80	0.40	0.62	0.49	0.75	0.43
Access to modern light	0.07	0.25	0.03	0.17	0.04	0.19	0.05	0.21
Radio use	0.47	0.50	0.86	0.35	0.72	0.45	0.82	0.39
Mobile phone use	0.33	0.47	0.52	0.50	0.38	0.49	0.37	0.48
Observations	306		306		306		306	

Table A5.1
Descriptive statistics at baseline, 2011, Mean (Std. Dev.)

Variables	*Insured hhds in CBHI districts (N=489)*	*Non-Insured hhds in CBHI districts (N=714)*	*P-value H_0: (1=2)*	*Non-Insured hhds in non-CBHI districts (N=429)*	*P-value H_0: (1=4)*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Characteristics of the head					
Male headed hh.	0.90	0.85	0.0108	0.843	0.0190
	(0.306)	(0.362)		(0.364)	
Age of hh. head	46.91	46.79	0.8860	44.40	0.0053
	(12.68)	(14.75)		(14.14)	
No education at all	0.424	0.484	0.0387	0.483	0.0790
	(0.495)	(0.50)		(0.50)	
Informal education	0.16	0.11	0.0214	0.125	0.1394
	(0.367)	(0.318)		(0.331)	
Primary or above primary education	0.42	0.401	0.6313	0.392	0.4856
	(0.49)	(0.491)		(0.489)	
Household size	6.25	5.61	0.0000	5.58	0.0000
	(2.211)	(2.264)		(2.105)	
Household composition (share)					
Share of children aged under 6	0.13	0.15	0.0669	0.176	0.0000
	(0.136)	(0.160)		(0.171)	
Share of male aged 6 to 15	0.165	0.149	0.0766	0.159	0.5297
	(0.147)	(0.154)		(0.159)	
Share of female aged 6 to 15	0.162	0.141	0.0108	0.145	0.0821
	(0.144)	(0.147)		(0.157)	
Share of male aged 16 to 64	0.255	0.247	0.4008	0.230	0.0126

Variables	*Insured hhds in CBHI districts (N=489)*	*Non-Insured hhds in CBHI districts (N=714)*	*P-value H_0: (1=2)*	*Non-Insured hhds in non-CBHI districts (N=429)*	*P-value H_0: (1=4)*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
	(0.147)	(0.167)		(0.159)	
Share of female aged 16 to 64	0.253	0.256	0.7691	0.248	0.5596
	(0.136)	(0.156)		(0.151)	
Share of elderly aged above 64	0.034	0.061	0.0029	0.044	0.2613
	(0.108)	(0.176)		(0.137)	
Self-assessed health status (SAH) – share of household					
Share of household with good SAH	0.81	0.74	0.0015	0.857	0.0126
	(0.317)	(0.376)		(0.288)	
Share of household with fair SAH	0.147	0.207	0.0016	0.117	0.1093
	(0.286)	(0.352)		(0.272)	
Share of household with low SAH	0.046	0.052	0.4860	0.024	0.0082
	(0.128)	(0.158)		(0.109)	
Illness days ratio	1.61	1.90	0.2028	1.40	0.3368
	(3.41)	(4.25)		(2.92)	
Consumption quintiles					
Poorest quintile	0.220	0.177	0.0662	0.216	0.8870
	(0.415)	(0.382)		(0.412)	
2nd quintile	0.202	0.194	0.7424	0.209	0.7910
	(0.402)	(0.396)		(0.407)	
3rd quintile	0.204	0.225	0.3684	0.150	0.0367
	(0.403)	(0.418)		(0.357)	
4th quintile	0.183	0.212	0.2220	0.199	0.5475
	(0.387)	(0.409)		(0.340)	
Richest quintile	0.191	0.191	0.9965	0.227	0.2032
	(0.394)	(0.393)		(0.418)	

Variables	*Insured hhds in CBHI districts (N=489)*	*Non-Insured hhds in CBHI districts (N=714)*	*P-value H_0: (1=2)*	*Non-Insured hhds in non-CBHI districts (N=429)*	*P-value H_0: (1=4)*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Participated in PSNP	0.28	0.17	0.0000	0.39	0.0000
	(0.45)	(0.38)		(0.49)	
Trust in modern heath care					
Disagree	0.055	0.058	0.8683	0.165	0.0000
	(0.229)	(0.233)		(0.371)	
Neither agree nor disagree	0.043	0.058	0.2621	0.093	0.0024
	(0.203)	(0.233)		(0.291)	
Agree	0.902	0.885	0.3564	0.742	0.0000
	(0.298)	(0.319)		(0.902)	
Access to public infrastructure					
Travel time to the nearest health centre (in minutes)	70.00	64.07	0.0235	59.30	0.0002
	(43.37)	(43.37)		(37.69)	
Travel time to the nearest public hospital (in minutes)	113.58	114.44	0.8373	100.33	0.0012
	(65.83)	(75.51)		(53.88)	
Travel time to the nearest asphalt road (in minutes)	80.31	78.58	0.6193	58.51	0.0000
	(53.09)	(63.20)		(48.04)	
Travel time to the nearest all weather road (in minutes)	34.79	32.91	0.3718	27.91	0.0000
	(33.69)	(35.35)		(31.22)	
Access to improved water	0.783	0.731	0.0369	0.865	0.0014
	(0.412)	(0.444)		(0.342)	
Access to modern light	0.047	0.042	0.6892	0.162	0.0000
	(0.212)	(0.202)		(0.369)	

