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WHAT IS A HEALTH CARD WORTH? AN EVALUATION OF AN OUTPATIENT HEALTH INSURANCE PRODUCT IN RURAL INDIA

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WHAT IS A HEALTH CARD WORTH? AN EVALUATION OF AN OUTPATIENT HEALTH INSURANCE PRODUCT IN RURAL INDIA[1]

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ABSTRACT

Low-income rural Indians have poor access to quality healthcare services in their vicinity, insufficient usage of preventive products, and a paucity of health financing schemes, leading to poor health outcomes and high out-of-pocket health expenditure.

In 2009, a pilot project was implemented by CARE Foundation in which low-skilled resident Community Health Workers (CHW) were trained and deployed in 50 villages in Yavatmal in Maharashtra, India, to offer first-level primary and preventive care consultations. After screening the patients and gathering information, the CHWs used mobile phones to consult with a doctor in a nearby town, and either made referrals to the doctor, or prescribed another appropriate course of action as required by the case. The CHWs further sold an outpatient health insurance product and a range of preventive products. The insurance did not cover hospitalization.

This paper presents the findings of a randomized controlled trial that evaluated the impact of the initiative on the targeted population. We found that people with the health insurance card that permitted cashless visits to the CHWs had different outcomes compared to people who visited the CHWs without insurance (paying a modest Rs.12 ($0.24) per visit). Households assigned to the treatment group in our study had substantially higher number of visits to the CHWs, and more referrals to the doctor and to hospitals. We also found that the insurance only group spent fewer days on a hospital bed, and spent less out-of-pocket on hospitalization expenses. Our interpretation is that the insurance product incentivized frequent visits to the CHWs, leading to earlier identification of illnesses and more timely referrals to a hospital where the patient could get treated at an earlier stage, and hence at a lower cost. We conclude that while there is need for further research, insurers as well as government agencies deploying hospitalization insurance schemes could benefit if the inpatient cover was bundled with outpatient insurance, as it could reduce claims ratios, improve financial viability, and enhance future enrolment rates.

1. INTRODUCTION

Access to healthcare, health outcomes, and illness-related financial burden among rural households are major areas of concern for India's health policymakers.

There is limited physical access to good quality health services in rural areas. Public health facilities are adversely affected by high rates of absenteeism, unfilled posts for doctors and medical personnel, inadequacy of complementary inputs such as drugs, and long waiting times (Banerjee, Deaton & Duflo, 2004; Muralidharan, Chaudhury, Hammer, Kremer, & Rogers, 2011). Not surprisingly, recent studies also show that rural populations are dissatisfied with the public health services that are available locally to them (Kumari et al., 2009). Good quality private services are limited as well, mostly because people living in rural areas, especially the poor, cannot afford high out-of-pocket health expenses. Rural areas also lack amenities such as schooling, electricity and entertainment, which limits their attraction to healthcare providers, (Dussault & Franceschini, 2006; Lindelow & Serneels, 2006) leading to poor rural populations relying on under-qualified private providers (Banerjee et al., 2004). Approximately 78% of all rural healthcare visits reported in the National Sample Survey on Healthcare Utilization and Expenditure in 2004 (NSSO, 2004) were made to private providers. One outcome of poor access to local providers is that rural populations sometimes forgo necessary care. Data from the 2004 household survey of the National Sample Survey Organization reveals that 18% of people in rural areas reporting ill

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in the two weeks preceding the survey did not seek treatment (compared to 11% in urban areas). The proportion of population that did not seek treatment was even higher (approximately 23%) when only the poorest 20% of the rural population were considered.

Health outcomes, particularly those contingent on primary and preventive care, are poor in India, with the worst affected being children and women. Of the 9.7 million under five deaths in the world every year, 25% occurs in India. Nearly one million children in India die within one month of their birth. Of the 26.3 million un-immunized children in the world, 43% reside in India[3]. Sixty percent of all global measles deaths occur in India. According to World Health Report (2007), 60% of all polio cases, 22% of maternal deaths and 40% of underweight children below five years of age in the world are in India. Health outcomes depend on multiple factors, many outside the ambit of the health sector (Commission on Social Determinants of Health, 2008[4]; Jamison et al., 2006). The limited availability of good quality water, poor sanitation, low levels of female literacy, early marriage, shorter birth intervals, and indoor pollution adversely affect the health of children and women in rural areas.

However, even after taking into account these other factors, prevention services, ante-natal care and basic curative care are highly cost-effective in influencing population health outcomes (Bärnighausen et al., 2011; Bärnighausen, Bloom, Cafiero, & O'Brien, 2012; Jamison et al., 2006). The provision of effective preventive and curative care thus remains a key issue in India's healthcare delivery system.

With out-of-pocket (OOP) health expenditure in India making up 78% of total health spending and 94% of all private health spending, it is one of the highest in the world (Rao, Selvaraju, Nagpal & Sakthivel, 2005). Given this scenario, low-income households that experience ill-health are faced with considerable expenses. Hospitalization expenses, in particular, cause catastrophic financial burden. One quarter of all Indians who are hospitalized each year fall below the poverty line due to the financial burden of hospitalization (Peters et al., 2002). The recent introduction of publicly funded hospital insurance schemes such as the *Rashtriya Swasthya Bima Yojana* (RSBY) and various state-led initiatives have likely lowered the financial risks of hospitalization for the poor (Fan, Karan, & Mahal, 2012). However, the poor in India still face considerable risk of health expenditure because the population coverage of the schemes have thus far been limited, and also because they only cover inpatient care (Mitchell, Mahal, & Bossert, 2011). Few programmes in India focus on outpatient care, although the per capita outpatient expense of BPL individuals (at Rs.30.1) is more than twice their inpatient expense (Rs.14)[5].

Recently, there have been government initiatives aimed at addressing the shortcomings of the public sector health service delivery for rural areas under the National Rural Health Mission. One strategy employed is the use of non-physicians to offer preventive and primary care. To create community buy-in, and also to serve as a bridge to public services, state governments have promoted community health workers (CHWs) such as Accredited Social Health Activist (ASHA) workers, originating from and based in the villages of the target populations. Currently, there are 866,251 ASHA workers in addition to 1.8 million *Anganwadi* workers and 207,868 Auxiliary Nurse Midwives as per data from the National Rural Health Mission[6]. However, CHWs in government programmes have not been very effective in India. The key problems include low motivation levels (inadequate reward structures, lack of support from higher-order providers), limited oversight (no accountability to community) and limited skill sets. Their focus on prevention also exists in tension with rural households' need for basic curative care and drugs (Bajpai & Dholakia 2011; Lehmann & Sanders 2007). Nevertheless, the CHW model is part of the Government of India's strategy for providing universal health coverage[7].

