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

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Abstract

In recent years there has been a proliferation of Community Based Health Insurance (CBHI) schemes designed to enhance access to modern health care services and provide financial protection to workers in the informal and rural sectors. In June 2011, the Government of Ethiopia introduced a pilot CBHI scheme in rural parts of the country. This paper assesses the impact of the 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.

Keywords

Community based health insurance, outpatient healthcare utilization, out-of-pocket expenditure, Ethiopia.

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.[1] As a prelude to potential national level coverage, the Government of Ethiopia introduced a pilot Community Based Health Insurance scheme in June 2011. This voluntary CBHI scheme has been established in three districts (*woredas*) located in each of the four main regional states (*Amhara, Tigray, Oromiya* and *SNNPR*) and offers health insurance to about 300,000 households (about 1.8 million individuals). The aim of this paper 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

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[1] 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.

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.[2] These studies are labeled 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.

Mebratie et al. (2013) provide an updated systematic review which 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 Mebratie et al. (2013) 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 identify 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.

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[2] 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.

However, except for a handful of papers, the bulk of the CBHI evaluation literature is based on cross-section data does not account for such selection effects.[3] 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 key features of the CBHI scheme. Section 3 discusses data and the research methods. Section 4 contains estimates, while the final section provides a discussion and brings the paper to a close.

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[3] 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.

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.[4] 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).[5]

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 - benefit packages, registration fees, premium payments – was determined on the basis of feasibility studies and in collaboration with regional governments, and is the same within each of the pilot regions but differs 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.

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[4] 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 % of the country's population (Population Census Commission, 2008).

[5] 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.

While the scheme has been introduced by the government, it is 'community based' in the sense that the community at the village (*kebele*) level determines whether or not to join the scheme and is subsequently involved in scheme management and supervision. After being exposed to a range of awareness creation activities a general assembly at the village level decided whether or not to join the scheme (a simple majority had to support the decision) and then households decide whether to enroll in the scheme.[6] In order to reduce the possibility of adverse selection the unit of membership is the household rather than the individual (FMoH, 2008).

Household level monthly premiums for core household members range between ETB 10.50 in SNNPR to ETB 15 in Oromiya (see Table 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 3% 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% of the population or so called "indigent groups".[9]

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

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[6] All *kebeles* in the pilot districts voted in favour of the scheme.

[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 2013, the share of indigent groups as a proportion of the total eligible households (300,605 households) ranged from a low of 0.9 % in Deder district in Oromiya to 21.1 % in Tehulederie district in Amhara region. Nation-wide, by December 2013, 7.4 % of total eligible households had received a fee-waiver.

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. 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. 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 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% of their costs.[11]

According to our survey data, scheme uptake was 41% in April 2012 and reached 48% in April 2013 (see Table 2).[12] 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. Enrolment rates vary across regions, ranging from 35% in SNNPR in 2013 to 63% in the Amhara region. Compared to the experience of several other African countries the speed of uptake is relatively high. For instance, uptake in Mali was 11.4% after six years (Diop et al., 2006), 4.8% after two years in Senegal (Smith and Sulzbach, 2008), 2.8% in Tanzania after six years (Chee et al., 2002), 35% in Rwanda after seven years and 85% after nine years (Shimeles, 2010).

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[10] However, the qualitative survey has shown 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 was no regular meeting with the community to update members about the activities of the scheme and collect feedback.

[11] Access to tertiary level care differs across regions. In Amhara and Tigray, CBHI enrollees 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.

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

3. Data and methods

3.1 Data

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.

The surveys cover 16 districts located in four main regions of the country. Twelve of these districts are implementing the CBHI scheme while one district from each region is a non-pilot district.[13] As mentioned in section 2, districts were selected for piloting the scheme if they had implemented a cost recovery and local revenue retention programme and if they have health centers that are readily accessible. In each region, the non-pilot districts were also selected on the basis of complying with these two conditions. Within each district, 6 villages (*kebele*) were randomly selected and from each village 17 households were randomly selected from lists maintained by village administrative offices yielding a total of 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.

