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Abstract

In June 2011, the Government of Ethiopia introduced a pilot Community Based Health Insurance (CBHI) scheme in rural parts of the country. Based on a fixed effects analysis of household panel data, this paper assesses the impact of the scheme on utilization of modern healthcare and the cost of accessing healthcare. It adds to the relatively small body of work that provides a rigorous evaluation of CBHI schemes. We find that in the case of public health facilities, enrolment leads to a 30-41% increase in utilization of outpatient care, a 45-64% increase in the frequency of visits and at least a 56% decline in the cost per visit. The impact on utilization and costs combined with a high uptake rate of almost 50% within two years of scheme establishment underlines the relative success of the Ethiopian scheme. While there are several reasons for this success, a comparative analysis of the design and execution of the Ethiopia CBHI with the existing body of work yields two distinct features. First, the Ethiopian scheme is embedded within existing government administrative structures and to signal government commitment, scheme performance and uptake is used as a yardstick to measure the success of the administration. Second, an existing social protection scheme was used to spread information, raise scheme awareness and encourage uptake of health insurance. The alignment of the interests of administrators with scheme performance and interlinking of social protection schemes are innovative design features that are worth considering as developing countries strive to enhance access to health care through voluntary insurance schemes.

Key words: Community based health insurance, 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 healthcare services and provide financial protection. As a prelude to potential national level coverage, the Government of Ethiopia introduced a pilot CBHI 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 (1.8 million individuals). The aim of this paper is to examine the effect of the scheme on access to healthcare, 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), Soors et al. (2010) and Mebratie et al. (2013). Based on 45 published and unpublished works, Jakab and Krishnan (2001) conclude that there is convincing evidence that community health financing schemes are able to mobilize resources to finance healthcare needs, albeit with substantial variation across schemes. They also argue that the schemes are effective in terms of reaching low-income groups although the ultra-poor are often excluded. Preker et al. (2002), reach a similar conclusion. 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

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develop stylized facts is questionable and only five studies included in his review may be considered of high-quality. These studies are labeled high-quality as they attempt to use matching methods or difference-in-difference, 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 have examined the impact of the schemes on OOP payments, of which seven conclude that the schemes are not associated with a reduction in OOP healthcare expenditure. Methodologically, a critical comparison of the 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 enrolment in such schemes is voluntary they may be more likely to attract individuals with existing medical conditions and/or relatively wealthy households. However, except for a handful of papers, the bulk of the CBHI evaluation literature is based on cross-section data and does not account for selection effects. Mebratie et al. (2013) find that only 5 of the 35 studies on utilization which apply regression analysis use panel data. 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. Working with cross-section data and ignoring self-selection is likely to lead to unreliable estimates.

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 canvassed before (one wave) and after the intervention (two waves), a health facility survey and qualitative data obtained from 15 key informant interviews (KII) and eight focus group discussions (FGD). These data allow us to contribute to the existing literature in terms of producing a credible impact evaluation of a CBHI scheme. Furthermore, our analysis of the design and execution of the Ethiopian CBHI is relevant for policy not just for Ethiopia but also for other Sub-Saharan countries which are currently considering various option that may be used to universalize access to healthcare.

The next section describes the context and key features of the CBHI scheme. Section 3 discusses data and the research methods. Section 4 contains estimates, while section 5 contains a discussion and concluding remarks.

2. Context and key features of the Ethiopian CBHI scheme

2.1 Context

The public healthcare system in Ethiopia has a three-tiered structure consisting of health posts, health centers and hospitals. Almost all of the country's about 16,000 villages have a health post which offers preventive and promotive services and is staffed by two health extension workers. According to FMoH (2016), as of 2015, there were 16,447 functional health posts with a deployment of more than 42,000 health extension workers or one health post for 5,477 individuals. Health centers which offer preventive and curative care are expected to cater to a population of 25,000 individuals and are typically staffed by two health officers, three midwifes, five to seven nurses and laboratory technicians. Health centers refer cases to district, zonal, regional or national level hospitals. The latest

figures (FMoH, 2016) show that the norm is within reach as there are 3,547 functional health centers or a ratio of one health center for 25,395 individuals.

Between 2000 and 2015 there has been a rapid increase in the supply of health infrastructure with a 20-fold increase in the number of health posts, a 10-fold increase in the number of health centers and a four to five fold increase in the number of public hospitals. The participation of the private sector (located mainly in urban areas) witnessed similar growth over the same period (FMoH, 2016). Consistent with the increase in health infrastructure, per capita healthcare spending has grown from US$4 in 1995-96 to US$26 in 2014-15 (FMoH, 2015). As a result of these efforts, access to essential healthcare services, as measured by availability of health posts or health centers within a two hour walking distance has increased from 51% in 2000 to 93% in 2013 (FMoH, 2016).

Despite these increases in the supply of healthcare, overall utilization of health care services remains low. For instance, in 2013, only 23.1% of deliveries were assisted by skilled birth attendants and outpatient healthcare utilization per capita per year increased only marginally from 0.27 visits in 2000 to 0.34 visits in 2013 (FMoH, 2016). These low utilization rates are accompanied by high reliance on international donors and OOP expenses to finance healthcare. According to FMoH (2010) the three main sources of healthcare financing in Ethiopia are local and international donors (40%), OOP spending (37%), and central and local governments (21%). It is against this background of substantial investments in healthcare infrastructure, limited increases in healthcare utilization and excessive reliance on international donors that the government launched a CBHI scheme.

2.2. The Ethiopian CBHI scheme

The CBHI pilot scheme was introduced by Ethiopia's FMoH in June 2011, as part of a broader healthcare financing reform strategy aimed at improving quality and coverage of

health services by identifying alternative healthcare resources (USAID, 2011). Twelve districts, spread across four main regions of the country, were selected to pilot the CBHI. The total population of these four main regions account for about 86% of the national population (Population Census Commission, 2008). The pilot districts were selected by the government based on two criteria: the districts should have undertaken healthcare financing reforms designed to increase cost recovery and retention of locally raised revenues, and health centres in these districts should be geographically accessible (located close to a main road).

The Ethiopian CBHI scheme can be characterized as a government run program with community involvement in scheme design, management and supervision. Benefit packages, registration fees and premium payments were determined in collaboration with regional governments, and are similar within each of the four regions but differ slightly across regions. Following a range of awareness creation activities, CBHI participation had to be endorsed at the village level (a simple majority at a village general assembly) after which households could decide whether to enroll. In order to reduce adverse selection the unit of membership is the household rather than the individual (FMoH, 2008). 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 the district level.