Providing training, monitoring quality, and providing support to a large number of geographically spread out CHWs is an onerous task for the Departments of Health. The application of mobile and wireless technologies in healthcare (mHealth) offers an opportunity to address some of these challenges in remote rural areas. A survey conducted in 114 countries by the World Health Organization[8] in 2011 found that 83% of the countries had some form of mHealth in place, including consultations between remotely located health professionals, uploading and storing of electronic patient records, use of decision-tree type diagnostic and treatment algorithms, and other support systems. Such technologies can help CHWs and other remotely located health workers to benefit from real time consultation with doctors located in urban areas, and enable the sharing of patient medical information with the doctors. Putting such systems in place also enhances the overall motivational levels and credibility of rural health workers by facilitating appropriate care of good quality.

[3]http://www.tribuneindia.com/2008/20080302/spectrum/main1.htm.
[4]http://whqlibdoc.who.int/publications/2008/9789241563703_eng.pdf.
[5]Estimated from NSSO Round 66 unit data at 2009-10 prices.
[6] http://www.mohfw.nic.in.
[7] Report by the High Level Expert Group, Planning Commission, retrieved from http://planningcommission.nic.in/reports/genrep/rep_uhc0812.pdf.
[8] http://www.who.int/goe/publications/goe_mhealth_web.pdf.

In 2009, CARE Foundation (CARE) implemented an innovative health service model on a pilot basis in 50 villages of Yavatmal district of Maharashtra. The programme aimed at improving the access of the rural poor to preventive and primary care services by employing trained CHWs in each village. The CHWs were trained to screen patients and provide preventive and primary care in consultation with a general practitioner located in Yavatmal town, using a mobile phone. The CHWs also provided basic over-the-counter drugs to the patients. Based on the doctor's advice, the CHW could further refer the patient to a CARE clinic in town if needed. The key innovation was the introduction of a voluntary prepaid card (also referred to as health card or outpatient insurance in this paper) that covered unlimited visits to the CHW and doctor. Costing Rs.300 ($6), the card covered four members of a household and allowed cashless usage of consulting services, as well as drugs and tests, for which there was a limit of Rs.2,500 ($50). The CHW also conducted health awareness campaigns and sold a set of preventive products (PP) such as handkerchiefs, soaps, water purifier tablets, mosquito repellents, and sanitary napkins.

In this paper, we present the results of a randomized controlled trial evaluation of specific components of the CARE programme. The evaluation focused on (a) the impact of the prepaid health card; and (b) the impact of the combined intervention that included the prepaid card and PP products on parameters like OOP health spending, health seeking behaviour, morbidity, and health outcomes.

This paper makes a contribution to the development economics literature as follows. The existing literature (discussed in the results section) largely focuses on evaluations of government financing schemes that cover inpatient and outpatient care using quasi-experimental methods. This is the first evaluation of the isolated impact of an outpatient insurance product in a developing country setting that we are aware of. The study also sought to establish the links between primary care insurance and its impact on hospitalization rates. While there are some papers in the medical literature that discuss the benefits of timely primary and preventive care in reducing hospitalization (in addition to plenty of anecdotal evidence) there is a paucity of rigorous evaluations of programmes from this perspective in the development economics literature.

The remainder of this paper is organized as follows - Section II describes the intervention; Section III describes the data and experiment design; Section IV presents the empirical strategy; Section V presents the results; Section VI discusses the results in the context of the literature; and Section VII concludes with policy recommendations.

2. DESCRIPTION OF THE INTERVENTION AND CONTEXT

The CHW programme was launched in 2009 in 50 villages of Yavatmal district, a poor, drought-prone district in the western state of Maharashtra in India. It was launched by CARE Foundation, the not-for-profit arm of the Cardiac Research and Education Hospitals headquartered in Hyderabad, India, which has a focus on rural health interventions. The programme was implemented in collaboration with the Centre for Insurance and Risk Management (CIRM), and was funded by ILO's Microinsurance Innovation Facility. Yavatmal district was selected because of the potential demand for health services based on the poor development indicators of this district. The presence of a large Tertiary care hospital operated by CARE in the neighbouring district of Nagpur also factored in favourably in the choice of Yavatmal.

The Intervention

CARE deployed a CHW in each of 50 selected villages. The CHWs offered basic medical consultation to the rural population, and assisted with transportation in the case of emergencies. They also sold a small set of generic drugs and followed up with patients. Twice a week they also conducted health and hygiene awareness rounds of the villages, especially targeting adolescent girls and discussing their health needs.

The CHWs conducted a basic medical examination of visiting patients, noted their details and symptoms, and consulted a doctor for further course of action using a mobile phone. If required, the patient would be referred to the doctor at the CARE primary clinic. The network of CHWs in the villages was supported by a primary care center located in Yavatmal town, in a hub and spoke model. The primary care center was staffed by a doctor, a pharmacist, a medical assistant, and a lab technician. The doctor would in turn refer patients to specialists in Yavatmal town, or to the CARE Hospital in Nagpur if necessary. The CHWs adhered to a documented decision tree for handling each patient (see Appendix A3 for details), with referrals being guided by the doctor. The administrative data from CARE revealed that CHWs, on average, handled 75% of patient visits, while 25% were referred to the doctor. Until the introduction of the prepaid health card in 2010, households in the village could use the services of the CHW for a fee of Rs.5 ($0.10) per visit, and consult the physician in the CARE clinic for Rs.12 ($0.24). All patients (regardless of whether they were prepaid card holders or not) were offered a 25% discount when referred to the CARE hospital by the primary care clinic. This model sought to provide quality services in the village, while

efficiently using the services of the scarcest resource, the doctor.

The CARE training team for CHWs was based in Hyderabad and comprised a training manager (a medical doctor with an undergraduate degree in medicine) and 10 other members who were either qualified doctors or had an undergraduate degree in nursing. The typical CHW selected for training is a married female resident of the village, aged about 30 years, with ten years of schooling. The average household income of the CHWs was Rs.3,730 ($75) per month. For a third of the CHWs, this was their only occupation, and very few had prior medical experience. Training programmes were staggered over 17 days, and included an induction training component (consisting of basics of disease symptoms, hygiene, communication skills, enrolment, etc.), physical examination methods (measuring weight, height, blood pressure and updating records), revision training (reviewing the lessons of previous training), and rotation training where the CHWs examined patients in the primary care facility in the presence of a doctor (See Appendix A2 for details).

The specific components of the intervention that we evaluated consisted of (a) the prepaid card for financing health visits to the CHW and referral visits to the CARE primary care clinic in Yavatmal; and (b) the composite intervention including the prepaid card and the sale of PP products by the CHW that had a primarily preventive purpose.