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) and village characteristics. The health module includes questions regarding 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

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[13] We do not include the district in *Oromiya* region that volunteered for the CBHI scheme.

while it is 12 months in the case of inpatient health care. Health expenditure including transport costs, consultation and diagnosis costs and drug costs for each episode of health care consumption are recorded. 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 services in determining enrollment and outcomes, information from the household surveys was combined with data 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 June 2011, 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 card and time taken between obtaining the patient card and consulting with a health care professional. Based on information obtained from the district health offices the sampled households living in 96 villages were matched to the 48 health centers on the basis of geographical proximity.

To gain a clearer understanding of scheme design, operation and implementation issues, 15 key informant interviews were conducted – three at federal, four at regional, four at district and four at the village level. Eight focus group discussions, two in each of four villages, were conducted with groups of 7 to 12 individuals. Per village, 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. In addition, both insured and non-insured households also discussed about the benefit of the scheme to their communities.

3.2 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 enrollees, access to tertiary level care, at least if reimbursement is desired, is contingent on being referred by health centers. 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 centers 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 centers, 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. Enrollment 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 enrollment, we exploit the longitudinal nature of the data at hand and estimate a household fixed-effect model,

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

where, y_{it} indicates the outcome of interest for household i at time t. T indicates the time period of the observation (2012 or 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 control for a range of time varying household and community level covariates (X_{it})[14]

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

Finally, we also use propensity score matching (nearest neighbor 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.[15]

We have two potential control groups – uninsured households in the pilot districts and uninsured households in the non-pilot districts. Since enrollment 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 enroll (spillover 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 spillover 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

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[14] The vector X_{it} includes education of household head, demographic composition of the household, time taken to reach the nearest health center, 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.

[15] 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.

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. 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.

4. Estimates

4.1 Who enrolls?

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 some evidence of greater similarity between households located in the same district as compared to those in a different district.[16] 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 enroll. 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 enrollment and that the key factors determining enrolment are quality of health care services and regional fixed-effects.[17] The lack of evidence from the enrollment 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

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[16] See Table A1 of the supplemental appendix.
[17] Results reported in Table A2 of the supplemental appendix.

access to better quality health care as such access may lead to greater health care usage regardless of CBHI enrollment.

4.2 Health care utilization

Trends in outpatient health care utilization by CBHI status are provided in Table 3. 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).[18] 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 centers 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.

Estimates of the effect of the CBHI scheme on outpatient care utilization, utilization by source and the intensity of use are provided in Tables 4, 5 and 6, respectively. 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 4, 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

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

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. 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.

As shown in Table 5, the entire increase in the probability of using publicly provided care comes from increased use of health centers. 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 centers 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 centers combined with a decline in the use of hospitals is consistent with the scheme design which creates incentives for patients to visit health centers before they try to access higher level care.

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 6, 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.

Unfortunately we were not able to assess the effects of CBHI on the utilization of inpatient care, due to limited variation in the outcome variables. We did estimate the

same models for inpatient care but the coefficients for CBHI participation are essentially zero, regardless of method and control group.[19] 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.

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 7, with estimates of the impact of the program on outpatient health care spending in Table 8. 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. Depending on the control group, the magnitude ranges from 11 to 27 Birr 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.

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 9 while estimates are in Tables 10. 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.[20]

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[19] Trends in utilization of inpatient care and estimates of the impact of CBHI on inpatient care utilization are provided in Tables A3 and A4 of the supplemental appendix.

[20] 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 A6 and A7 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).

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 11 while estimates (difference-in-differences) of the scheme on cost of care per visit are displayed in Table 12.[21] 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 12 indicate that the cost of care per visit to a public facility declines by about 35 to 54 Birr per visit. Compared to the baseline cost of 62 Birr per visit to a public facility these changes represent declines of between 56 to 87%.

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.

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

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[21] 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 12. 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 A8 and A9 of the supplemental appendix).

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.[22] 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. Discussion and concluding remarks

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

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[22] The test results are not presented here, but in Tables A10, A11 and A12 of the supplementary appendix.

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 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 enrollees 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 favor uninsured fee-paying patients.

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.