Household level monthly premiums depend on household composition. For core household members (a mother, father, and their children below 18) the premiums range between ETB 10.50 per household in SNNPR to ETB 15 in Oromiya, while premiums in Amhara region are set at ETB 3.00 per individual per month (see Table A1). Additional monthly premiums for each non-core household member vary between ETB 2.10 and ETB 3.00. The premiums mentioned above are net of a 25% subsidy covered by the central government. On average, the premiums amount to about 0.5% of

household monthly income. District and regional governments are expected to cover the costs of providing a fee waiver to the poorest 10% of the population. By December 2013, 7.4% of total eligible households had received a fee-waiver. 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 all outpatient and inpatient healthcare services that are available in public facilities. Care at private providers is not covered unless a particular service or drug is unavailable at a public facility. Treatment outside the country is not covered, nor is medical treatment with largely cosmetic value. CBHI members are exempt from co-payments as long as they follow the scheme's referral procedure. Members are expected to first visit a health center, which can provide referral letters for higher level care at district or regional hospitals.

According to our survey data, scheme uptake was 41% in April 2012 and reached 48% in April 2013 (Table 1). The overall enrolment rates based on survey data are similar to enrolment rates based on administrative data, which reached 45.5% in December 2012 (Mebratie et al. 2015). The renewal rate after one year was 82%, while 25% of those who had not enrolled in the first year, did eventually join the scheme a year later. We see substantial variation in enrolment rates across regions, ranging from 35% in SNNPR in 2013 to 63% in the Amhara region. Enrolment and speed of uptake are relatively high, compared to the experience in other African countries. 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).

3. Data and methods

3.1 Data

The paper is based primarily on three-rounds of household panel data from rural Ethiopia. The first round of the survey was collected between March- April 2011, a few months before the roll out of the CBHI scheme, while the second round took place a year later during March- April 2012 and the third round in March- April 2013. All surveys were conducted by a team led by one of the authors. The data were collected by 8 teams, each of which included 4 enumerators and 1 supervisor. Each team was responsible for collecting data from 2 districts.

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. Pilot districts were selected by the government on the basis of having implemented a cost recovery and local revenue retention programme and if they had health centers that were readily accessible. In each region, the non-pilot districts were also selected on the basis of complying with these two conditions. In addition to satisfying these two conditions, if a majority of the pilot districts in a region were food insecure (secure) then a food insecure (secure) non-pilot district was selected to serve as a control. If multiple districts fulfilled all three conditions then we chose the district with the greatest concentration of readily accessible health centers.

Within each district, 6 villages 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 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 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 healthcare utilization for each household member. The recall period for outpatient healthcare is two months preceding the survey while it is 12 months in the case of inpatient healthcare. Health expenditure including transport costs, consultation and diagnosis costs and drug costs for each episode of healthcare 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 healthcare services in determining enrolment and outcomes, information from the household surveys was combined with data gathered from 48 healthcare centers (3 randomly selected health centers from each of the 16 districts). We focused on health centers as these the main source of curative healthcare in rural Ethiopia. The health facility survey was canvassed in 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 the health center, on the time taken to obtain a patient card and time taken between obtaining the patient card and consulting with a healthcare professional. Based on information obtained from the district health offices the sampled households were matched to the 48 health centers on the basis of geographical proximity.

3.2 Empirical framework

Our aim is to identify the impact of the CBHI scheme on healthcare utilization, cost of care and out-of-pocket expenditure. We focus on these, as they are the primary outcomes through which insurance may be expected to influence household welfare. There are two channels through which the CBHI scheme may promote greater use of

healthcare. Prior to being offered insurance, households in the pilot districts were provided information on the insurance scheme and also on the availability of healthcare 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 which is defined as utilization of healthcare services from health posts, health centers, private clinics, and public or private hospitals. 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 covered by the CBHI 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 the effect of the scheme on intensity of healthcare 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% of total

household expenditure. Since the scheme covers only spending on healthcare, we examine its effect on medical (consultation and medicine) and ancillary costs (transport and others) separately.

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

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

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

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 several time varying household and community level covariates (X_{it}). These include education of household head, household demographic composition, time taken to reach health centers, time taken to reach the nearest all weather road, access to water, access to electricity. Finally, we also use propensity score matching (five nearest neighbor) and subsequently estimate a weighted version of equation (1) using only treated and matched controls that are on support. The full set of variables in the propensity score (CBHI enrollment) equation includes characteristics of the household head (sex, age, religion, education) and of the

household (size, demographic composition, self-assessed health status, illness experience in two months recall period, consumption quintiles), trust in modern care, several variables to capture the quality of care, access to public infrastructure and district dummies.

An advantage of the sampling strategy is that it provides two potential control groups: uninsured households in the pilot districts and in the non-pilot districts. This can help assess the identifying assumption of parallel trends. The main threats to this assumption are selection on health shocks and spillover effects. The former is largely negated by the waiting period and household registration, while the lack of sensitivity to including time variant observables suggests that the enrolment decision was predominantly based on time constant factors. But spillover effects are more difficult to address, since all households in the pilot districts were exposed to information on the scheme and the importance of using modern health services, which could indirectly influence utilization. In addition, the non-insured could be crowded out by increased healthcare demand among CBHI enrollees. Households from non-pilot districts are not affected by these selection and spillover effects, and are therefore a useful alternative control group. However, this control group comes with its own concerns. Although drawn from the same region and based on the same criteria used to identify the pilot districts, the non-pilot districts can potentially experience different macro shocks. Despite the limitations of each control group, using both offers a useful robustness check 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. In addition to the robustness analysis, we also formally test the parallel trend assumption by estimating (placebo) regressions which test differences in outcome between the two control groups.

4. Estimates

4.1 Who enrolls?

Given the potential selection effects due to voluntary enrolment, we first assess 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 pilot and non-pilot districts display evidence of greater similarity between households located in the same district as compared to those in a different district (Table A2). Larger households with more educated household heads, belonging to the poorest quintiles and those with good self-reported health status are more likely to enroll. Based on our KIIs this may be attributed to the greater participation of lower quintile households in the productive safety net program which caters to food insecure households and was also used as a platform to spread awareness of the CBHI (for details see Shigute et al. 2017). Quality of care is found to be an important factor in determining enrolment.

However, when we include all these variables 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 at baseline level do not have a bearing on enrolment in 2012 and that the key factors determining enrolment are quality of healthcare services and district fixed-effects (Table A3). The lack of evidence, from the enrolment regression, that wealthier or less healthy households are more likely to join the scheme allays concerns about household selection effects confounding the impact estimates. A more detailed discussion of the reasons for the lack of a link between household health conditions and enrolment is provided in Mebratie et al. (2015). In a related paper we also show that there is no evidence that expectations about medical expenditures influence the decision to take out health insurance (see Yilma et al., 2015). At the same time, in addition to controlling for district fixed-effects, the estimates highlight the need to

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control for differences in access to better quality healthcare, which we do, as such access may lead to greater healthcare usage regardless of CBHI enrolment.