The prepaid card, called the *Arogya* (health) card, was also sold by the CHWs. The cost of the card was Rs.300 ($6) per annum for a family of four (two parents and two children between the ages of 6 months and 65 years). It offered a maximum benefit of Rs.2,500 ($50). Other family members could be covered optionally for an additional premium ranging from Rs.40 ($0.8) to Rs.100 ($2) depending on age[9]. The card entitled its holders to cash-free visits to the CHW and to the primary care clinic in Yavatmal, basic diagnostic services at the clinic, and medicines. Cardholders were also provided a transportation allowance of Rs. 200 ($4) if referred to the CARE Hospital in Nagpur, although the hospital charges were not covered. Since the prepaid card was equivalent to outpatient insurance, we use the term 'outpatient insurance' interchangeably with the terms 'prepaid card' and 'health card' in this paper. The product was priced lower than its actuarially fair premium, which was estimated by CARE Foundation to be Rs.600. The CHWs were paid a commission of Rs.10 ($0.20) for the sale of each health card, and a fixed fee of one rupee ($0.02) per active health card per month. They received Rs.5 ($0.10) as consultation fees for each uninsured patient visit, and Rs.2 ($0.04) for blood pressure/weight/height checks, but no fees for treating an insured patient to discourage collusion. The CHWs also received a modest commission on the sale of PP products like handkerchiefs, soap, water purifier tablets, mosquito repellents, and sanitary napkins.

Prior to the formal introduction of the programme, CARE and CIRM undertook a qualitative study to gather information on morbidity, the composition of morbidity (e.g., commonly prevalent diseases), health seeking behaviour, the available public and private medical infrastructure, sanitary practices, willingness to pay, and health-related concerns of the rural population in Yavatmal district in order to understand the issues faced by them, and to design the intervention appropriately. Overall health awareness was found to be low, with poor sanitary and preventive practices. There was also a strong need to contain malaria and water borne diseases in the district.

Apart from the qualitative study, a formal baseline survey was also carried out among a sample of households in the study villages to assess people's common sources of morbidity, treatment seeking behaviour, and OOP spending on healthcare. The baseline survey conducted for the evaluation confirmed the low economic status and poor health indictors of the selected pilot villages. The average annual household consumption for our sample was Rs.38,000 ($760). Only 50% of the total sample population had completed primary schooling. About one sixth of the sampled households had to travel 15 minutes or more to access drinking water, while only one fifth had a toilet in their homes, with the rest defecating in open spaces. Ninety-one percent used wood for cooking, and almost all of them cooked indoors. Only 31% of the households used some form of protection against mosquito bites, such as bed-nets or mosquito repellents. In general, awareness of 'good' health practices and preventive behaviour (e.g., hand washing with soap) was low.

The baseline survey also revealed that fever, malaria, and diarrhoea were common ailments along with persistent cough, backache, and joint pain. Hospitalization rates were high with 9.8% of the households reporting a hospitalization in a six-month reference period. The rural population in Yavatmal district lacked physical access to basic curative health services, and the use of informal service providers (quacks) was common. These comprised 'registered' medical practitioners (93% of respondents seeking health services visited this category of provider in a one year reference period), as well as other unqualified doctors (49% of those seeking care in the survey reference period used this provider at least once in a one year period). Private providers accounted for 65% of all outpatient visits in the study

[9] See Appendix A1 for detailed product terms.

region. OOP outpatient expenses accounted for nearly 80% of all OOP health spending by households in the baseline survey, averaging Rs.370 ($7.4) per household per month. Transportation, lost income on account of travel, time, and other incidental expenses accounted for 32% of illness-related expenses.

Marketing and enrolments

A number of marketing campaigns were conducted periodically in the district. Each CARE coordinator visited four to five villages two to three times a week for door-to-door marketing, and to encourage enrolment. Further, CARE conducted a periodic marketing event called "magic box". As part of this event, the households were made aware of the benefits of the prepaid card, and then encouraged to participate in a lottery game. A box containing paper slips with different discounts ranging from 10 to 100% written on them was placed before the participants. Households participating in this game could avail the discount that they picked to purchase the health card. Additionally, CARE also targeted Self Help Groups. A 10% discount was offered for bulk enrolment of group members.

3. METHODOLOGY AND DATA

CARE, CIRM, and ILO sought to assess the impact of the prepaid health card scheme as well as the availability of the PP products with the CHWs on health seeking behaviour, morbidity, and OOP health expenses.

The underlying thesis was that the availability of a prepaid card would increase the likelihood of visits to the CHW and to the CARE primary care clinic, since the marginal cost of a CHW visit for a cardholder was low compared to a non-cardholder, and the quality of care provided by the CHW was expected to be superior compared to alternatives like public facilities and unqualified providers. However, it was not clear whether the increase in the number of visits to the CHW could outweigh the decline of visits to alternate sources. Availability of insurance was also expected to encourage earlier visits to the CHW, at the initial stages of onset of illness. The above two factors were expected to reduce the duration of illnesses needing outpatient care. While it was expected that some illnesses could be prevented from turning into hospitalization cases with timely outpatient care (thereby reducing the frequency and intensity of inpatient cases), the improved access to the CHW could have also led to increased referrals to a hospital.

Earlier detection and recovery from illness along with the subsidized premium, was expected to reduce OOP outpatient expenses, while proximity to the CHWs would reduce incidental expenses. Overall inpatient expenses were also expected to decline if the drop in frequency and duration of hospitalization offset any increased referrals to hospital.

The introduction of the PP products for sale by the CHW was expected to reduce the incidence of preventable air and water borne contagious diseases, while the discount offered on the products was expected to increase their usage. Improved morbidity rates could lead to lower health expenses, increased number of productive hours, fewer school or work days lost due to illness, or due to the accompaniment of an ill family member. However, the increased interactions between households and CHWs may in turn lead to increase in treatment-related visits and exposure to public health messages disseminated by the CHW. Thus the direction of the effect in terms of the total number of healthcare visits as a result of the interventions was uncertain.

Randomization Design

We randomized the households in each village (across multiple villages) and used discounts to encourage higher take-up in the treatment groups compared to the control group, which is in the same village. In a sense, this is similar to a matched pair design, where the matching criterion is the village. This approach has the benefit of higher statistical power, smaller sample size, lower cost of data collection, and avoids excluding anyone from the intervention. The intervention was launched on a pilot basis in 50 villages in two batches, with 30 in the first, and 20 subsequently. We selected the first batch of 30 villages for this study. We conducted a village listing, and randomly drew 30 households in each village. We then randomly assigned the 30 households to three equal sized groups. All groups had access to all of the CHWs' services. The control group, C, received a one-time free visit to the CHW to promote an initial visit to experience the service, its quality and operational details so that we could isolate and study the impact of the insurance alone compared to the pay-per-use model. Else, if the control group was not familiar with the service at all, we could have ended up comparing the impact of the access to the service, as well as the insurance component on the treated group, to a control group that has access to neither. The control group had the option to purchase the insurance in future, or simply to visit the CHW without insurance on a pay-per-use basis. The treatment group T1 received an 80% discount voucher on the insurance premium, and another 80% discount voucher on the PP package. Treatment group T2 received only an 80% discount voucher on the insurance to use the CHW. The price was not set to zero since field experiences suggested that people might not value a free product.