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Table 1
CBHI in Ethiopia – Premiums, payment intervals and enrollment

| Region | Unit of contribution | Premium per month | | Payment interval |
		Core household members*	Per extended family member	
Tigray	Household	ETB 11.00	ETB 2.50	Annual
Amhara	Individual	ETB 3.00	ETB 3.00	Biannual
Oromiya	Household	ETB 15.00	ETB 3.00	Gimbichu district - annual
				Kuyu, Deder, and L. Kossa districts – annual or biannual
SNNPR	Household	ETB 10.50	ETB 2.10	Yirgalem and D. Woyde – quarterly
				Damboya - three times a year

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.

Table 2
CBHI enrollment and drop-out in the pilot regions

| 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 enrollment status and five households were not resurveyed in 2013.
Source: The 2012 and 2013 poverty dynamics, health shocks and coping strategies in Ethiopia surveys.

Table 3
Outpatient care utilization by CBHI membership status (balanced panel)

Outcome variable	CBHI pilot districts						Non-CBHI pilot districts		
	Insured households (N= 569)			Uninsured households (N= 616)			(N=384)		
	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 centers (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.

Table 4
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 (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (6)	Control hh. from pilot districts (7)	Control hh. from non-pilot districts (8)	Control hh. from pilot and non-pilot districts (9)
Share of households using outpatient care from modern providers	0.101*** (0.0302)	0.0600** (0.0295)	0.0797*** (0.0280)	0.107*** (0.0305)	0.0580* (0.0310)	0.0787*** (0.0284)	0.104*** (0.0303)	0.0490 (0.0373)	0.0752*** (0.0281)
Share of households using outpatient care from public providers	0.108*** (0.0271)	0.0856*** (0.0274)	0.0985*** (0.0256)	0.114*** (0.0275)	0.0821*** (0.0284)	0.0983*** (0.0259)	0.110*** (0.0274)	0.0845** (0.0338)	0.0935*** (0.0255)
Share of households using outpatient care from private providers	0.0243 (0.0208)	0.00999 (0.0233)	0.0172 (0.0198)	0.0233 (0.0225)	0.00839 (0.0256)	0.0149 (0.0217)	0.0205 (0.0224)	0.0251 (0.0329)	0.0138 (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 neighbor matching was used to create a sample of treated and matched controls.

Table 5
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 (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (6)	Control hh. from pilot districts (7)	Control hh. from non-pilot districts (8)	Control hh. from pilot and non-pilot districts (9)
Share of households using outpatient care from a health post	0.0102 (0.0104)	0.0102 (0.0115)	0.00968 (0.00975)	0.00648 (0.0110)	0.00909 (0.0123)	0.00767 (0.0102)	0.00387 (0.0117)	0.00880 (0.0118)	0.00601 (0.0106)
Share of households using outpatient care from a health center	0.109*** (0.0220)	0.105*** (0.0237)	0.108*** (0.0213)	0.110*** (0.0212)	0.0995*** (0.0234)	0.106*** (0.0206)	0.104*** (0.0216)	0.0897*** (0.0300)	0.101*** (0.0201)
Share of households using outpatient care from a public hospital	-0.0178 (0.0120)	-0.0324*** (0.0106)	-0.0239** (0.0107)	-0.0117 (0.0124)	-0.0310*** (0.0113)	-0.0220* (0.0111)	-0.00688 (0.0129)	-0.0241* (0.0128)	-0.0209* (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 neighbor matching was used to create a sample of treated and matched controls.

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

Table 7
Healthcare expenditure by CBHI membership status (balanced panel), Mean (Std. Dev.)

Outcome variable	CBHI pilot districts						Non-CBHI pilot districts		
	Insured households (N= 569)			Uninsured households (N= 616)			(N= 384)		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Outpatient care									
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. Only households surveyed three times (in the baseline and the two follow up surveys) are used to produce the results. Outpatient health care spending is household's health care payment (in Birr) in the two months preceding the survey; Inpatient health care spending is household's health care payment (in Birr) in the twelve months preceding the survey; Standard errors in parentheses are clustered at the village level.