4.2 Healthcare utilization

Trends in outpatient healthcare utilization by CBHI status are provided in Table 2. In 2011, the share of insured and uninsured households in pilot districts using outpatient care from modern providers is similar (38% for insured and 39% for uninsured). In the post-CBHI period, 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 stable. The same pattern holds for use of care from public providers, although the increase is larger for the insured. The use of private care shows a decrease from 2011 to 2013 for the treatment and control groups. In terms of healthcare 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 use 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.

Household fixed effects estimates of the impact of CBHI on outpatient healthcare utilization are provided in Table 3. To examine robustness, estimates based on district fixed effects and (household) fixed effects after propensity score matching are reported in Tables A5 and A6. Based on the estimates reported in columns 4 to 6, CBHI enrolment is associated with a 6-11 percentage point increase in the use of modern healthcare. The point estimate is larger (11 percentage point increase) when households within the pilot districts are used as a control group as compared to households located in the non-pilot districts (6 percentage point increase). The effect emanates mainly from

an increase in the probability of using public providers. The 8-11 percentage point increase in the use of public providers translates into a 30-41% 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.

The increase in the probability of using publicly provided care comes predominantly from increased use of health centers: a 10-11 percentage point increase in the probability of using health centers and a 1-3 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 is the scheme associated with an increase the probability of using care, it is also associated with an increase in the frequency of visits to healthcare providers. In the 2 months preceding the survey, CBHI participation seems to have led to an increase in the number of outpatient visits per household member to a public facility by about 0.05-0.07. This is a 45-64% increase in the frequency of healthcare use, relative to the baseline (0.11 visits). The results are robust to the estimation approach and choice of control group.

We do not assess the impact on inpatient care because the reported incidence of hospitalization for the 12 months preceding each survey is below 5%, offering insufficient variation to identify precise treatment effects.

4.3 Healthcare spending

Descriptive statistics for healthcare expenditure are provided in Table 4 and the impact estimates in Table 5. The estimates suggest a negative association of healthcare spending with CBHI, mostly due to reduced costs of consultation and medicine. However, while

the coefficients are substantial (ranging from 11-27 Birr or a reduction of between 21% to almost 50% of baseline expenditure), the effects are only statistically significant when we use the non-pilot districts as control group. We see similar results for the budget share of healthcare spending and for the incidence of catastrophic healthcare spending.

While the CBHI seems to have a clear effect on increasing the use of healthcare services, the effect on reducing the cost of accessing healthcare is not convincing due to lack of precision. The increase in the use of healthcare without a corresponding increase in the amount spent on healthcare suggests that the cost per healthcare visit has declined. To confirm the magnitude of this effect we estimate the impact on the cost of accessing outpatient care per visit, conditional on using healthcare. Trends in the cost of care per visit are provided in Table 6 while the CBHI impact estimates are displayed in Table 7. 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 7 indicate that the cost of care per visit to a public facility declines by about 35-54 Birr per visit. Compared to the baseline cost of 62 Birr per visit to a public facility these changes represent declines of between 56-87%. Thus, while the scheme leads to a decline in costs of accessing care it does not cover all costs. Insights gleaned from KIIs and FGDs help shed some light on this issue. A number of scheme enrollees who participated in the FGDs 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, in particular, the limited availability of drugs and equipment which then forces households to resort to private care.

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

4.4 Parallel trends assumption and crowding out

A concern for the empirical strategy is that if uninsured households in the pilot districts benefit from the scheme then it may lead to an underestimate of the scheme effect. Contrary to this hypothesis, Table 2 shows a declining trend in the incidence and intensity of outpatient care use for uninsured households in the pilot districts while there is an increasing trend for insured households. The decline in use of care for the uninsured group is unlikely to be due to macroeconomic changes or external shocks since such events are likely to affect both insured and uninsured households in the same way. An alternative explanation could be that the strong initial enrolment into the CBHI induced crowding-out effects for uninsured patients. The first follow up survey provides some suggestive evidence of crowding out as about 34% of respondents believed that health workers favored insured patients.

We may assess the scope for potential bias due to crowding out by comparing trends in the outcome variables for the two control groups. Since neither of these groups are covered by CBHI, we should not observe any differences in outcomes for households in these two control groups, that is, the impact results should be robust to the choice of control group. However, if control households in the pilot districts are indeed adversely affected by the scheme then estimates based on using this group as a comparison are likely to overestimate the impact of CBHI on healthcare utilization. Tables 4 to 6 do show larger impact estimates when the control group consists of the non-insured in pilot districts, but the pattern and interpretation of the estimation results are not affected by the choice of control groups. The differences in the impact estimates

by choice of control group fall within two standard deviations. To formally test for crowding out effects we conducted a series of placebo tests for differences in outpatient healthcare utilization between the two control groups (see Table A15). Except for 1 of the 18 tests, the results are not statistically significant for any of the outcome measures. This is in line with expected Type 1 errors in terms of falsely rejecting a null, suggesting that the parallel trends assumption is credible and our impact estimates are not confounded by crowding out effects.

There is also no evidence that scheme enrolment is influenced by pre-existing health conditions or expected healthcare expenditure (Mebratie et al., 2015; Yilma et al., 2015). Furthermore, the increase in utilization of healthcare 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. Observing effects for outcomes that are expected to be influenced by CBHI, but not for other outcomes, suggests that the estimates may be attributed to the scheme.

Despite the evidence that scheme enrollment is not influenced by pre-existing health conditions or expected health expenditure and that the effects emanate from public health facilities, it is possible that other time-varying unobserved factors such as social capital and social networks may influence scheme enrolment and also influence healthcare use leading to biased estimates. While we recognize that it is impossible to rule out all sources of self-selection, it does seem that the estimates are not susceptible to a number of potential sources of bias.

5. Discussion and concluding remarks

This paper used a fixed effects analysis to identify the impact of a pilot CBHI scheme on utilization of healthcare and the costs of accessing care. Depending on the control group,

our analysis shows that the scheme is associated with a 30-41% increase in utilization of outpatient care at public facilities, a 45-64% increase in the frequency of outpatient visits to public facilities, and a 56-87% decline in the cost per outpatient visit to public facilities. While not without its problems, especially in terms of continued concerns about quality of care, an uptake of almost half the target households within two years of scheme establishment and the large effects on utilization are impressive. From an international perspective, these outcomes are especially notable as compared to the relative difficulties in encouraging uptake experienced in a number of CBHI initiatives in other parts of Sub-Saharan African where uptake rarely goes above 30% (Mebratie et al. 2013).

There are several reasons for the relative success of the Ethiopian scheme, such as, good preparation, substantial supply-side investments prior to scheme launch, scheme simplicity and affordability. However, our assessment based on the empirical evidence, both quantitative and qualitative and a comparison with the existing body of work, yields two points on scheme design and execution which are worth highlighting. First, the scheme is embedded within existing government structures and as a signal of government commitment, scheme performance and in particular, scheme uptake is used as a yardstick to measure the success of the village administration. Second, the CBHI scheme was interlinked to an existing social protection scheme, the productive safety program, which was used as a platform to spread information, raise scheme awareness and encourage uptake (see Shigute et al. 2017). The alignment of the interests of administrators with scheme performance and interlinking of schemes are both innovative design features that should be considered as countries strive to enhance access to health care through voluntary insurance schemes. Whether the effectiveness of such features extends beyond the Ethiopian case and indeed whether such features can be incorporated in schemes in other countries are open and researchable questions.