Variables	*Insured hhds in CBHI districts (N=489)*	*Non-Insured hhds in CBHI districts (N=714)*	*P-value H_0: (1=2)*	*Non-Insured hhds in non-CBHI districts (N=429)*	*P-value H_0: (1=4)*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Radio use	0.744	0.697	0.0696	0.828	0.0023
	(0.437)	(0.437)		(0.377)	
Mobile phone use	0.419	0.392	0.3391	0.559	0.0000
	(0.494)	(0.489)		(0.497)	
Characteristics of health facility					
Share of heads who have completed first degree (12+3)	0.45	0.464	0.6293	0.625	0.0000
	(0.498)	(0.499)		(0.485)	
Share of the heads who have completed diploma (10+3)	0.55	0.536	0.6293	0.375	0.0000
	(0.498)	(0.499)		(0.485)	
Share of who have undertaken job training	0.81	0.826	0.4754	0.75	0.0306
	(0.393)	(0.379)		(0.434)	
Share of health facilities with blood testing equipment	0.924	0.772	0.0000	0.917	0.6723
	(0.265)	(0.419)		(0.277)	
Share of health facilities with urine testing equipment	0.939	0.879	0.0005	0.917	0.2032
	(0.240)	(0.326)		(0.277)	
Average waiting time before getting patient card	10.56	14.60	0.0000	11.24	0.2451
	(10.06)	(12.59)		(5.70)	
Average waiting time to see healthcare professional	28.33	38.48	0.0000	28.375	0.9747
	(23.97)	(29.42)		(11.47)	
The share of health facilities which were consid-	0.652	0.399	0.0000	0.708	0.0741

Variables	*Insured hhds in CBHI districts (N=489)*	*Non-Insured hhds in CBHI districts (N=714)*	*P-value H_0: (1=2)*	*Non-Insured hhds in non-CBHI districts (N=429)*	*P-value H_0: (1=4)*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
ered as providing high quality care					
	(0.478)	(0.489)		(0.455)	
Someone to rely on in case of shock	0.403	0.372	0.2846	0. 370	0.3165
	(0.491)	(0.484)		(0.483)	
Religion of the head					
Muslim	0.190	0.171	0.4022	0.522	0.0000
	(0.393)	(0.377)		(0.501)	
Orthodox Christian	0.622	0.595	0.3421	0.25	0.0000
	(0.485)	(0.491)		(0.446)	
Protestant	0.178	0.208	0.1920	0.186	0.7468
	(0.383)	(0.406)		(0.390)	
Other religion or no religion	0.010	0.026	0.0535	0. 042	0.0024
	(0.101)	(0.159)		(0. 200)	
Regions					
Tigray	0.207	0.279	0.0042	0.25	0.1217
	(0.405)	(0.449)		(0.434)	
Amhara	0.303	0.215	0.0005	0.25	0.0800
	(0. 460)	(0. 411)		(0.434)	
Oromiya	0.272	0.235	0.1476	0.25	0.4565
	(0.445)	(0. 424)		(0.434)	
SNNPR	0.219	0.271	0.0399	0.25	0.2717
	(0.414)	(0.447)		(0.434)	
Number of observations	*489*	*735*		*408*	

Table A5.2

Probability of joining the pilot scheme (marginal effects after logit, only for households in the CBHI districts)

