International Institute of Social Studies

Working Paper
No. 578

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December 2013

ISSN 0921-0210

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

Anagaw Derseh[a], Robert Sparrow[b], Zelalem Yilma[c], Getnet Alemu[d], Arjun S. Bedi[e]

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 socioeconomic 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.

Keywords: Community based health insurance, adverse selection, social exclusion, Ethiopia

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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. 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 centers 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.[1] 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 (Nketiah-

[1] 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.

Amponsah, 2009; 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.

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.[2] 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 fulfill 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).[3]

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

[2] 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).

[3] 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 centers (4) Quality of health centers, (5) The implementation of cost recovery, local revenue retention, and public pharmacy policies in health centers.

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.[4] 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.[5] In order to reduce the possibility of adverse selection the unit of membership is the household rather than the individual (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

[4] 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

[5] 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.

Oromiya (see Table 1).[6] 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.[7] 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".[8]

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.[9] 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.

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

[7] 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.

[8] 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.

[9] 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.

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 copayments as long as members follow the scheme's referral procedure. When they seek care, scheme members are first expected to visit a health center and can subsequently access higher level care at district or regional hospitals as long as they have referral letters from the health center. 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 1) and according to Abt Associates uptake reached 45.5 percent in December 2012 (see Table 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).

3. Data

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*).[10] From each of the 16 sampled districts, 6 villages (*Kebeles*) were randomly chosen and within each village 17 households were randomly chosen to yield a total of 1,632 households. 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.[11]

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

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

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

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 member. 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 centers (3 randomly selected health centers from each of the 16 districts). We focused on health centers 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 center, 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 centers.[12]

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 conducted 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. Estimating the determinants of CBHI enrolment

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,

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

[12] On average about 41 households were matched to one health center.

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.[13] [14] *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*.[15] The strength of a household's social network is proxied, amongst other variables, by membership in a *Wonfel* or a *Debo*,

[13] 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.

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

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

membership in church/mosque based religious groups, and whether any household member has ever held or holds an official government position.[16]

We include two sets of supply side characteristics. One set, access to health care facilities (*SSA*) includes travel time to health centers 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.[17] 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 A1 and Table 3, respectively.

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. Table 5 contains information on the main reasons for purchasing insurance.

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

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

[17] '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 center is providing the expected standard of health care services, yes or no.

program reveals the opposite, with the poorest quintile providing the largest share of CBHI beneficiaries (Table 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.[18] 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 2, about 20 percent (8.9/45.5) of enrolled households in December 2012 were receiving a fee waiver.

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

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

out of 489) of insured households indicate that their main reason for joining the scheme is pressure from CBHI officials (Table 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 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 Birr, 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 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.[19]

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.

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

Turning to supply side factors, contrary to expectations, there is a positive association between travel time to health centers 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 center 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 behavior 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 unisured due to the paper work required to receive payments for insured patients and the payment lag.[20]

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

[20] 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.

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 A2, 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 country. 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 A2).

6. Conclusion

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 center 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 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.

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Table 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 Kuyu, Deder, and L. Kossa districts – annual or biannual	44
SNNPR	Household	ETB 10.50	ETB 2.10	Yirgalem and D. Woyde – quarterly Damboya - three times a year	35
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.

Table 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

Table 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
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* or *Debo*	0.46	0.50	0.43	0.50	0.3777	0.44	0.50
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 center	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

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

Table 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	0.000538
	(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)
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				0.000246**
				(9.59e-05)
Inpatient healthcare expenditure				-2.26e-05
				(2.36e-05)

VARIABLES	Model 1	Model 2	Model 3	Model 4
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
	(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 center	0.000807*	0.000857**	0.000847**	0.000834*
	(0.000418)	(0.000421)	(0.000422)	(0.000428)
Travel time to public hospital	0.000167	0.000164	0.000165	0.000207
	(0.000421)	(0.000426)	(0.000423)	(0.000423)
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)	(0.00467)	(0.00466)
Waiting time to see a medical professional	-0.00449**	-0.00462**	-0.00463**	-0.00445**
	(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

Table 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)

Table A1
Description of explanatory variables

Variable	Description
Socioeconomic status	
Consumption quintiles	Classification of households based on monthly household consumption expenditure (in Birr) 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 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 Birr) for outpatient care in the past two months
Inpatient healthcare expenditure	Household's health care spending (in Birr) 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 center	Travel time to the nearest health center (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 training	Head of the facility received on the job training (1=yes)
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

Variable	Description
	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 A2
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
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
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

Variable	Tigray		Amhara		Oromiya		SNNPR	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
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 center	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
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	