Additionally, issues such as the effect of the scheme on quality of health care and revenue mobilization as well as its financial sustainability still need to be explored.

Nevertheless, based on the success of the pilot the government has scaled up the CBHI and as of September 2017, the scheme has been expanded from 13 pilot districts to 366 districts of which 280 districts have started providing services while 86 districts are in the process of registering members and collecting premiums. While still small (about 16%), as a percentage of the population, currently the CBHI scheme provides health insurance coverage to almost 16 million individuals. In their review of the literature, Soors et al. (2010) point out that in Sub-Saharan Africa, except for Rwanda and Ghana, community health insurance schemes play a minor role in achieving universal coverage. Based on the results reported in this paper, it appears that the Ethiopian scheme has the potential to help the country meet some of the goals of universal access to health coverage.

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Tables

<table>
<tr><th colspan="9">Table 1: CBHI enrolment and drop-out in the pilot regions</th></tr>
<tr><th rowspan="3">Region</th><th colspan="2">April 2012</th><th colspan="6">April 2013</th></tr>
<tr><th colspan="2">Enrolled</th><th colspan="2">Enrolled</th><th colspan="2">Dropped-out</th><th colspan="2">New members</th></tr>
<tr><th>%</th><th>N</th><th>%</th><th>N</th><th>%</th><th>N</th><th>%</th><th>N</th></tr>
<tr><td>*Tigray*</td><td>33.9</td><td>101</td><td>50.2</td><td>146</td><td>26.5</td><td>26</td><td>38.3</td><td>74</td></tr>
<tr><td>*Amhara*</td><td>49.5</td><td>148</td><td>62.7</td><td>188</td><td>6.9</td><td>10</td><td>33.8</td><td>52</td></tr>
<tr><td>*Oromiya*</td><td>44.2</td><td>133</td><td>44.5</td><td>133</td><td>21.2</td><td>28</td><td>17.4</td><td>29</td></tr>
<tr><td>*SNNPR*</td><td>35.3</td><td>107</td><td>35.4</td><td>107</td><td>21.5</td><td>23</td><td>11.8</td><td>23</td></tr>
<tr><td>**Total**</td><td>**40.7**</td><td>**489**</td><td>**48.2**</td><td>**574**</td><td>**18.0**</td><td>**87**</td><td>**25.1**</td><td>**178**</td></tr>
</table>

Notes: The table indicates households enrolled in CBHI as a share of sampled households in CBHI pilot districts. Of the 489 households enrolled in April 2012 we were unable to resurvey 6 households in 2013. The drop-out rate is 87/483.

Table 2: 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
Share of households using healthcare									
Modern providers	0.38	0.41	0.40	0.39	0.31	0.29	0.32	0.30	0.32
Public providers	0.27	0.32	0.35	0.29	0.23	0.22	0.23	0.22	0.20
Private providers	0.10	0.12	0.7	0.11	0.09	0.08	0.12	0.14	0.10
Share of households using public care									
Public health post	0.03	0.02	0.02	0.03	0.03	0.01	0.02	0.01	0.01
Public health centers	0.20	0.26	0.30	0.20	0.16	0.17	0.17	0.14	0.15
Public hospital	0.06	0.03	0.03	0.05	0.03	0.03	0.02	0.02	0.04
Number of visits per household member									
Modern providers	0.15	0.18	0.15	0.16	0.12	0.10	0.14	0.12	0.11
Public providers	0.11	0.15	0.14	0.12	0.09	0.07	0.10	0.08	0.07
Private providers	0.04	0.04	0.02	0.05	0.03	0.03	0.04	0.05	0.03

Notes: Use of outpatient care in the two months preceding the survey. In 2011, households are categorized as insured if enrolled in 2012 or 2013.

Table 3: The impact of CBHI on the probability of outpatient care utilization

Outcome variable:	Fixed effects without covariates			Fixed effects with time varying covariates		
	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts
	(1)	(2)	(3)	(4)	(5)	(6)
Share of households using healthcare						
Modern providers	0.101***	0.0600**	0.0797***	0.107***	0.0580*	0.0787***
	(0.0302)	(0.0295)	(0.0280)	(0.0305)	(0.0310)	(0.0284)
Public providers	0.108***	0.0856***	0.0985***	0.114***	0.0821***	0.0983***
	(0.0271)	(0.0274)	(0.0256)	(0.0275)	(0.0284)	(0.0259)
Private providers	0.0243	0.00999	0.0172	0.0233	0.00839	0.0149
	(0.0208)	(0.0233)	(0.0198)	(0.0225)	(0.0256)	(0.0217)
Share of households using public care						
Public health post	0.0102	0.0102	0.00968	0.00648	0.00909	0.00767
	(0.0104)	(0.0115)	(0.00975)	(0.0110)	(0.0123)	(0.0102)
Public health center	0.109***	0.105***	0.108***	0.110***	0.0995***	0.106***
	(0.0220)	(0.0237)	(0.0213)	(0.0212)	(0.0234)	(0.0206)
Public hospital	-0.0178	-0.0324***	-0.0239**	-0.0117	-0.0310***	-0.0220*
	(0.0120)	(0.0106)	(0.0107)	(0.0124)	(0.0113)	(0.0111)
Number of visits						
Modern providers	0.0620***	0.0436**	0.0554***	0.0624***	0.0376*	0.0516***
	(0.0217)	(0.0194)	(0.0181)	(0.0231)	(0.0209)	(0.0191)
Public providers	0.0628***	0.0542***	0.0589***	0.0675***	0.0535***	0.0595***
	(0.0165)	(0.0160)	(0.0149)	(0.0170)	(0.0157)	(0.0150)
Private providers	0.0160	0.00452	0.00938	0.0140	0.000386	0.00639
	(0.0113)	(0.0110)	(0.0101)	(0.0125)	(0.0133)	(0.0116)
N	3,555	3,126	4,707	3,369	2,940	4,418

Notes: Standard errors in parentheses are clustered at the village level; *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

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
Transport and other healthcare related spending	13.6	15.5	13.5	6.2	7.2	10.9	8.0	12.6	13.0
Total health spending	66.9	65.2	36.5	48.9	48.0	42.9	46.7	61.0	79.7
Inpatient care									
Consultation and medicine spending	41.6	26.4	43.2	29.1	37.4	21.3	7.5	19.1	38.4
Transport and other healthcare related spending	6.3	7.7	21.1	9.2	12.9	15.5	0.6	10.5	23.5
Total health spending	47.9	34.2	64.3	38.2	50.3	36.8	8.1	29.5	61.8
Total OOP spending budget share									
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 OOP spending > 5% budget share	0.150	0.103	0.056	0.152	0.094	0.102	0.099	0.112	0.115

Notes: Outpatient spending (Ethiopian Birr) in the two months preceding the survey, inpatient spending in the twelve months preceding the survey. In 2011 households are categorized as insured if enrolled in 2012 or 2013.