To summarize the assignments:

- Treatment group T1: Access to CHW; discount on insurance; discount on PP package
- Treatment group T2: Access to CHW; discount on insurance; no discount on PP package
- Control group C: Access to CHW; access to insurance; access to PP package with no discounts at all

The non-transferrable discount vouchers were given to the selected households immediately after the completion of the baseline interview. There were no additional marketing campaigns or encouragements for the voucher recipients, and they were exposed to the same marketing as the other village residents.

We exploited the fact that the households from the groups with the discounts would have more purchases than the ones without. Hence the treatment groups were "more treated" than the control group, which had access to the CHW, insurance, and the PP products, but at full price. In this study, the impact is observed through two comparisons:

1. T1 vs. C: measures the impact of the bundled OP insurance plus PP package
2. T2 vs. C: measures the impact of OP insurance only

We acknowledge that the results of this study may be applicable only to those locations where this service is viable, and hence not necessarily generalizable to all villages even within India. In particular, these villages were chosen because of their poor access to health services. It is not clear whether the impact would be higher or lower in these villages compared to the median Indian village.

Data

The baseline survey was conducted between November 2010 and February 2011 on 889 households. We tried to re-survey these households in the endline survey conducted between November and December of 2011, approximately a year after the insurance product was launched.

Four out of the original 30 villages (a total of 129 households) did not have the service as the CHWs dropped out due to lack of support from the local community. This does not by itself introduce imbalance between groups, since groups are matched by village. Moreover, given that the dropout rate is only 13%, the results are potentially still applicable to a large population in India. We administered the endline in these four villages as well, but we dropped these observations in the main difference-in-differences (DiD) estimates.

A total of 27 households migrated permanently, and hence could not be interviewed for the endline. This left us with 743 endline observations. The baseline and endline surveys were almost identical, except for additional questions regarding the intervention in the endline. A different survey company was hired for each round. Questions in the surveys covered illnesses and details of health seeking behaviour for a 30 day recall period (to aid better recollection), and also details of major illnesses (malaria, diarrhoea and infant illnesses) for a six-month recall period. Hospitalization incidences and entailing expenses were recorded for a six-month recall period. Health expenses were recorded for the illnesses that occurred during the one-month (by type of expense), six month, as well as one-year recall periods.

In sum, we have in the 26 treatment villages, 770 observations in the baseline, and 743 in the endline after attrition (Table 1).

Table 1: Sample size in the treatment villages

Voucher Code	Endline	Baseline
Insurance plus PP	249	260
Insurance only	244	253
Control	250	257
Total	743	770

The individual dropouts due to migration may have affected the study if they were predominantly from one group, decreased sample size considerably, or if the characteristics of the dropouts were different in each group, thereby making the groups different from each other. However, the dropouts due to migration were evenly spread across all the groups. Table 2 shows the means and differences in baseline characteristics between the dropouts and the non-dropouts. Only hospitalization expense is different. However the main consideration is whether the dropouts caused the three groups to become unbalanced post dropout. There are no systematic differences in the dropped observations between the groups.

Table 2: T-test Baseline household characteristics - Mean Endline Participants vs. Mean Dropouts

	Non-dropout	Dropout	Difference
Household size	4.464	4.296	0.168
	(1.740)	(1.836)	(0.49)
Was immunized	0.276	0.370	-0.0945
	(0.447)	(0.492)	(-1.07)
Household has tap water	0.401	0.481	-0.0804
	(0.490)	(0.509)	(-0.84)
Has pucca house	0.207	0.259	-0.0520
	(0.406)	(0.447)	(-0.65)
Has ration card	0.844	0.815	0.0291
	(0.363)	(0.396)	(0.41)
Age of respondent in years	47.55	47.85	-0.297
	(13.28)	(15.75)	(-0.11)
Was hospitalized in past 6 mths	0.0956	0.148	-0.0526
	(0.294)	(0.362)	(-0.90)
No. of days in hospital in past 6 mths	0.746	0.963	-0.217
	(3.569)	(2.564)	(-0.31)
Total hospital expenses in past 6 mths (Rs.)	539.5	2500	-1960.5***
	(2622.6)	(7996.4)	(-3.37)
All OP health expenses in 1 mth	488.8	497.8	-8.977
	(2365.7)	(1149.1)	(-0.02)
Sought health provider in past 1 mth	1.164	1.259	-0.0951
	(1.186)	(1.457)	(-0.41)
No. of episodes of illness in past 1 mth	9.634	9.296	0.338
	(3.804)	(4.471)	(0.45)
No. times sick in past 6 mths	0.306	0.444	-0.139
	(0.646)	(1.086)	(-1.07)
Self reported health ranking out of 5	16.27	15.81	0.454
	(8.120)	(8.753)	(0.28)
Observations	743	27	770

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The premise of comparing control and treatment groups in a randomized controlled trial experiment is that since treatments were randomly assigned, the groups are likely to be similar in any characteristic that might influence outcomes, and hence any difference in outcomes can be attributed to the treatment. As we see in Table 3, the insurance only group had significantly higher rates of immunization and access to tap water.

The other baseline outcome variables of interest after excluding the endline observations lost due to attrition and dropped villages-are presented in Table 4. There is imbalance in two variables in each of the treatment groups, which although unfortunate, is not unexpected given our small sample size. Both the groups are different in "Sought Health Provider", group 1 is different in "Self reported health ranking out of 5", while group 2 is different in "No. of times sick in past 6

months". We discuss our efforts to account for these imbalances in the results section.