Table 8
The impact of CBHI on out-of-pocket spending for outpatient care

Outcome variable	Fixed effects without covariates			Fixed effects with time varying covariates			Fixed effects after matching [a]		
	Control hh. from pilot districts (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (6)	Control hh. from pilot districts (7)	Control hh. from non-pilot districts (8)	Control hh. from pilot and non-pilot districts (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 Birr) for 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 9

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

Outcome variable	CBHI pilot districts						Non-CBHI pilot districts		
	Insured households (N= 562)			Uninsured households (N= 605)			(N=383)		
	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
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 10
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 (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (6)	Control hh. from pilot districts (7)	Control hh. from non-pilot districts (8)	Control hh. from pilot and non-pilot districts (9)
Consultation/medicine spending as share of household monthly expenditure	-0.00299 (0.00343)	-0.00861** (0.00336)	-0.00586* (0.00320)	-0.00134 (0.00372)	-0.00803** (0.00361)	-0.00490 (0.00347)	-0.000220 (0.00350)	-0.00662 (0.00463)	-0.00404 (0.00334)
Transport/other health care related spending as share of household monthly expenditure	-0.00104 (0.00118)	-0.00131 (0.00109)	-0.00140 (0.00109)	-0.00101 (0.00127)	-0.00120 (0.00117)	-0.00143 (0.00116)	-0.000657 (0.00127)	0.000397 (0.00156)	-0.00125 (0.00118)
Total health care spending as share of household *monthly* expenditure	-0.00403 (0.00414)	-0.00992** (0.00404)	-0.00726* (0.00386)	-0.00235 (0.00449)	-0.00923** (0.00437)	-0.00633 (0.00418)	-0.000877 (0.00424)	-0.00622 (0.00559)	-0.00529 (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 neighbor matching was used to create a sample of treated and matched controls.

Table 11
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 Birr, per outpatient visit in the two months preceding the survey.

Table 12

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 Birr, per outpatient visit in the two months preceding the survey. Standard errors in parentheses are clustered at the village level; *** $p<0.01$, ** $p<0.05$.

Table A1
Descriptive statistics at baseline, 2011, Mean (Std. Dev.)

VARIABLES	Insured hhds in CBHI districts (N=489) 1	Non-Insured hhds in CBHI districts (N=714) 2	P-value H₀: (1=2) 3	Non-Insured hhds in non-CBHI districts (N=429) 4	P-value H₀: (1=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
	(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)	
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 center (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) 1	Non-Insured hhds in CBHI districts (N=714) 2	P-value H_0: (1=2) 3	Non-Insured hhds in non-CBHI districts (N=429) 4	P-value H_0: (1=4) 5
Radio use	0.744 (0.437)	0.697 (0.437)	0.0696	0.828 (0.377)	0.0023
Mobile phone use	0.419 (0.494)	0.392 (0.489)	0.3391	0.559 (0.497)	0.0000
Characteristics of health facility					
Share of heads who have completed first degree (12+3)	0.45 (0.498)	0.464 (0.499)	0.6293	0.625 (0.485)	0.0000
Share of the heads who have completed diploma (10+3)	0.55 (0.498)	0.536 (0.499)	0.6293	0.375 (0.485)	0.0000
Share of who have undertaken job training	0.81 (0.393)	0.826 (0.379)	0.4754	0.75 (0.434)	0.0306
Share of health facilities with blood testing equipment	0.924 (0.265)	0.772 (0.419)	0.0000	0.917 (0.277)	0.6723
Share of health facilities with urine testing equipment	0.939 (0.240)	0.879 (0.326)	0.0005	0.917 (0.277)	0.2032
Average waiting time before getting patient card	10.56 (10.06)	14.60 (12.59)	0.0000	11.24 (5.70)	0.2451
Average waiting time to see healthcare professional	28.33 (23.97)	38.48 (29.42)	0.0000	28.375 (11.47)	0.9747
The share of health facilities which were considered as providing high quality care	0.652 (0.478)	0.399 (0.489)	0.0000	0.708 (0.455)	0.0741
Someone to rely on in case of shock	0.403 (0.491)	0.372 (0.484)	0.2846	0. 370 (0.483)	0.3165
Religion of the head					
Muslim	0.190 (0.393)	0.171 (0.377)	0.4022	0.522 (0.501)	0.0000
Orthodox Christian	0.622 (0.485)	0.595 (0.491)	0.3421	0.25 (0.446)	0.0000
Protestant	0.178 (0.383)	0.208 (0.406)	0.1920	0.186 (0.390)	0.7468
Other religion or no religion	0.010 (0.101)	0.026 (0.159)	0.0535	0. 042 (0. 200)	0.0024
Regions					
Tigray	0.207 (0.405)	0.279 (0.449)	0.0042	0.25 (0.434)	0.1217
Amhara	0.303 (0. 460)	0.215 (0. 411)	0.0005	0.25 (0.434)	0.0800
Oromiya	0.272 (0.445)	0.235 (0. 424)	0.1476	0.25 (0.434)	0.4565
SNNPR	0.219 (0.414)	0.271 (0.447)	0.0399	0.25 (0.434)	0.2717
Number of observations	*489*	*735*		*408*	