Variables	*Marginal effects (Std. Err.)*	Variables	*Marginal effects (Std. Err.)*
Household head characteristics		Access to public infrastructure	
Male headed hh.	0.0326	Travel time to the nearest health centre (in minutes)	0.000755*
	(0.0493)		(0.000415)
Age of hh. head	0.000743	Travel time to the nearest public hospital (in minutes)	0.000298
	(0.00181)		(0.000422)
Head has informal education	0.0390	Travel time to the nearest all weather road (in minutes)	-0.000216
	(0.0525)		(0.000575)
Head has primary or above education	0.0758*	Travel time to the nearest asphalt road (in minutes)	-7.27e-05
	(0.0455)		(0.000527)
		Access to improved water	0.0341
Household size	0.0299***		(0.0365)
	(0.0106)	Access to modern light	-0.0509
HH composition (ref: Share of male aged 16 to 64)			(0.0700)
Share of children aged under 6	-0.122	Radio use	-0.0234
	(0.176)		(0.0377)
Share of male aged 6 to 15	-0.0271	Mobile phone use	0.0337
	(0.169)		(0.0378)
Share of female aged 6 to 15	0.0834	Characteristics of health facility	
	(0.173)	Share of heads of facilities who have degree (ref: head has diploma)	-0.0905
Share of female aged 16 to 64	0.0276		(0.0762)
	(0.203)	Head of the facility has undertaken on-the-job training	-0.101
Share of elderly aged above 64	-0.252		(0.0977)
	(0.173)	Has blood testing equipment	0.291***

Health status of hh. members (ref: share of hh. members with good SAH)			(0.0631)
Share of household with fair SAH	-0.0660	Has urine testing equipment	-0.129
	(0.0612)		(0.114)
Share of household with low SAH	0.118	Average waiting time before getting patient card	-0.00169
	(0.114)		(0.00461)
Illness days ratio	0.00309	Average waiting time to see health professional	-0.00489**
	(0.00578)		(0.00215)
SES (Consumption quintiles, ref : Poorest quintile)		Health facilities which were considered as providing high quality care (ref: low quality care)	0.199***
2nd quintile	0.0359		(0.0653)
	(0.0512)	Religion of the head (ref: Muslim)	
3rd quintile	0.0440	Orthodox Christian	0.173**
	(0.0462)		(0.0754)
4th quintile	0.0624	Protestant	0.140
	(0.0518)		(0.107)
Richest quintile	0.0954	Other religion or no religion	-0.0839
	(0.0667)		(0.137)
Participated in PSNP	0.334***	Regions (ref: SNNPR)	
	(0.0639)		
Trust in modern heath care (ref: disagree)		Tigray	0.00167
Neither agree nor disagree	-0.0609		(0.128)
	(0.0783)	Amhara	0.245**
Agree	0.0821		(0.111)
	(0.0756)	Oromiya	0.229*
			(0.121)
Number of observations		*1,189*	
Pseudo R-squared		*0.1758*	
Log pseudo likelihood		*-660.336*	

Note: Outcome variable is CBHI enrolment status of the household in 2012. All control variables are for the baseline year; Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1.

Table A5.3
Inpatient care utilization by CBHI membership status (balanced panel)

Outcome variable	*CBHI pilot districts*						*Non-CBHI pilot districts*		
	Insured households (N= 569)			*Uninsured house-holds (N= 616)*			*(N= 384)*		
	2011	*2012*	*2013*	*2011*	*2012*	*2013*	*2011*	*2012*	*2013*
The share of households using inpatient care from modern providers	0.029	0.031	0.046	0.036	0.037	0.024	0.008	0.034	0.029
The share of households using inpatient care from public providers	0.025	0.023	0.026	0.029	0.032	0.015	0.005	0.005	0.016
The share of households used inpatient care from private providers	0.006	0.023	0.039	0.006	0.029	0.019	0.003	0.031	0.029

Notes: In 2011, a household is categorized under insured group if the household was insured in 2012 or in 2013. Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level. The figures refer to the use of inpatient care in the 12 months preceding the survey.

Table A5.4
The impact of CBHI on the probability of inpatient care utilization

Outcome variable	Fixed effects without covariates			Fixed effects with time varying covariates			Fixed effects after matching [a]		
	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Share of households using inpatient care from modern providers	0.00279	-0.0160	-0.00304	0.00227	-0.0159	-0.00317	0.00526	-0.0242	-0.00225
	(0.0126)	(0.0120)	(0.0113)	(0.0135)	(0.0131)	(0.0122)	(0.0133)	(0.0150)	(0.0119)
Share of households using inpatient care from public providers	0.00728	-0.00992	0.000918	0.00814	-0.00855	0.00239	0.00988	-0.0158	0.00216
	(0.0106)	(0.00977)	(0.00945)	(0.0113)	(0.0105)	(0.0101)	(0.0116)	(0.0116)	(0.0104)
Share of households using inpatient care from private providers	0.00241	-0.00506	0.000702	0.00106	-0.00492	-0.000511	0.00282	-0.0123	0.000114
	(0.0102)	(0.0106)	(0.00938)	(0.0109)	(0.0115)	(0.0100)	(0.0107)	(0.0135)	(0.00979)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	3,265	1,906	4,146

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is equal to one if at least one household member has used inpatient care in the twelve months preceding the survey; [a]Nearest neighbour matching was used to create a sample of treated and matched controls.