Table 3: Means of baseline control variables by group

	Insurance plus PP	Insurance only	Control	Difference: Control minus T1	Difference: Control minus T2
Household size	4.357	4.430	4.604	0.247	0.174
	(1.754)	(1.750)	(1.714)	(1.59)	(1.11)
Was immunized	0.289	0.311	0.228	-0.0612	-0.0835**
	(0.454)	(0.464)	(0.420)	(-1.56)	(-2.10)
Household has tap water	0.402	0.455	0.348	-0.0536	-0.107**
	(0.491)	(0.499)	(0.477)	(-1.24)	(-2.43)
Has pucca house	0.217	0.201	0.204	-0.0129	0.00318
	(0.413)	(0.401)	(0.404)	(-0.35)	(0.09)
Has ration card	0.839	0.820	0.872	0.0326	0.0523
	(0.368)	(0.385)	(0.335)	(1.04)	(1.61)
Age of respondent in years	47.25	46.72	48.67	1.412	1.944
	(13.72)	(13.07)	(13.00)	(1.18)	(1.65)
No. members under 10	4.249	3.676	3.468	-0.781	-0.208
	(7.297)	(5.869)	(6.069)	(-1.30)	(-0.39)
Max. education level in household	141.5	139.7	149.9	8.476	10.23
	(226.9)	(219.6)	(236.2)	(0.41)	(0.50)
Observations	249	244	250	499	494

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Baseline randomization checks on outcome variables

	Insurance plus PP	Insurance only	Control	Difference: Control minus T1	Difference: Control minus T2
Was hospitalized in past 6 mths	0.0924	0.115	0.0800	-0.0124	-0.0348
	(0.290)	(0.319)	(0.272)	(-0.49)	(-1.30)
No. of days in hospital in past 6 mths	0.743	0.893	0.604	-0.139	-0.289
	(3.184)	(3.304)	(4.144)	(-0.42)	(-0.86)
Total hospitalization expense in past 6 mths (Rs.)	548.4	679.3	396	-152.4	-283.3
	(2387.9)	(3295.1)	(2052.8)	(-0.76)	(-1.15)
All OP health expenses in 1 mth	628.0	419.4	417.9	-210.1	-1.530
	(3353.0)	(1152.1)	(2038.5)	(-0.85)	(-0.01)
Sought health provider (past 1 mth)	1.209	1.299	0.988	-0.221**	-0.311***
	(1.120)	(1.323)	(1.088)	(-2.23)	(-2.86)
No. of episodes of illness in past 1 mth	9.502	9.758	9.644	0.142	-0.114
	(3.792)	(3.931)	(3.700)	(0.42)	(-0.33)
No. times sick in past 6 mths	0.309	0.361	0.248	-0.0612	-0.113*
	(0.645)	(0.680)	(0.610)	(-1.09)	(-1.94)
Self reported health ranking out of 5	15.55	16.32	16.94	1.386*	0.616
	(7.787)	(8.171)	(8.363)	(1.92)	(0.83)
Observations	249	244	250	499	494

Enrolment Rates and Usage of Vouchers

Insurance enrolment rates were close to 63% for the treatment groups, compared to 35% for the control group as shown in Table 5. We regressed the decision to enrol on household characteristics, but found that only the discount voucher explained the variable significantly. Further, almost all of those who purchased the prepaid health card only purchased the basic insurance cover for four household members, without enrolling more members at an additional cost.

Table 5: Enrolments and Usage

	Insurance plus PP Group	Insurance only Group	Control Group	Total
Bought CARE health card	0.627	0.643	0.348	0.538
Avg. no. of visits to CHW	1.175	0.892	0.363	0.813
Bought any CARE PP product	0.386	0.168	0.0600	0.205
Bought CARE health insurance and any PP product	0.382	0.164	0.0560	0.201
Observations	249	244	250	743

Usage of the CHWs' services is correlated to the insurance enrolment rates as seen in row two of Table 5, indicating that people who purchased insurance also used it. We also found that 39% of the treatment group T1 purchased at least one PP product from the CHW, compared to 17% from treatment group T2, and only 6% from the control group.

Table 6 shows the different kinds of products purchased by the groups.

Table 6: Purchase of the Preventive Products

	Insurance plus PP Group	Insurance Only Group	Control group	Total
Soap	3.642 (1049)	1.170 (330)	0.398 (115)	1.739 (1494)
Gent's Hankies	0.705 (203)	0.142 (40)	0.0692 (20)	0.306 (263)
Women's Hankies	0.715 (206)	0.167 (47)	0.0588 (17)	0.314 (270)
Water purifier drops	0.240 (69)	0.0355 (10)	0.0208 (6)	0.0990 (85)
Mosquito coil	0.170 (49)	0.0142 (4)	0.0138 (4)	0.0664 (57)
Mosquito Net	0.229 (66)	0.0426 (12)	0.0208 (6)	0.0978 (84)
Mask	0.170 (49)	0 (0)	0 (0)	0.0570 (49)

The top three reasons for purchasing insurance were the expectation of saving money in future, lower cost of using the CHWs for the cardholders, and the recommendation of a friend or relative. The primary reason for buying PP products from the CHW was low cost. The top reasons for not purchasing insurance were lack of understanding of the scheme, and lack of money. The top reasons for not purchasing any PP product were lack of awareness of the product range that CHWs had on offer, and lack of affordability.

Awareness and Attitude Towards the Scheme

In this sub-section, we summarize self-reported awareness and attitudes towards the programme. In Table 7, we see that close to 74% of the respondents

were aware of the CHWs' names, while only 17% have been to the health camp. The average amount that households were willing to pay for the health card was Rs.194 ($3.9). Among those willing to renew their insurance, 50% preferred a one-time payment of premium, while 40% preferred two payments per year.

The popular reasons for wanting to buy a health card the next year were the expectation of saving money (65%) and good service rendered by CHWs (26%), while 9% reported that they would buy because they did not have access to any other service options. The primary reasons for those not wanting to buy or renew their insurance were poor service rendered by CHWs (32%), low anticipation of insurance usage (31%), and unaffordability (13%), while the lack of discounts beyond the study period dissuaded only 4%.

Table 7: Scheme Usage

	Insurance plus PP Group	Insurance only Group	Control Group	Total
Knows CHW's name	0.767	0.758	0.680	0.735
	(0.424)	(0.429)	(0.467)	(0.442)
No. times went to Health Camp	0.189	0.176	0.156	0.174
	(0.654)	(0.613)	(0.556)	(0.608)
Total no. of visits to CHW	1.175	0.892	0.363	0.813
	(1.839)	(1.472)	(1.002)	(1.518)
Will renew Health Card	0.602	0.627	0.372	0.533
	(0.490)	(0.485)	(0.484)	(0.499)
Will buy Health Card	0.205	0.266	0.452	0.308
	(0.404)	(0.443)	(0.499)	(0.462)

Mean coefficients; standard error in parentheses

For the PP products, very little seasonal variations in demand were observed. Products that did exhibit some seasonal variations were Mosquito products during summer (15-20%); water purifier tablets during rains (20%); and handkerchiefs during summer (11%).