Table 5: The impact of CBHI on out-of-pocket spending for outpatient care

Outcome variable	Fixed effects without covariates			Fixed effects with time varying covariates		
	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts
	(1)	(2)	(3)	(4)	(5)	(6)
Consultation and medicine spending	-14.51	-30.05**	-22.39*	-11.04	-27.56*	-20.07
	(13.35)	(13.73)	(12.72)	(13.87)	(15.23)	(13.53)
Transport and other healthcare	-2.619	-3.49	-3.28	-2.23	-3.21	-3.23
	(4.29)	(3.86)	(3.97)	(4.57)	(4.15)	(4.21)
Total health spending	-17.13	-33.53**	-25.67	-13.27	-30.77*	-23.30
	(16.32)	(16.37)	(15.49)	(17.02)	(17.99)	(16.42)
Share of household monthly spending	-0.004	-0.01**	-0.01*	-0.002	-0.01**	-0.01
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
OOP spending > 5% budget share	-0.02	-0.06***	-0.04**	-0.02	-0.05**	-0.04*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
N	3,555	3,126	4,707	3,369	2,940	4,418

Notes: Outpatient spending (Ethiopian Birr) in the two months preceding the survey. Standard errors in parentheses are clustered at the village level; ** p<0.05, * p<0.1.

Table 6: Cost of outpatient care, conditional on healthcare use (unbalanced panel)

Outcome variable	CBHI pilot districts						Non-CBHI pilot districts		
	Insured households			Uninsured households					
	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
N	*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
N	*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
N	*71*	*60*	*37*	*60*	*60*	*51*	*48*	*55*	*37*

Notes: Cost of outpatient care is defined as a household's payment for healthcare - consultation and medicine (Ethiopian Birr) - per outpatient visit in the two months preceding the survey. In 2011 households are categorized as insured if enrolled in 2012 or 2013.

Table 7: Cost of healthcare care conditional on healthcare use (unbalanced panel)

Outcome variable	Difference-in-differences without covariates			Difference-in-differences with covariates		
	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts	Control: pilot districts	Control: non-pilot districts	Control: 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)
N	*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)
N	*1,002*	*857*	*1,256*	*927*	*792*	*1,156*
Private care price	-16.39	-83.85	-50.89	-15.57	-131.56	-62.31
	(35.76)	(59.36)	(40.99)	(34.69)	(83.61)	(49.14)
N	*337*	*327*	*475*	*326*	*301*	*443*

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

Supplemental Appendix [not for publication, but available online]

Table A1: CBHI premiums

Region	Unit of contribution	Premium per month		Premium 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: Core household members include a mother, father, and their children below age 18. The premiums listed in the table reflect household level contributions to the scheme net of the subsidy provided by the central government. In addition to the premiums there is a one-time registration fee of ETB 5.00 per household. **Source:** Abt Associates and KIIs at the federal, district and regional levels.

Table A2: Descriptive statistics at baseline, 2011

VARIABLES	Insured hhds in CBHI districts (N=489)	Non-Insured hhds in CBHI districts (N=714)	P-value H0: (1=2)	Non-Insured hhds in non-CBHI districts (N=429)	P-value H0: (1=4)
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 health 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)	
Radio use	0.744	0.697	0.0696	0.828	0.0023
	(0.437)	(0.437)		(0.377)	

VARIABLES	Insured hhds in CBHI districts (N=489)	Non-Insured hhds in CBHI districts (N=714)	P-value H₀: (1=2)	Non-Insured hhds in non-CBHI districts (N=429)	P-value H₀: (1=4)
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 A3: Comparison of health facility characteristics in treatment and control districts

Variable	HCs located in treatment districts		HCs located in control districts		Mean diff. p-value
	Mean	**SD**	**Mean**	**SD**	
Human resource					
No of Total Medical staff	16.2	8.28	18.0	8.27	0.5507
Availability of medical facility and equipment					
Blood test	0.79	0.42	0.93	0.26	0.2185
Urine test	0.85	0.36	0.93	0.26	0.4208
Stool test	0.79	0.42	0.93	0.26	0.2185
Rapid HIV/test	0.91	0.29	1.00	0.00	0.2367
TB and leprosy service	0.94	0.24	0.93	0.26	0.9376
Ante-natal care	1.00	0.00	1.00	0.00	--
Delivery service	1.00	0.00	1.00	0.00	--
Post-natal care	1.00	0.00	1.00	0.00	--
Family planning service	1.00	0.00	1.00	0.00	--
Abortion care	0.45	0.51	0.47	0.52	0.9394
EPI(Extended program of immunization	0.97	0.17	0.93	0.26	0.5687
Neo-natal care	0.91	0.29	0.93	0.27	0.8313
Availability of medical supplies					
Drugs acting on the gastro-intestinal system	0.97	0.17	0.93	0.26	0.5687
Drugs acting on the cardiovascular system	0.52	0.51	0.53	0.52	0.9094
Drugs acting on the respiratory system	1.00	0.00	1.00	0.00	--
Drugs used for anesthesia	0.67	0.48	0.67	0.49	1.0000
Anti-infectives	0.97	0.17	1.00	0.00	0.5061
Drugs used in obstetrics & gynecology	0.88	0.33	0.87	0.35	0.9088
Drugs used for correcting water, electrolyte and acid-base disturbances	0.88	0.33	1.00	0.00	0.1658
Vitamins	1.00	0.00	1.00	0.00	--
Antihistamines and anti-allergics	1.00	0.00	0.93	0.26	0.1397
Drugs used for eye diseases (Ophthalmic agents)	0.88	0.33	0.93	0.26	0.5760
Drugs acting on the ear, nose & throat	0.85	0.36	0.87	0.35	0.8720
Drugs acting on the skin (Dermatologic agents)	1.00	0.00	0.93	0.26	0.1397
Antidotes and other substances used in poisoning	0.36	0.49	0.40	0.51	0.8143
Intravenous (IV) fluids	1.00	0.00	1.00	0.00	--
Antimalarial drugs	1.00	0.00	1.00	0.00	--
Anthelminthic (deworming agents)	1.00	0.00	1.00	0.00	--
Waiting time (in min)					
Average waiting time to get medical card	11.27	11.99	14.06	9.56	0.4455
Average waiting time to see medical doctor	30.72	27.31	33.19	21.22	0.7588
Observations	*33*		*15*		

Table A4: Probability of joining the pilot scheme (logit marginal effects, households in CBHI districts)