Table A5.5
The impact of CBHI on out-of-pocket spending for inpatient care

Outcome variable	Fixed effects without covariates			Fixed effects with time varying covariates			Fixed effects after matching [a]		
	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Consultation and medicine spending	-4.448	-20.51	-11.32	-6.571	-21.50	-12.29	3.833	1.083	-5.933
	(23.84)	(22.35)	(21.57)	(26.13)	(25.05)	(23.83)	(25.29)	(29.50)	(22.87)
Transport and other health care	-0.0126	-7.807	-2.763	-2.200	-6.697	-2.951	-1.550	-7.118	-3.277
	(7.405)	(7.807)	(6.763)	(8.322)	(8.777)	(7.547)	(8.584)	(10.09)	(7.783)
Total health spending	-4.461	-28.31	-14.08	-8.771	-28.20	-15.24	2.283	-6.035	-9.210
	(29.85)	(27.92)	(26.81)	(32.87)	(31.29)	(29.59)	(32.38)	(36.62)	(28.93)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	3,265	1,906	4,146

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; Outcome variable is household's health care payment (in ETB) for inpatient care in the twelve months preceding the survey; [a] Nearest neighbour matching was used to create a sample of treated and matched controls.

Table A5.6

The impact of CBHI on incidence of health spending if health spending is at least 5% of household monthly expenditure

Outcome variable	Fixed effects without covariates			Fixed effects with time varying co-variates			Fixed effects after matching [a]		
	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Consultation/medicine spending is at least 5% of household monthly expenditure	-0.0221	-0.0616***	-0.0411**	-0.0130	-0.0562**	-0.0351*	-0.00936	-0.0446	-0.0282
	(0.0212)	(0.0201)	(0.0191)	(0.0226)	(0.0222)	(0.0205)	(0.0217)	(0.0296)	(0.0201)
Transport/other health care related spending is at least 5% of household monthly expenditure	-0.00576	-0.00667	-0.00842	-0.00699	-0.00785	-0.00979	-0.00436	0.00567	-0.00646
	(0.0123)	(0.0109)	(0.0107)	(0.0133)	(0.0117)	(0.0113)	(0.0131)	(0.0158)	(0.0112)
Total health care spending is at least 5% of household monthly expenditure	-0.0232	-0.0579***	-0.0417**	-0.0164	-0.0540**	-0.0370*	-0.0124	-0.0318	-0.0301
	(0.0224)	(0.0207)	(0.0196)	(0.0241)	(0.0229)	(0.0213)	(0.0235)	(0.0297)	(0.0212)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	3,265	1,906	4,146

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Healthcare spending is for both inpatient and outpatient care services; [a] Nearest neighbour matching was used to create a sample of treated and matched controls.

Table A5.7
The impact of CBHI on incidence of health spending if health spending is at least 10% of household monthly expenditure

Outcome variable	Fixed effects without covariates			Fixed effects with time varying covariates			Fixed effects after matching [a]		
	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Consultation/medicine spending is at least 10% of household monthly expenditure	0.00172	-0.0148	-0.00674	0.00442	-0.0129	-0.00545	0.0112	-0.0151	-0.000341
	(0.0157)	(0.0163)	(0.0148)	(0.0165)	(0.0172)	(0.0155)	(0.0153)	(0.0224)	(0.0145)
Transport/other health care related spending is at least 10% of household monthly expenditure	-0.00417	-0.00386	-0.00622	-0.00411	-0.00475	-0.00677	-0.00318	-0.00199	-0.00532
	(0.00698)	(0.00718)	(0.00662)	(0.00741)	(0.00763)	(0.00694)	(0.00727)	(0.0106)	(0.00674)
Total health care spending is at least 10% of household monthly expenditure	-0.00462	-0.0232	-0.0145	-0.00328	-0.0214	-0.0143	0.00350	-0.0131	-0.00865
	(0.0167)	(0.0165)	(0.0152)	(0.0176)	(0.0177)	(0.0160)	(0.0166)	(0.0234)	(0.0153)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	3,265	1,906	4,146

Notes: Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; Healthcare spending is for both inpatient and outpatient care services; [a] Nearest neighbour matching was used to create a sample of treated and matched controls.

Table A5.8
Cost of healthcare care, balanced panel, conditional on health care use in all survey years Mean (Std. Dev.)

Outcome va iable	***CBHI pilot districts***						***Non-CBHI pilot districts***		
	Insured households			***Uninsured households***					
Outpa-tient care	***2011***	***2012***	***2013***	***2011***	***2012***	***2013***	***2011***	***2012***	***2013***
Modern care price	54.2	61.7	21.9	36.0	47.6	74.0	67.5	96.4	93.3
	(60.7)	(116.4)	(61.0)	(39.6)	(66.5)	(123.4)	(107.8)	(114.5)	(102. 4)
Number of observa-tions	57	45	49	37	49	45	23	23	23
Public care price	46.6	40.0	9.0	32.0	40.1	39.2	31.4	79.3	78.9
	(51.6)	(63.1)	(22.6)	(37.9)	(64.8)	(41.4)	(23.9)	(74.2)	(44.0)
Number of observa-tions	28	22	27	18	24	19	8	8	8

Note: There are no households that reported utilization of private care in all surveys. In 2011, a household is categorized under insured group if the household was insured in 2012 or in 2013. Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Cost of outpatient care is defined as a household's payment for health - consultation and medicine, in ETB, per outpatient visit in the two months preceding the survey.