Overall, 62% of all the respondents cited private clinics as their preferred healthcare provider, followed by 18% who cited government clinics. Seventeen percent of households preferred the CHW as a medical provider. This number rises to roughly 20% in the treatment groups, compared to 10% in the control group. The top reasons for this preference as shown below are lower price, better quality of doctor, and better service overall. Although the percentage preferring CHWs was small, qualitative studies confirmed that this was not due to the quality of the CHWs being inferior to that of other providers. This was corroborated by the fact that 70% of the endline respondents stated that they liked the quality of the CHWs, and 88% stated that the CHWs' service was at least as good, if not better than other alternatives. Hence the relatively lower preference was not an indictment of the quality of service, as preference is also driven by other factors such as lower price at public facilities. Moreover, the endline survey revealed that patients consulted a number of providers for different needs, and CARE's provider was one of them.

4. EMPIRICAL STRATEGY

Intent to Treat Effect

We focussed on the intent-to-treat effect, i.e., the average effect on those who were in the treatment groups, regardless of whether they purchased the insurance or the PP products, and regardless of whether they used them or not after purchase.

For the outcome variables available in both baseline and endline studies, we used the DiD estimator (Equation 1). A DiD estimate for an outcome variable of interest tells us the difference in the change (from baseline to endline) between the control and treatment groups. For example, we see that hospitalization expenses (in a six-month recall period) dropped from baseline to endline on average for most respondents. The DiD estimate tells us by how much the drop in average hospitalization expenses from baseline to endline of the treatment group is higher than the average drop in hospitalization expenses of

the control group. From this estimate, it can be deduced whether the intervention had any effect or not. However, it is difficult to quantify the magnitude of this effect, since both the control and treatment groups have enrolments, but to varying extents, and hence we are in fact comparing a group with higher insurance enrolment rates with a group that has lower rates. Therefore, the DiD values represent a lower bound to the intent-to-treat effect than we would witness in a hypothetical experiment with perfect compliance where the control group has no enrolments at all and the treatment group has 100% enrolments. We did an endline only comparison for those variables that are not available in the baseline, such as referrals.

$$Y_{HVT} = \alpha + (\beta_{11} + \beta_{12}T)\, VP_{HV} + (\beta_{21} + \beta_{22}T)\, VI_{HV} + \beta_3 T + \beta_4 X_{HV} + V_V + \varepsilon_{HVT} \quad (1)$$

where the subscript H represents household H, V represents the village, and T indicates whether it is the baseline or the endline.

Y is an outcome variable of interest such as number of doctor visits, amount spent on OOP health expenditure, number of days of illness in each spell, school attendance, hours of labour supplied per week, use of quacks, etc. Health outcomes include incidence rates of illnesses and self-reported measure of health.

X is a vector of baseline household level control variables including those that are not balanced between the different groups such as household size, income, immunization rate, availability of tap water, age of respondent, education of respondent, age distribution in household, possession of ration card, and quality of house.

VP = 1 if given a discount voucher code 1 (for insurance and PP) and 0 otherwise; VI = 1 if given a discount voucher code 2 (for insurance only) and 0 otherwise.

T = 1 if the observation is from the endline, and T = 0 if from the baseline

VV is a village level fixed effect, which is important since enrolment rates vary considerably by village.

All outcome variables are summed across all members of the household, regardless of whether a member is insured or not. Standard errors are clustered at the village level.

The coefficients of interest are β12 and β22. They measure the difference-in-differences estimates.

We also conducted a sub-sample analysis since the intervention may have impacted different people differently. We divided each group into two sub-groups, above and below the median of baseline income and morbidity rate (as a proxy for health). We used responses to household expenditure and illness for a one-month recall period. The median of the pooled observations in the baseline in each village was made the cut-off for creating the groups. Each group was then divided into two parts by taking the median value for the village and grouping observations with responses higher than the median and lower than the median to form the two groups.

We also found out heterogeneous effects for the above using triple differences. However, we must note that finding an effect does not necessarily imply that the result is replicable. For example, with respect to an outcome that is higher for wealthier respondents than for poorer respondents, it is quite possible that the difference in outcome is actually governed by some other household attribute that is correlated to wealth.

$$YHVT = \alpha 1 + (\beta 11 + \beta 12T)\, VPHV + (\beta 21 + \beta 12T)\, VIHV + \beta 3T + (\alpha 2 + (\beta 41 + \beta 42T)\, VPHV + (\beta 51 + \beta 52T)\, VIHV) HHV + \beta 6XHV + VV + \varepsilon HVT \quad (2)$$

H, a heterogeneous treatment effect term, is 1 if the household is above the median, and 0 if below in income, past morbidity, or access to medical providers as reported in the baseline.

The coefficients of interest here are β42 and β52. They measure the triple difference, that is, the difference in outcome trend rates between the two heterogeneous parts of the group.

Local Average Treatment Effect

The Local Average Treatment Effect, which is the effect of the product on those who use it, as opposed to that measured on all those who were offered the product, possibly has a greater significance for this specific intervention. We conducted a two-stage least squares regression using the discount vouchers as instruments for take-up of insurance and take-up of PP products. We would expect independent effects of PP, insurance, and their joint effects to be different – thereby giving us three endogenous variables. Fortunately, there were no respondents who purchased only PP products (without purchasing insurance) in the sample. Hence two instruments were sufficient for the independent effects of purchasing insurance, and purchasing both the insurance and PP products.

Inference and Alternate Methods

We have only 26 villages (clusters), which is considered too small by Cameron, Gelbach & Miller (2007), and others for the standard cluster robust standard errors generated by STATA to be reliable for inference. In order to address this, we used critical values for T – tests of significance from a T – distribution with 24 degrees of freedom[10] (Cameron et al., 2007). The results are robust to cluster bootstrapping. We further ran the ANCOVA estimator (Eq. 4 and 5) following the suggestion of McKenzie (2011), who opines that ANCOVA has higher power when there is low correlation between baseline and endline values for many outcome variables (0.1 to 0.4).

$$YHVT1 = \alpha 1 + \beta 11VPHV + \beta 12YHVT0 + \beta 13XHV + VV + \varepsilon HVT \quad (4)$$

$$YHVT1 = \alpha 2 + \beta 21VIHV + \beta 22YHVT0 + \beta 23XHV + VV + \varepsilon HVT \quad (5)$$

where YHVT1 is the outcome variable at endline, YHVT0 is the outcome variable at the baseline, VPHV equals 1 if the observation was in the Insurance plus PP group, and 0 otherwise; VIHV equals 1 if the observation was in the Insurance only group, and 0 otherwise; and the other variables are as defined earlier. The coefficients of interest are $\beta 11$ and $\beta 21$ measuring the impact of the two treatments relative to the control group.

5. RESULTS

We report the DiD estimates of the intent-to-treat effects and endline only comparisons where baseline data was not available for certain outcome variables such as referrals. The output tables in this section first list the DiD effect (coefficients $\beta 12$ and $\beta 22$ from equation 1) on the entire treatment group, followed by the impact of the treatment on the low and high sub-samples of the treatment group by income and morbidity respectively as reported in the baseline study. We note here that take-up rates for insurance are similar between the high and low income halves, as well as the high and low morbidity halves.