Table A2
Probability of joining the pilot scheme (marginal effects after logit,
only for households in the CBHI districts)

VARIABLES	Marginal effects (Std. Err.)		Marginal effects (Std. Err.)
Household head characteristics		Access to public infrastructure	
Male headed hh.	0.0149	Travel time to the nearest health center (in minutes)	0.000820*
	(0.0509)		(0.000432)
Age of hh. head	0.000376	Travel time to the nearest public hospital (in minutes)	0.000240
	(0.00178)		(0.000429)
Head has informal education	0.0271	Travel time to the nearest all weather road (in minutes)	-0.000101
	(0.0510)		(0.000601)
Head has primary or above education	0.0713	Travel time to the nearest asphalt road (in minutes)	-0.000181
	(0.0438)		(0.000538)
		Access to improved water	0.0377
Household size	0.0258**		(0.0361)
	(0.0105)	Access to modern light	-0.0687
HH composition (ref: Share of male aged 16 to 64)			(0.0680)
Share of children aged under 6	-0.149	Radio use	-0.0357
	(0.171)		(0.0375)
Share of male aged 6 to 15	0.00178	Mobile phone use	0.0323
	(0.159)		(0.0361)
Share of female aged 6 to 15	0.0941	Characteristics of health facility	
	(0.173)	Share of heads of facilities who have degree (ref: head has diploma)	-0.124
Share of female aged 16 to 64	0.00755		(0.0783)
	(0.199)	Head of the facility has undertaken on-the-job training	-0.0728
Share of elderly aged above 64	-0.247		(0.104)
	(0.185)	Has blood testing equipment	0.332***
Health status of hh. members (ref: share of hh. members with good SAH)			(0.0583)
Share of household with fair SAH	-0.0802	Has urine testing equipment	-0.0612
	(0.0562)		(0.117)
Share of household with low SAH	0.0501	Average waiting time before getting patient card	-0.00219
	(0.117)		(0.00461)
Illness days ratio	0.00437	Average waiting time to see health professional	-0.00487**
	(0.00517)		(0.00214)
SES (Consumption quintiles, ref : Poorest quintile)		Health facilities which were considered as providing high quality care (ref: low quality care)	0.167**
2nd quintile	0.0365		(0.0687)
	(0.0519)	Religion of the head (ref: Muslim)	
3rd quintile	0.0311	Orthodox Christian	0.156**
	(0.0460)		(0.0792)
4th quintile	0.0323	Protestant	0.147
	(0.0516)		(0.109)
Richest quintile	0.0547	Other religion or no religion	-0.0660
	(0.0633)		(0.142)
Trust in modern heath care (ref: disagree)		Regions (ref: SNNPR)	
Neither agree nor disagree	-0.0522	Tigray	0.232*
	(0.0763)		(0.126)
Agree	0.0755	Amhara	0.244**
	(0.0667)		(0.113)
		Oromiya	0.239**
			(0.118)
Number of observations		*1,189*	
Pseudo R-squared		*0.1479*	
Log pseudo likelihood		*-682.667*	