Table A5.9

Cost of healthcare use, balanced panel, conditional on healthcare use in all survey years

Outcome variable	*Fixed effects without covariates*			*Fixed effects with time varying covariates*		
	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts	Control hh. from pilot districts	Control hh. from non-pilot districts	Control hh. from pilot and non-pilot districts
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Modern care price	-42.25***	-44.03**	-42.79***	-40.57**	-31.43	-37.93**
	(14.10)	(20.00)	(14.34)	(16.62)	(22.74)	(16.48)
Number of observations	282	240	351	271	234	339
Public care price	-22.64*	-34.41*	-33.21**	-21.65	-30.45*	-30.04**
	(13.14)	(18.67)	(13.79)	(14.52)	(16.35)	(13.85)
Number of observations	138	108	162	132	104	155

Notes: There are no households that reported utilization of private care in all surveys and there are no estimates for price of private care outcome. Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is defined as a household's payment for outpatient care per visit - consultation and medicine, in ETB, in the two months preceding the survey.

Table A5.10
Placebo test comparing change in outpatient care use between the two control groups

(Difference-in-difference, only for households in the balanced panel)

Outcome Variable	*Mean difference b/n years*		Outcome Variable	*Mean difference b/n years*	
	2011 & 2012	*2012 & 2013*		*2011 & 2012*	*2012 & 2013*
Share of households using outpatient care from modern providers	-0.0475	-0.0527	The share of households used outpatient care from public hospital	-0.00874	-0.0296**
	(0.0520)	(0.0425)		(0.0169)	(0.0146)
Share of households using outpatient care from public providers	-0.0364	-0.00681	No. of outpatient visits per hh. member to modern facility	-0.0219	-0.0175
	(0.0439)	(0.0392)		(0.0315)	(0.0291)
Share of households using outpatient care from private providers (clinic)	-0.0423	0.0235	No. of outpatient visits per hh. member to public facility	-0.00764	-0.0136
	(0.0394)	(0.0312)		(0.0235)	(0.0217)
Share of households using outpatient care from a health post (public)	0.00735	-0.0125	No. of outpatient visits per hh. member to private facility	-0.0285	0.00852
	(0.0147)	(0.0135)		(0.0217)	(0.0214)
Share of households using outpatient care from health centres (public)	-0.00135	-0.00806			
	(0.0369)	(0.0309)			

Note: Probability of using outpatient care is equal to one if at least one household member has used outpatient care in the two months preceding the survey. Intensity of outpatient care use is number of outpatient visits per household member in the two months preceding the survey; Robust standard errors in parentheses; **p<0.05.

Table A5.11
Placebo test comparing change in healthcare spending between the two control groups

(Difference-in-difference, only for households in the balanced panel)

Outcome Variable	Mean difference b/n years		Outcome Variable	Mean difference b/n years	
	2011 & 2012	2012 & 2013		2011 & 2012	2012 & 2013
Consultation and medicine spending for outpatient care	-11.66	-30.07	Consultation and medicine spending for inpatient care	-14.08	-25.78
	(17.54)	(22.39)		(22.59)	(28.07)
Transport and other health care related spending for outpatient care	-3.057	1.819	Transport and other health care related spending for inpatient care	-10.35	-5.959
	(3.984)	(5.345)		(6.898)	(17.24)
Total health spending for outpatient care	-14.71	-28.25	Total health spending for inpatient care	-24.42	-31.74
	(20.28)	(25.84)		(28.14)	(38.08)

Note: Outpatient health care spending is household's health care payment (in ETB) in the two months preceding the survey; Inpatient health care spending is household's health care payment (in ETB) in the twelve months preceding the survey; Standard errors in parentheses are clustered at the village level.