VARIABLES	Marginal effects (Std. Err.)		Marginal effects (Std. Err.)
Household head characteristics		Access to public infrastructure	
Male headed hh.	0.0141	Travel time to the nearest health center (in minutes)	0.000118
	(0.0527)		(0.000405)
Age of hh. head	-0.00111	Travel time to the nearest public hospital (in minutes)	0.000630*
	(0.00189)		(0.000380)
Head has informal education	-0.00251	Travel time to the nearest all weather road (in minutes)	-1.60e-05
	(0.0470)		(0.000596)
Head has primary or above education	0.0380	Travel time to the nearest asphalt road (in minutes)	-0.000964**
	(0.0438)		(0.000432)
		Access to improved water	-0.0373
Household size	0.0301***		(0.0336)
	(0.0101)	Access to modern light	-0.0717
HH composition (ref: Share of male aged 16 to 64)			(0.0667)
Share of children aged under 6	-0.0730	Radio use	-0.0125
	(0.172)		(0.0387)
Share of male aged 6 to 15	-0.00593	Mobile phone use	0.0507
	(0.162)		(0.0337)
Share of female aged 6 to 15	0.113	Characteristics of health facility	
	(0.170)	Share of heads of facilities who have degree (ref: head has diploma)	-0.0990
Share of female aged 16 to 64	0.0643		(0.0615)
	(0.197)	Head of the facility has undertaken on-the-job training	0.00951
Share of elderly aged above 64	-0.193		(0.0719)
	(0.193)	Has blood testing equipment	0.270**
Health status of hh. members (ref: share of hh. members with good SAH)			(0.114)
Share of household with fair SAH	0.000118	Has urine testing equipment	-0.124
	(0.0527)		(0.185)
Share of household with low SAH	0.160	Average waiting time before getting patient card	-0.00813
	(0.123)		(0.00626)
Illness days ratio	0.0074	Average waiting time to see health professional	0.00245
	(0.00571)		(0.00322)
SES (Consumption quintiles, ref : Poorest quintile)		Health facilities which were considered as providing high quality care (ref: low quality care)	0.155**
2nd quintile	0.00280		(0.0660)
	(0.0522)		
3rd quintile	0.00188	Religion of the head (ref: Muslim)	
	(0.0475)	Orthodox Christian	0.111
4th quintile	-0.00571		(0.0844)
	(0.0490)	Protestant	0.208*
Richest quintile	-0.00286		(0.124)
	(0.0706)	Other religion or no religion	0.0289
Trust in modern health care (ref: disagree)			(0.169)
Neither agree nor disagree	-0.0647		
	(0.0717)		
Agree	0.00523		
	(0.0730)		
Number of observations	*1,189*		
Pseudo R-squared	*0.2169*		
Log pseudo likelihood	*-627.385*		

Note: Outcome variable is CBHI enrolment status of the household in 2012. All control variables are for the baseline year. The specification also controls for district fixed effects (marginal effects omitted for ease of presentation), which are jointly significant at a 1% level. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1.

Table A5: The impact of CBHI on the probability of outpatient care utilization – District Fixed Effects

Outcome variable:	Fixed effects without covariates			Fixed effects with time varying covariates		
	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts (3)	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts (6)
	(1)	(2)		(4)	(5)	
Share of households using healthcare						
Modern providers	0.1178***	0.0709**	0.1040***	0.0990***	0.0639**	0.0851***
	(0.0221)	(0.0288)	(0.0212)	(0.0229)	(0.0298)	(0.0219)
Public providers	0.1363***	0.1081***	0.1289***	0.1216***	0.0982***	0.1121***
	(0.0203)	(0.0267)	(0.0197)	(0.0208)	(0.0274)	(0.0203)
Private providers	0.0128	-0.0047	0.0094	0.0114	-0.0019	0.0095
	(0.0143)	(0.0204)	(0.0141)	(0.0154)	(0.0219)	(0.0152)
Share of households using public care						
Public health post	0.0063	0.0065	0.0063	0.0023	0.0078	0.0037
	(0.0076)	(0.0117)	(0.0074)	(0.0086)	(0.0120)	(0.0081)
Public health center	0.1265***	0.1162***	0.1249***	0.1130***	0.1014***	0.1089***
	(0.0180)	(0.0222)	(0.0175)	(0.0180)	(0.0226)	(0.0176)
Public hospital	-0.0009	-0.0229**	-0.0057	-0.0021	-0.0217**	-0.0078
	(0.0078)	(0.0103)	(0.0073)	(0.0082)	(0.0105)	(0.0076)
Number of visits						
Modern providers	0.0627***	0.0409**	0.0588***	0.0689***	0.0460**	0.0651***
	(0.0172)	(0.0204)	(0.0159)	(0.0183)	(0.0217)	(0.0165)
Public providers	0.0706***	0.0620***	0.0678***	0.0758***	0.0654***	0.0723***
	(0.0145)	(0.0159)	(0.0140)	(0.0152)	(0.0167)	(0.0145)
Private providers	0.0131	-0.0030	0.0001	0.0058	-0.0002	0.0035
	(0.0071)	(0.0089)	(0.0067)	(0.0082)	(0.0099)	(0.0075)
N	3,555	3,126	4,707	3,369	2,940	4,418

Notes: Standard errors in parentheses are clustered at the village level; *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A6: The impact of CBHI on the probability and intensity of outpatient care utilization, fixed effects with time varying covariates and propensity score matching (balanced panel)

	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts
Five nearest neighbors			
Share of households using health care [a]			
Modern providers	0.081**	0.050	0.074**
	(0.0372)	(0.0392)	(0.0315)
Public providers	0.079**	0.092**	0.090***
	(0.0309)	(0.0386)	(0.0272)
Private providers	0.009	0.006	0.021
	(0.0277)	(0.0358)	(0.0274)
Public health post	-0.002	0.011	0.003
	(0.0084)	(0.0146)	(0.0102)
Public health center	0.096***	0.109***	0.103***
	(0.0251)	(0.0316)	(0.0216)
Public hospital	-0.027*	-0.032**	-0.028**
	(0.0150)	(0.0122)	(0.0114)
Number of visits [b]			
Modern providers	0.044**	0.052**	0.046**
	(0.0234)	(0.0238)	(0.0198)
Public providers	0.048**	0.064***	0.055***
	(0.0183)	(0.0211)	(0.0162)
Private providers	0.012	-0.008	0.005
	(0.0135)	(0.0188)	(0.0145)
Number of observations	*2,851*	*2,202*	*3,676*
Kernel (epanechnikov kernel)			
Share of households using health care [a]			
Modern providers	0.081**	0.035	0.072**
	(0.0353)	(0.0373)	(0.0296)
Public providers	0.084***	0.077**	0.088***
	(0.0286)	(0.0366)	(0.0259)
Private providers	0.008	0.006	0.021
	(0.0260)	(0.0358)	(0.0274)
Public health post	-0.003	0.010	0.002
	(0.0096)	(0.0146)	(0.0105)
Public health center	0.102***	0.093***	0.104***
	(0.0236)	(0.0303)	(0.0210)
Public hospital	-0.027*	-0.031**	-0.029***
	(0.0136)	(0.0123)	(0.0107)
Number of visits [b]			
Modern providers	0.052*	0.047**	0.045**
	(0.0281)	(0.0234)	(0.0196)
Public providers	0.054***	0.060***	0.054***
	(0.0197)	(0.0212)	(0.0157)
Private providers	0.014	-0.009	0.005
	(0.0151)	(0.0186)	(0.0131)
Number of observations	*3,213*	*2,202*	*4,065*

Notes: Fixed effects regressions over common support. Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1; [a] Share of household member that used outpatient care in the two months preceding the survey; [b] Number of outpatient visits per household member in the two months preceding the survey.