Health Seeking Behaviour

Table 8 presents results on visits to the CHW and to other providers for a one-month recall period. Both the treatment groups consistently have higher usage of the covered provider, the CHW, in terms of number of visits, as well as in terms of ratio of visits compared to visits to all providers (Table 8). We found a decrease in the number of times the insurance plus PP group visited an alternative formal provider during a one-month recall period, particularly in the high income and high morbidity sub-samples.

Table 9 presents outputs of the same regressions, but with treatment groups T1 and T2 combined into one, and compared with the control group as before. The findings from Table 8 are reinforced.

Referrals

The CHWs consulted the doctor during each patient visit to determine whether to handle the patient herself, or to refer to the doctor (who in turn may refer the patient to a specialist or to a hospital). Table 10 presents the outputs with the outcome variable being number of referrals during a six-month recall period. There are significantly more referrals to the clinic for both groups, and to the hospital for the Insurance plus PP group. The coefficients are consistently significant for both groups in the richer sub-sample.

Table 11 presents the above regression outputs with the combined treatment group scenario. The results are consistent in the full sample, and in the high-income and high-morbidity subsamples.

Morbidity and Outpatient Expenses

For morbidity, the insurance plus PP group and the combined treatment group have significantly fewer days of illness for a one-month recall period. In terms of outpatient expenses, we find that the high morbidity sub-sample spends about Rs.350 ($7) less on outpatient expenses for a one-month recall period, in both the individual and combined treatment groups (refer Appendix B). Moreover, both the groups - individually and combined - see a drop in the number of days of school lost by children to accompany a sick member to the clinic for a one-month recall period.

Hospitalization

The impact of the intervention on hospitalization is interesting. Tables 12 and 13 present the regression outputs for individual and combined treatment groups respectively. We found a significant drop in hospitalization expenses during a six-month recall period for the insurance only group – both overall, and within the high morbidity sub-sample, although the scheme had no inpatient cover. We found a negative

[10] The critical values for the 1%, 5%, and 10% significance levels are 2.797, 2.064, and 1.711 respectively.

impact in the combined treatment groups with 90% confidence. Table 12 shows that the insurance only treatment group had fewer days in a hospital bed overall, as well as within the poorer and high morbidity sub-samples. We also see from Table 13 that the combined treatment groups demonstrate a significant negative impact on the number of days spent on a hospital bed, in the full and high morbidity sub-samples.

Table 8: Health seeking behavior

	(1) No. of times visited VHC in past 1 mth	(2) % of VHC to total provider visits	(3) Sought a health provider in last 1 month	(4) No. times went to a formal provider in past 1 month
Insurance plus PP	0.0955***	0.0772***	-0.249*	-1.167**
	(3.80)	(3.19)	(-1.82)	(-2.77)
Insurance only	0.0764***	0.0683***	-0.275	-0.563
	(3.52)	(3.66)	(-1.43)	(-1.47)
Observations	743	743	1486	1486
Adjusted R^2	0.003	-0.003	0.059	0.022
Low income sub-sample				
Insurance plus PP	0.109**	0.0842**	-0.0148	-0.143
	(2.72)	(2.51)	(-0.08)	(-0.35)
Insurance only	0.0787**	0.0711**	-0.00958	-0.0300
	(2.57)	(2.69)	(-0.04)	(-0.07)
High income sub-sample				
Insurance plus PP	0.0798**	0.0679*	-0.476*	-2.144***
	(2.07)	(1.83)	(-1.88)	(-3.07)
Insurance only	0.0457	0.0413	-0.550	-1.097
	(1.31)	(1.44)	(-1.68)	(-1.52)
Low morbidity sub-sample				
Insurance plus PP	0.0847**	0.0713**	-0.257*	-0.985**
	(2.76)	(2.59)	(-2.00)	(-2.32)
Insurance only	0.0788**	0.0581**	-0.142	-0.277
	(2.52)	(2.40)	(-0.87)	(-0.69)
High morbidity sub-sample				
Insurance plus PP	0.114**	0.0866**	-0.300	-1.502*
	(2.68)	(2.14)	(-1.11)	(-1.88)
Insurance only	0.0911*	0.0972*	-0.529	-1.041
	(1.89)	(2.04)	(-1.57)	(-1.60)

Table 9: Health seeking behaviour - Combined treatment groups

	(1) No. of times visited VHC in past 1 mth	(2) % of VHC to total provider visits	(3) Sought a health provider in last 1 month	(4) No. times went to a formal provider in past 1 month
Treatment	0.0861***	0.0728***	-0.262*	-0.868**
	(6.54)	(5.36)	(-1.76)	(-2.56)
Observations	743	743	1486	1486
Adjusted R^2	0.003	-0.002	0.059	0.022
Treatment - low income sub-sample	0.0936***	0.0777***	-0.0121	-0.0847
	(3.73)	(3.77)	(-0.07)	(-0.22)
Treatment - high income sub-sample	0.0637**	0.0553**	-0.511*	-1.649***
	(2.55)	(2.22)	(-1.93)	(-2.96)
Treatment - low morbidity sub-sample	0.0818***	0.0648***	-0.200	-0.636*
	(3.64)	(3.51)	(-1.61)	(-2.00)
Treatment - high morbidity sub-sample	0.103***	0.0918**	-0.414	-1.272**
	(2.90)	(2.58)	(-1.50)	(-2.07)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. With household controls and village fixed effects.

Table 10: Referrals

	(1) No. times patient referred to CARE Clinic	(2) No. times patient referred to CARE Hospital
Insurance plus PP	0.258***	0.231**
	(3.03)	(2.28)
Insurance only	0.190**	0.125
	(2.74)	(1.32)
Observations	743	743
Adjusted R^2	0.084	0.039
Low income sub-sample		
Insurance plus PP	0.224	0.0690
	(1.46)	(0.51)
Insurance only	0.185*	-0.0233
	(1.72)	(-0.22)
High income sub-sample		
Insurance plus PP	0.278***	0.322**
	(3.67)	(2.51)
Insurance only	0.224**	0.244*
	(2.26)	(2.03)
Low morbidity sub-sample		
Insurance plus PP	0.195*	0.121
	(1.96)	(1.22)
Insurance only	0.239**	0.109
	(2.74)	(0.95)
High morbidity sub-sample		
Insurance plus PP	0.321***	0.376***
	(2.95)	(2.82)
Insurance only	0.148	0.177
	(1.37)	(1.58)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. With household controls and village fixed effects.