Table A5.12

Placebo test comparing change in healthcare spending as share of consumption expenditure between two control groups

(Difference-in-difference, only for households in the balanced panel)

Outcome Variable	*Mean difference b/n years*		Outcome Variable	*Mean difference b/n years*	
	2011 & 2012	*2012 & 2013*		*2011 & 2012*	*2012 & 2013*
Consultation/medicine spending as share of household monthly expenditure	-0.00709	-0.00577	Incidence of total health care spending is at least 5% of household monthly expenditure	-0.0716*	0.00496
	(0.00556)	(0.00470)		(0.0362)	(0.0305)
Transport/other health care related spending as share of household monthly expenditure	-0.00169	0.00151	Incidence of households where consultation/medicine spending is at least 10% of household monthly expenditure	-0.0269	-0.00849
	(0.00159)	(0.00185)		(0.0261)	(0.0181)
Total health care spending as share of household monthly expenditure	-0.00878	-0.00426	Incidence of households where transport/other health care related spending is at least 10% of household monthly expenditure	0.00424	-0.00945
	(0.00660)	(0.00587)		(0.00723)	(0.00850)
Incidence of households where consultation/medicine spending is at least 5% of household monthly expenditure	-0.0686*	-0.0121	Incidence of total health care spending is at least 10% of household monthly expenditure	-0.0276	-0.0147
	(0.0364)	(0.0293)		(0.0281)	(0.0206)
Incidence of households where transport/other health care related spending is at least 5% of household monthly expenditure	-0.0156	0.0187			
	(0.0153)	(0.0160)			

Note: Household healthcare expenditure is for both inpatient and outpatient care services and is expressed as a share of monthly household consumption expenditure; Catastrophic healthcare expenditure is equal to one if the monthly healthcare expenditure of the household is more than or equal to 5 (or 10)% of monthly household consumption expenditure; Robust standard errors in parentheses; * p<0.1.

Table A5.13
The impact of CBHI on the probability of outpatient care utilization (2011 and 2012 household panel)

Outcome variable	*Fixed effects without covariates*			*Fixed effects with time varying covariates*			*Fixed effects after matching* [a]		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Share of households using outpatient care from modern providers	0.0906**	0.0239	0.0668*	0.0928**	0.0323	0.0703*	0.0928**	-0.00968	0.0640
	(0.0427)	(0.0526)	(0.0401)	(0.0426)	(0.0600)	(0.0416)	(0.0426)	(0.0627)	(0.0417)
Share of households using outpatient care from public providers	0.0879**	0.0414	0.0713*	0.0882**	0.0520	0.0745*	0.0882**	0.0372	0.0713*
	(0.0407)	(0.0438)	(0.0375)	(0.0411)	(0.0478)	(0.0388)	(0.0411)	(0.0513)	(0.0389)
Share of households using outpatient care from private providers	0.0332	-0.00889	0.0182	0.0340	-0.0143	0.0155	0.0340	-0.0218	0.0116
	(0.0275)	(0.0412)	(0.0277)	(0.0288)	(0.0461)	(0.0290)	(0.0288)	(0.0510)	(0.0292)
Number of observations	2,406	1,770	3,198	2,338	1,667	3,052	2,338	1,291	2,967

Notes: Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is equal to one if at least one household member has used outpatient care in the two months preceding the survey; a Nearest neighbor matching was used to create a sample of treated and matched controls.

Table A5.14

The impact of CBHI on the probability of outpatient care utilization (2011 and 2013 household panel)

Outcome variable	*Fixed effects without covariates*			*Fixed effects with time varying covariates*			*Fixed effects after matching* [a]		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Share of households using outpatient care from modern providers	0.102**	0.0123	0.0673*	0.106**	-0.0144	0.0602	0.109**	-0.0303	0.0506
	(0.0399)	(0.0459)	(0.0364)	(0.0415)	(0.0489)	(0.0373)	(0.0416)	(0.0538)	(0.0371)
Share of households using outpatient care from public providers	0.130***	0.0954**	0.117***	0.137***	0.0652	0.108***	0.144***	0.0538	0.104***
	(0.0353)	(0.0426)	(0.0327)	(0.0366)	(0.0464)	(0.0334)	(0.0368)	(0.0498)	(0.0333)
Share of households using outpatient care from private providers	0.00949	-0.00377	0.00440	0.00202	0.00377	0.00545	0.00605	0.0207	0.00468
	(0.0265)	(0.0343)	(0.0234)	(0.0292)	(0.0410)	(0.0268)	(0.0294)	(0.0475)	(0.0278)
Number of observations	2,371	1,906	3,139	2,231	1,781	2,926	2,177	1,165	2,757

Notes: Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is equal to one if at least one household member has used outpatient care in the two months preceding the survey; a Nearest neighbor matching was used to create a sample of treated and matched controls.