Note: Outcome variable is CBHI enrollment 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 A3
Inpatient 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
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 A4
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 (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (6)	Control hh. from pilot districts (7)	Control hh. from non-pilot districts (8)	Control hh. from pilot and non-pilot districts (9)
Share of households using inpatient care from modern providers	0.00279 (0.0126)	-0.0160 (0.0120)	-0.00304 (0.0113)	0.00227 (0.0135)	-0.0159 (0.0131)	-0.00317 (0.0122)	0.00526 (0.0133)	-0.0242 (0.0150)	-0.00225 (0.0119)
Share of households using inpatient care from public providers	0.00728 (0.0106)	-0.00992 (0.00977)	0.000918 (0.00945)	0.00814 (0.0113)	-0.00855 (0.0105)	0.00239 (0.0101)	0.00988 (0.0116)	-0.0158 (0.0116)	0.00216 (0.0104)
Share of households using inpatient care from private providers	0.00241 (0.0102)	-0.00506 (0.0106)	0.000702 (0.00938)	0.00106 (0.0109)	-0.00492 (0.0115)	-0.000511 (0.0100)	0.00282 (0.0107)	-0.0123 (0.0135)	0.000114 (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 neighbor matching was used to create a sample of treated and matched controls.

Table A5
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 (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (6)	Control hh. from pilot districts (7)	Control hh. from non-pilot districts (8)	Control hh. from pilot and non-pilot districts (9)
Consultation and medicine spending	-4.448 (23.84)	-20.51 (22.35)	-11.32 (21.57)	-6.571 (26.13)	-21.50 (25.05)	-12.29 (23.83)	3.833 (25.29)	1.083 (29.50)	-5.933 (22.87)
Transport and other health care	-0.0126 (7.405)	-7.807 (7.807)	-2.763 (6.763)	-2.200 (8.322)	-6.697 (8.777)	-2.951 (7.547)	-1.550 (8.584)	-7.118 (10.09)	-3.277 (7.783)
Total health spending	-4.461 (29.85)	-28.31 (27.92)	-14.08 (26.81)	-8.771 (32.87)	-28.20 (31.29)	-15.24 (29.59)	2.283 (32.38)	-6.035 (36.62)	-9.210 (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 Birr) for inpatient care in the twelve months preceding the survey; [a] Nearest neighbor matching was used to create a sample of treated and matched controls.

Table A6

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 covariates			Fixed effects after matching [a]		
	Control hh. from pilot districts (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (6)	Control hh. from pilot districts (7)	Control hh. from non-pilot districts (8)	Control hh. from pilot and non-pilot districts (9)
Consultation/medicine spending is at least 5% of household monthly expenditure	-0.0221 (0.0212)	-0.0616*** (0.0201)	-0.0411** (0.0191)	-0.0130 (0.0226)	-0.0562** (0.0222)	-0.0351* (0.0205)	-0.00936 (0.0217)	-0.0446 (0.0296)	-0.0282 (0.0201)
Transport/other health care related spending is at least 5% of household monthly expenditure	-0.00576 (0.0123)	-0.00667 (0.0109)	-0.00842 (0.0107)	-0.00699 (0.0133)	-0.00785 (0.0117)	-0.00979 (0.0113)	-0.00436 (0.0131)	0.00567 (0.0158)	-0.00646 (0.0112)
Total health care spending is at least 5% of household monthly expenditure	-0.0232 (0.0224)	-0.0579*** (0.0207)	-0.0417** (0.0196)	-0.0164 (0.0241)	-0.0540** (0.0229)	-0.0370* (0.0213)	-0.0124 (0.0235)	-0.0318 (0.0297)	-0.0301 (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 neighbor matching was used to create a sample of treated and matched controls.