Table A7: Inpatient 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**
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: Inpatient care in the 12 months preceding the survey. Standard errors in parentheses are clustered at the village level.

Table A8: The impact of CBHI on the probability of inpatient care utilization (balanced panel)

Outcome variable	Fixed effects without covariates			Fixed effects with time varying covariates			Fixed effects with time varying covariates and matching [a]		
	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts
Share of households using inpatient care from modern providers	0.003 (0.0126)	-0.016 (0.0120)	-0.003 (0.0113)	0.003 (0.0135)	-0.016 (0.0131)	-0.003 (0.0122)	0.026 (0.0219)	-0.010 (0.0154)	0.011 (0.0169)
Share of households using inpatient care from public providers	0.007 (0.0106)	-0.010 (0.00977)	0.001 (0.00945)	0.008 (0.0113)	-0.009 (0.0105)	0.002 (0.0101)	0.031 (0.0214)	-0.003 (0.0130)	0.016 (0.0159)
Share of households using inpatient care from private providers	0.002 (0.0102)	-0.005 (0.0106)	0.001 (0.00938)	0.001 (0.0109)	-0.005 (0.0115)	-0.001 (0.0100)	0.009 (0.0124)	-0.0001 (0.0136)	0.0055 (0.0120)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	2,851	2,202	3,676

Notes: Standard errors in parentheses are clustered at the village level; *** $p<0.01$, ** $p<0.05$, * $p<0.1$. [a] Fixed effects regressions over common support; five nearest neighbor matching.

Table A9: The impact of CBHI on OOP spending for outpatient care and healthcare spending as a share of expenditure (balanced panel)

Outcome variable[a]	Fixed effects with time varying covariates and matching			Outcome variable[b]	Fixed effects with time varying covariates and matching		
	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts		Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts
Consultation and medicine spending	-13.12	-23.09	-18.30	Consultation and medicine spending as share of household monthly expenditure	-0.0041	-0.0078**	-0.0064*
	(14.63)	(18.08)	(14.80)		(0.0037)	(0.0049)	(0.0036)
Transport and other health care	-4.91	2.97	-3.30	Transport and other health care related spending as share of household monthly expenditure	-0.0020	-0.0011	-0.0013
	(5.51)	(4.89)	(4.49)		(0.0016)	(0.0014)	(0.0012)
Total health spending	-18.03	-26.06	-21.60	Total health care spending as share of household *monthly* expenditure	-0.0061	-0.0089	-0.0077*
	(18.62)	(21.21)	(17.97)		(0.0048)	(0.0057)	(0.0044)
Number of observations	*2,851*	*2,202*	*3,676*	*Number of observations*	*2,840*	*2,197*	*3,665*

Notes: Fixed effects regressions over common support; five nearest neighbor matching. Standard errors in parentheses are clustered at the village level; ** p<0.05, * p<0.1. [a] Household's health care spending (in Birr) for outpatient care in the two months preceding the survey. [b] Healthcare spending is for both inpatient and outpatient care services.

Table A10: 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 with time varying covariates and matching [a]		
	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts
Consultation and medicine spending	-4.45	-20.51	-11.32	-6.571	-21.50	-12.29	14.21	-4.02	-3.54
	(23.84)	(22.35)	(21.57)	(26.13)	(25.05)	(23.83)	(25.56)	(27.72)	(23.45)
Transport and other health care	-0.01	-7.81	-2.76	-2.20	-6.70	-2.95	2.86	-1.22	-0.12
	(7.41)	(7.81)	(6.76)	(8.32)	(8.78)	(7.55)	(7.78)	(9.03)	(7.21)
Total health spending	-4.46	-28.31	-14.08	-8.77	-28.20	-15.24	17.06	-2.80	-3.66
	(29.85)	(27.92)	(26.81)	(32.87)	(31.29)	(29.59)	(31.35)	(34.09)	(28.50)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	2,851	2,202	3,676

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] Fixed effects regressions over common support; five nearest neighbor matching.

Table A11: 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 with time varying covariates and matching [a]		
	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts
Consultation/medicine spending is at least 5% of household monthly expenditure	-0.022 (0.0212)	-0.062*** (0.0201)	-0.041** (0.0191)	-0.013 (0.0226)	-0.056** (0.0222)	-0.035* (0.0205)	-0.027 (0.0242)	-0.065** (0.0284)	-0.044** (0.0211)
Transport/other health care related spending is at least 5% of household monthly expenditure	-0.006 (0.0123)	-0.007 (0.0109)	-0.008 (0.0107)	-0.007 (0.0133)	-0.008 (0.0117)	-0.010 (0.0113)	-0.0186 (0.0170)	-0.006 (0.0139)	-0.012 (0.0124)
Total health care spending is at least 5% of household monthly expenditure	-0.023 (0.0224)	-0.058*** (0.0207)	-0.042** (0.0196)	-0.016 (0.0241)	-0.054** (0.0229)	-0.037* (0.0213)	-0.022 (0.0320)	-0.058** (0.0291)	-0.030 (0.0266)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	2,851	2,202	3,676

Notes: Healthcare spending is for both inpatient and outpatient care services. Standard errors in parentheses are clustered at the village level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$; [a] Fixed effects regressions over common support; five nearest neighbor matching.

Table A12: 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 with time varying covariates and matching [a]		
	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts
Consultation/medicine spending is at least 10% of household monthly expenditure	0.002 (0.0157)	-0.015 (0.0163)	-0.007 (0.0148)	0.004 (0.0165)	-0.013 (0.0172)	-0.005 (0.0155)	-0.006 (0.0148)	-0.007 (0.0223)	-0.012 (0.0159)
Transport/other health care related spending is at least 10% of household monthly expenditure	-0.004 (0.0070)	-0.004 (0.0072)	-0.006 (0.0066)	-0.004 (0.0074)	-0.005 (0.0076)	-0.007 (0.0069)	-0.009 (0.0085)	-0.011 (0.0082)	-0.007 (0.0072)
Total health care spending is at least 10% of household monthly expenditure	-0.005 (0.0167)	-0.023 (0.0165)	-0.015 (0.0152)	-0.003 (0.0176)	-0.021 (0.0177)	-0.014 (0.0160)	-0.022 (0.0174)	-0.018 (0.0227)	-0.024 (0.0170)
Number of observations	3,555	3,126	4,707	3,369	2,940	4,418	2,851	2,202	3,676

Notes: Healthcare spending is for both inpatient and outpatient care services. Standard errors in parentheses are clustered at the village level. [a] Fixed effects regressions over common support; five nearest neighbor matching.