Table A5.15
The impact of CBHI on the intensity of outpatient care utilization (2011 and 2012 household panel)

Outcome variable	*Fixed effects without co-variates*			*Fixed effects with time varying covariates*			*Fixed effects after matching* [a]		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
No. of outpatient visits per hh. member to modern facility	0.0927***	0.0640*	0.0824***	0.0942***	0.0818**	0.0862***	0.0942***	0.0617	0.0839***
	(0.0313)	(0.0325)	(0.0289)	(0.0319)	(0.0398)	(0.0307)	(0.0319)	(0.0421)	(0.0307)
No. of outpatient visits per hh. member to public facility	0.0717***	0.0542**	0.0654***	0.0766***	0.0662**	0.0705***	0.0766***	0.0695*	0.0698***
	(0.0238)	(0.0257)	(0.0225)	(0.0251)	(0.0302)	(0.0241)	(0.0251)	(0.0391)	(0.0242)
No. of outpatient visits per hh. member to private facility	0.0283	-0.000749	0.0180	0.0273	0.00239	0.0181	0.0273	-0.0176	0.0163
	(0.0186)	(0.0244)	(0.0185)	(0.0190)	(0.0303)	(0.0198)	(0.0190)	(0.0279)	(0.0198)
Number of observations	2,406	1,770	3,198	2,338	1,667	3,052	2,338	1,291	2,967

Notes: Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is number of outpatient visits per household member in the two months preceding the survey; a Nearest neighbor matching was used to create a sample of treated and matched controls.

Table A5.16
The impact of CBHI on the intensity of outpatient care utilization (2011 and 2013 household panel)

Outcome variable	*Fixed effects without co-variates*			*Fixed effects with time varying covariates*			*Fixed effects after matching* [a]		
	Control hh. from pilot districts	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*	*Control hh. from pilot districts*	*Control hh. from non-pilot districts*	*Control hh. from pilot and non-pilot districts*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
No. of outpatient visits per hh. member to modern facility	0.0632**	0.0340	0.0520**	0.0557*	-0.00375	0.0357	0.0627*	-0.0270	0.0335
	(0.0313)	(0.0305)	(0.0261)	(0.0328)	(0.0297)	(0.0269)	(0.0329)	(0.0345)	(0.0273)
No. of outpatient visits per hh. member to public facility	0.0680**	0.0487*	0.0606**	0.0663**	0.0135	0.0464**	0.0733***	-0.0124	0.0444*
	(0.0259)	(0.0283)	(0.0234)	(0.0262)	(0.0269)	(0.0231)	(0.0263)	(0.0302)	(0.0230)
No. of outpatient visits per hh. member to private facility	0.00803	-0.0108	0.000810	0.00288	-0.0124	-0.000429	0.00408	-0.00794	0.000534
	(0.0153)	(0.0156)	(0.0125)	(0.0158)	(0.0179)	(0.0135)	(0.0159)	(0.0215)	(0.0140)
Number of observations	2,371	1,906	3,139	2,231	1,781	2,926	2,177	1,165	2,757

Notes: Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; Outcome variable is number of outpatient visits per household member in the two months preceding the survey; a Nearest neighbor matching was used to create a sample of treated and matched controls.

Table A6.1
Description of selected explanatory variables

Variable	*Description*
Understanding of health insurance	
Only sick people buy CBHI	Only those who fall sick should consider buying HI/CBHI (1= if the respondent provides appropriate response)
CBHI is same as saving scheme	HI/CBHI programmes are like savings scheme, you will receive interest and get your money back (1= if the respondent provides appropriate response)
CBHI finances health care	In HI/CBHI programmes you pay money (premiums) in order for the HI/ CBHI to finance your future health care needs (1= if the respondent provides appropriate response)
CBHI premium can be returned	If you do not make claim any costs through HI/CBHI your premium will be returned (1= if the respondent provides appropriate response)
Health insurance understanding level	Composite variable constructed based on four questions measuring the respondent's knowledge of health insurance (low understanding if two or less than two questions correctly answered, medium understanding if three questions correctly answered, high understanding if four questions correctly answered)
Knowledge of & participation in CBHI scheme	
No of CBHI meetings attended before implementation	Number of CBHI related meetings/trainings attended by the respondent or any of her/his HH members before CBHI was implemented
Involved in CBHI management	Involvement of the respondent or any one of his/her household members in the administration and management of the CBHI scheme (1 = yes)
Official position held	At least one household member held or still holds official, *kebele*, or traditional position (1=yes)