Table A7

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 (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (6)	Control hh. from pilot districts (7)	Control hh. from non-pilot districts (8)	Control hh. from pilot and non-pilot districts (9)
Consultation/medicine spending is at least 10% of household monthly expenditure	0.00172 (0.0157)	-0.0148 (0.0163)	-0.00674 (0.0148)	0.00442 (0.0165)	-0.0129 (0.0172)	-0.00545 (0.0155)	0.0112 (0.0153)	-0.0151 (0.0224)	-0.000341 (0.0145)
Transport/other health care related spending is at least 10% of household monthly expenditure	-0.00417 (0.00698)	-0.00386 (0.00718)	-0.00622 (0.00662)	-0.00411 (0.00741)	-0.00475 (0.00763)	-0.00677 (0.00694)	-0.00318 (0.00727)	-0.00199 (0.0106)	-0.00532 (0.00674)
Total health care spending is at least 10% of household monthly expenditure	-0.00462 (0.0167)	-0.0232 (0.0165)	-0.0145 (0.0152)	-0.00328 (0.0176)	-0.0214 (0.0177)	-0.0143 (0.0160)	0.00350 (0.0166)	-0.0131 (0.0234)	-0.00865 (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 neighbor matching was used to create a sample of treated and matched controls.

Table A8

Cost of healthcare care, balanced panel, conditional on health care use in all survey years 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	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 observations	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 observations	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 Birr, per outpatient visit in the two months preceding the survey.

Table A9

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 (1)	Control hh. from non-pilot districts (2)	Control hh. from pilot and non-pilot districts (3)	Control hh. from pilot districts (4)	Control hh. from non-pilot districts (5)	Control hh. from pilot and non-pilot districts (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 Birr, in the two months preceding the survey.

Table A10

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 (0.0520)	-0.0527 (0.0425)	The share of households used outpatient care from public hospital	-0.00874 (0.0169)	-0.0296** (0.0146)
Share of households using outpatient care from public providers	-0.0364 (0.0439)	-0.00681 (0.0392)	No. of outpatient visits per hh. member to modern facility	-0.0219 (0.0315)	-0.0175 (0.0291)
Share of households using outpatient care from private providers (clinic)	-0.0423 (0.0394)	0.0235 (0.0312)	No. of outpatient visits per hh. member to public facility	-0.00764 (0.0235)	-0.0136 (0.0217)
Share of households using outpatient care from a health post (public)	0.00735 (0.0147)	-0.0125 (0.0135)	No. of outpatient visits per hh. member to private facility	-0.0285 (0.0217)	0.00852 (0.0214)
Share of households using outpatient care from health centers (public)	-0.00135 (0.0369)	-0.00806 (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 A11

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 (17.54)	-30.07 (22.39)	The share of households used outpatient care from public hospital for inpatient care	-14.08 (22.59)	-25.78 (28.07)
Transport and other health care related spending for outpatient care	-3.057 (3.984)	1.819 (5.345)	No. of outpatient visits per hh. member to modern facility for inpatient care	-10.35 (6.898)	-5.959 (17.24)
Total health spending for outpatient care	-14.71 (20.28)	-28.25 (25.84)	No. of outpatient visits per hh. member to public facility for inpatient care	-24.42 (28.14)	-31.74 (38.08)

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

Table A12
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 (0.00556)	-0.00577 (0.00470)	Incidence of total health care spending is at least 5% of household monthly expenditure	-0.0716* (0.0362)	0.00496 (0.0305)
Transport/other health care related spending as share of household monthly expenditure	-0.00169 (0.00159)	0.00151 (0.00185)	Incidence of households where consultation/medicine spending is at least 10% of household monthly expenditure	-0.0269 (0.0261)	-0.00849 (0.0181)
Total health care spending as share of household monthly expenditure	-0.00878 (0.00660)	-0.00426 (0.00587)	Incidence of households where transport/other health care related spending is at least 10% of household monthly expenditure	0.00424 (0.00723)	-0.00945 (0.00850)
Incidence of households where consultation/medicine spending is at least 5% of household monthly expenditure	-0.0686* (0.0364)	-0.0121 (0.0293)	Incidence of total health care spending is at least 10% of household monthly expenditure	-0.0276 (0.0281)	-0.0147 (0.0206)
Incidence of households where transport/other health care related spending is at least 5% of household monthly expenditure	-0.0156 (0.0153)	0.0187 (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.