Table A13: Cost of healthcare care, balanced panel, conditional on health care use in all survey years

	CBHI pilot districts						Non-CBHI pilot districts		
	Insured households			Uninsured households					
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Modern care price	54.2	61.7	21.9	36.0	47.6	76.0	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: Cost of outpatient care is defined as a household's payment for health - consultation and medicine (in Ethiopian Birr) - per outpatient visit in the two months preceding the survey.

Table A14: 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: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts	Control hh: pilot districts	Control hh: non-pilot districts	Control hh: pilot and non-pilot districts
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: Standard errors in parentheses are clustered at the village level; *** p<0.01, ** p<0.05, * p<0.1. Cost of outpatient care is defined as a household's payment for health - consultation and medicine (in Ethiopian Birr) - per outpatient visit in the two months preceding the survey.

Table A15: Comparing changes in outpatient care use between the two control groups
(difference-in-differences, only for households in the balanced panel)

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

Note: Outpatient utilization in the two months preceding the survey. Robust standard errors in parentheses, **p<0.05.

Table A16: The impact of CBHI on the probability of outpatient care utilization (multiple hypothesis testing)

Outcome variable:	Fixed effects without covariates			Fixed effects with time varying covariates		
	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts
	(1)	(2)	(3)	(4)	(5)	(6)
Share of households using healthcare						
Modern providers	**0.101***	0.0600**	**0.0797***	**0.107***	0.0580*	**0.0787***
	(0.001)	(0.045)	**(0.005)**	**(0.001)**	(0.064)	**(0.0067)**
Public providers	**0.108***	**0.0856***	**0.0985***	**0.114***	**0.0821***	**0.0983***
	(0.0002)	**(0.002)**	**(0.0002)**	**(0.00009)**	**(0.005)**	**(0.0003)**
Private providers	0.0243	0.00999	0.0172	0.0233	0.00839	0.0149
	(0.245)	(0.668)	(0.387)	(0.304)	(0.743)	(0.494)
Share of households using public care						
Public health post	0.0102	0.0102	0.00968	0.00648	0.00909	0.00767
	(0.333)	(0.377)	(0.323)	(0.557)	(0.460))	(0.454)
Public health center	**0.109***	**0.105***	**0.108***	**0.110***	**0.0995***	**0.106***
	(0.000005)	**(0.00003)**	**(0.000002)**	**(0.000002)**	**(0.00005)**	**(0.000001)**
Public hospital	-0.0178	**-0.0324***	-0.0239**	-0.0117	-0.0310***	-0.0220*
	(0.143)	**(0.003)**	(0.028)	(0.351)	(0.007)	(0.051)
Number of visits						
Modern providers	**0.0620***	0.0436**	**0.0554***	0.0624***	0.0376*	0.0516***
	(0.006)	(0.027)	**(0.003)**	(0.009)	(0.075)	(0.008)
Public providers	**0.0628***	**0.0542***	**0.0589***	**0.0675***	**0.0535***	**0.0595***
	(0.0003)	**(0.001)**	**(0.0001)**	**(0.0002)**	**(0.001)**	**(0.0001)**
Private providers	0.0160	0.00452	0.00938	0.0140	0.000386	0.00639
	(0.162)	(0.682)	(0.356)	(0.267)	(0.977)	(0.583)
N	3,555	3,126	4,707	3,369	2,940	4,418

Notes: P-values in parentheses, clustered at the village level; statistical significance: *** p<0.01, ** p<0.05, * p<0.1. Figures in bold remain statistically significant after Holm-Šidák adjustment for multiple hypothesis testing.

Table A17: The impact of CBHI on out-of-pocket spending for outpatient care (multiple hypothesis testing)

Outcome variable	Fixed effects without covariates			Fixed effects with time varying covariates		
	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts
	(1)	(2)	(3)	(4)	(5)	(6)
Consultation and medicine spending	-14.51	-30.05**	-22.39*	-11.04	-27.56*	-20.07
	(0.281)	(0.031)	(0.082)	(0.429)	(0.074)	(0.141)
Transport and other healthcare	-2.619	-3.49	-3.28	-2.23	-3.21	-3.23
	(0.544)	(0.369)	(0.411)	(0.627)	(0.442)	(0.445)
Total health spending	-17.13	-33.53**	-25.67	-13.27	-30.77*	-23.30
	(0.298)	(0.043)	(0.101)	(0.438)	(0.091)	(0.159)
Share of household monthly spending	-0.004	-0.01**	-0.01*	-0.002	-0.01**	-0.01
	(0.336)	(0.017)	(0.064)	(0.598)	(0.039)	(0.134)
OOP spending > 5% budget share	-0.02	**-0.06***	-0.04**	-0.02	-0.05**	-0.04*
	0.303)	**(0.003)**	(0.034)	(0.566)	(0.013)	(0.091)
N	3,555	3,126	4,707	3,369	2,940	4,418

Notes: Outpatient spending (Ethiopian Birr) in the two months preceding the survey. P-values in parentheses, clustered at the village level; statistical significance: *** p<0.01, ** p<0.05, * p<0.1. Figures in bold remain statistically significant after Holm-Šidák adjustment for multiple hypothesis testing.

Table A18: Cost of healthcare care conditional on healthcare use (unbalanced panel; multiple hypothesis testing)

Outcome variable	Difference-in-differences without covariates			Difference-in-differences with covariates		
	Control: pilot districts	Control: non-pilot districts	Control: pilot and non-pilot districts	Control: pilot districts	Control: non-pilot districts	Control: 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*****
	(0.046)	**(0.004)**	**(0.002)**	(0.016)	(0.007)	**(0.003)**
N	*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*****
	(0.009)	**(0.002)**	**(0.0006)**	(0.009)	**(0.002)**	**(0.0004)**
N	*1,002*	*857*	*1,256*	*927*	*792*	*1,156*
Private care price	-16.39	-83.85	-50.89	-15.57	-131.56	-62.31
	(0.648)	(0.162)	(0.218)	(0.655)	(0.120)	(0.208)
N	*337*	*327*	*475*	*326*	*301*	*443*

Notes: Cost of outpatient care is defined as a household's payment for healthcare - consultation and medicine (Ethiopian Birr) - per outpatient visit in the two months preceding the survey. P-values in parentheses, clustered at the village level; statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Figures in bold remain statistically significant after Holm-Šidák adjustment for multiple hypothesis testing.