Variable	*Description*
CBHI experience and design features	
CBHI agents solve problems	The local CBHI agent tries hard to solve CBHI implementation problems (1= if the respondent agrees)
Community guides CBHI administration	The community /CBHI members have the right to guide and supervise the activities of the CBHI administration (1= if the respondent agrees)
CBHI management is trust worthy	The local CBHI management is trustworthy (1= if the respondent agrees)
CBHI registration service	Satisfaction with the experience at the local CBHI office when you went to register (1= if the respondent is satisfied)
CBHI premium collection service	Satisfaction with the experience at the local CBHI office when you went to pay premium (1= if the respondent is satisfied)
Overall satisfaction with the scheme	Composite variable constructed using five indicators/questions measuring the satisfaction of the respondent on the CBHI experience and design feature of the schemes (low level if agreed/satisfied with less than two indicators, medium level if agreed/satisfied with two or three of the indicators, high level if agreed/satisfied with four or five indicators)
The timing of premium payment	The timing/time interval of premium payment is convenient for my household (1= if the respondent agrees)
CBHI registration fee	The CBHI registration fee is affordable for my household (1= if the respondent agrees)
CBHI premium	The CBHI regular contribution (premium) is affordable for my household (1= if the respondent agrees)
Capacity to afford for CBHI	Composite variable constructed using three indicators/questions measuring the capacity of the households to afford for CBHI (low level if the respondent agreed with one or no indicator, medium level if two indicators, high level if three indicators)
Access to & quality of care	

Variable	*Description*
Travel time to health centre	Travel time to the nearest health centre (in minutes)
Travel time to public hospital	Travel time to the nearest public hospital (in minutes)
Health workers favour insured patients	Health professionals treat patients with CBHI membership better than patients who are not members (disagree, neutral, agree)
Quality of care linked to CBHI	The quality of healthcare services provided under the CBHI scheme is good or excellent (1=yes)
Availability of blood testing equipment	The health facility has blood testing equipment (1=yes)
Waiting time to see a medical professional	Average waiting time (in minutes) to see a medical professional (Doctor, nurse) (based on the response of five patients interviewed after getting medical treatment from the health facility)

Table A6.2
Perception of CBHI experience and affordability

	Agree			*Neither agree nor disagree*			*Disagree*		
	Dropped - out	*Renewed*	*Total*	*Dropped - out*	*Renewed*	*Total*	*Dropped - out*	*Renewed*	*Total*
	N (%)	*N (%)*	*N (%)*	*N (%)*	*N (%)*	*N (%)*	*N (%)*	*N (%)*	*N (%)*
CBHI agents solve problems	44	252	296	30	87	117	12	54	66
	(51.2)	(64.1)	(61.8)	(34.9)	(22.1)	(24.4)	(14.0)	(13.7)	(13.8)
Community guides CBHI administration	35	206	241	37	118	155	14	70	84
	(40.7)	(52.3)	(50.2)	(43.0)	(30.0)	(32.3)	(16.3)	(17.8)	(17.5)
CBHI management is trust worthy	48	241	289	32	104	136	5	48	53
	(56.5)	(61.3)	(60.5)	(37.7)	(26.5)	(28.5)	(5.9)	(56.5)	(11.1)
The registration service of local CBHI is satisfactory	59	285	344	21	66	87	6	43	49
	(68.6)	(72.3)	(71.7)	(24.4)	(16.8)	(18.1)	(7.0)	(10.9)	(10.2)
The premium collection service of local CBHI office is satisfactory	59	286	345	19	59	78	6	40	46
	(70.2)	(74.3)	(73.6)	(22.6)	(15.3)	(16.6)	(7.1)	(10.4)	(9.8)
The timing/time interval of premium payment is convenient for my household	65	310	375	13	51	64	6	28	34
	(77.38)	(79.69)	(79.3)	(15.48)	(13.11)	(13.5)	(7.14)	(7.20)	(7.2)
The CBHI registration fee is affordable for my household	69	328	397	10	33	43	5	27	32
	(82.14)	(84.54)	(84.1)	(11.90)	(8.51)	(9.1)	(5.95)	(6.96)	(6.8)
The CBHI regular contribution (premium) is affordable for my household	64	297	361	13	53	66	7	38	45
	(76.19)	(76.55)	(76.5)	(15.48)	(13.66)	(9.5)	(8.33)	(9.79)	(9.5)

Table A6.3
Understanding of health insurance

	Correct response			Incorrect response			'I do not know' response		
	Dropped - out	Renewed	Total	Dropped - out	Renewed	Total	Dropped - out	Renewed	Total
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Only sick people buy CBHI	72	329	401	12	56	68	3	10	13
	(82.8)	(83.3)	(83.2)	(13.8)	(14.2)	(14.1)	(3.5)	(2.5)	(2.7)
CBHI is same as saving scheme	71	344	415	8	23	31	8	29	37
	(81.6)	(86.9)	(85.9)	(9.2)	(5.8)	(6.4)	(9.2)	(7.3)	(7.7)
CBHI finances health care	72	332	404	13	46	59	2	17	19
	(82.8)	(84.1)	(83.8)	(14.9)	(11.7)	(12.2)	(2.3)	(4.3)	(3.9)
CBHI premium can be returned	70	310	380	2	19	21	15	66	81
	(80.5)	(78.5)	(78.8)	(2.3)	(4.8)	(4.4)	(17.2)	(16.7)	(16.8)

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Declaration:

This thesis has not been submitted to any university for a degree or any other award.