Table 11: Referrals – Combined treatment groups

	(1) No. times patient referred to CARE Clinic	(2) No. times patient referred to CARE Hospital
Treatment	0.225***	0.179**
	(3.59)	(2.19)
Observations	743	743
Adjusted R^2	0.084	0.037
Treatment - low income sub-sample	0.205*	0.0230
	(1.79)	(0.21)
Treatment - high income sub-sample	0.253***	0.285***
	(4.14)	(2.79)
Treatment - low morbidity sub-sample	0.217***	0.115
	(2.88)	(1.27)
Treatment - high morbidity sub-sample	0.235**	0.277**
	(2.62)	(2.78)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. With household controls and village fixed effects.

The coefficient in the Insurance plus PP group is not significant, and there is no effect on the hospital utilization rates of this group. Moreover, we do not see an impact on other indicators that are likely to be correlated to hospitalization expenses such as self-reported opportunity cost due to hospitalization in the past six months, or number of work days lost in accompanying a sick member in the past six months, although these account for a significant portion of the total healthcare related expenses.

We note that average hospitalization expenses (for all groups combined) have dropped by almost 50% from the baseline to the endline. This is attributed to the increasing usage of the national hospitalization subsidy scheme (Rashtriya Swasthya Bhima Yojana) that is available to Below Poverty Line[11] households in Yavatmal. There is little overlap between our intervention and RSBY, and hence this does not confound the results.

[11] As identified by the Government of India.

Table 12: Hospitalization Expenses - individual treatment groups

	(1) Was hospitalized in past 6 mths.	(2) No. of days in hospital in past 6 mths.	(3) Total hospitalization expenses in past 6 mths. (Rs.)
Insurance plus PP	-0.00810	-0.486	-303.9
	(-0.28)	(-1.40)	(-0.96)
Insurance only	-0.0291	-0.628**	-578.3**
	(-0.99)	(-2.50)	(-2.32)
Observations	1486	1484	1480
Adjusted R^2	0.014	0.018	0.012
Low income sub-sample			
Insurance plus PP	-0.0253	-0.401	-233.5
	(-0.49)	(-0.82)	(-0.73)
Insurance only	-0.0622	-0.660*	-358.6
	(-1.40)	(-1.95)	(-1.56)
High income sub-sample			
Insurance plus PP	0.00831	-0.562	-378.8
	(0.19)	(-1.04)	(-0.73)
Insurance only	0.00657	-0.589	-806.9
	(0.13)	(-1.16)	(-1.48)
Low morbidity sub-sample			
Insurance plus PP	0.0169	-0.387	-195.9
	(0.51)	(-0.89)	(-0.74)
Insurance only	0.0162	-0.156	-183.4
	(0.48)	(-0.40)	(-0.58)
High morbidity sub-sample			
Insurance plus PP	-0.0377	-0.565	-356.4
	(-0.82)	(-1.28)	(-0.63)
Insurance only	-0.0884	-1.253**	-1055.9**
	(-1.38)	(-2.66)	(-2.23)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. With household controls and village fixed effects.

Table 13: Hospitalization Expenses - combined treatment groups

	(1) Was hospitalized in past 6 mths.	(2) No. of days in hospital in past 6 mths.	(3) Total hospitalization expenses in past 6 mths. (Rs.)
Treatment	-0.0185	-0.556**	-439.7*
	(-0.93)	(-2.70)	(-1.83)
Observations	1486	1484	1480
Adjusted R^2	0.015	0.020	0.013
Treatment - low income sub-sample	-0.0444	-0.535	-298.4
	(-1.11)	(-1.42)	(-1.37)
Treatment - high income sub-sample	0.00748	-0.575	-582.2
	(0.21)	(-1.54)	(-1.27)
Treatment - low morbidity sub-sample	0.0166	-0.273	-190.0
	(0.61)	(-0.77)	(-0.74)
Treatment - high morbidity sub-sample	-0.0629	-0.907***	-704.1
	(-1.68)	(-2.92)	(-1.57)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. With household controls and village fixed effects.

There is a body of literature on the issues relating to regression adjustment when baseline covariates are unbalanced (Bruhn & McKenzie, 2011; Deaton, 2009; Freedman, 2008; Permutt, 1990). The concern with imbalance is that it could drive the end results if the imbalanced covariates are strongly correlated to outcomes, depending on the economic significance of the imbalance. However, the choice of what variables to control for is not obvious. Permutt (1990) argues that adjusting only for covariates that are significantly different in the baseline significance tests across groups could fare worse than adjusting for randomly chosen covariates. Although choosing covariates that are highly correlated to the outcome variables has higher power, Freedman (2008) and Deaton (2009) warn that under certain conditions, the point estimates could be biased if there are heterogeneous treatment effects. We ran regressions with all controls,

unbalanced covariates, and with no controls. Our results are consistent across these regressions. Appendix C shows regression outputs with no control variables with the results being stronger. The correlation between the unbalanced covariates and outcome variables is low, as is the correlation between the outcome variables in the baseline and in the endline (Table 14). This decreases the likelihood that initial differences are driving the DiD estimates, given that DiD controls for time trends, as well as for time invariant initial differences between the two groups.

Table 14: Correlations between outcome variables and covariates

	Correlation with		
Outcome variable in baseline	**Was immunized**	**Household has tap water**	**Outcome variable in endline**
Was hospitalized in past 6 mths.	0.1449	0.0422	0.0953
No. of days in hospital in past 6 mths.	0.0882	0.0129	0.2272
Total hospitalization expenses in past 6 mths. (Rs.)	0.056	0.0382	0.086
All OP health expenses in 1 mth.	0.0026	0.0181	0.0081
Sought health provider	0.1639	0.0413	0.0453
No. of episodes of illness in past 1 mth.	0.3537	0.0651	0.082
No. times sick in past 6 mths.	0.1289	-0.0457	0.1364
Self reported health ranking out of 5	0.3255	0.0463	0.5548

Finally, we had imbalance in one significant result - the outcome variable "whether the household visited a provider in the past one month". However, the imbalance in the treatment groups in the baseline was of the opposite sign of the treatment effect in the endline, diminishing the likelihood that initial differences drove the results.

As a robustness check, Appendix D reports the instrumental variable analysis results. We ran triple differences for heterogeneous treatment effects, and found that results were consistent with the results of the sub-sample double differences. However, the ANCOVA regressions did not give us consistent results (available on request).

6. DISCUSSION OF RESULTS

We found from the endline survey data that the treatment groups had a total of about 488 visits to the CHWs compared to 86 visits by the control group during a six-month recall period. Moreover, the ratio of CHWs to other providers is 7% in the treatment group compared to less than 1% in the control group for a one-month recall period. There seems to be a dramatic increase in health seeking behaviour by those having a prepaid health card, compared to those who have to pay for each visit. While treatment is cashless for the insured, the fee per visit for an uninsured patient at the CARE clinic is only Rs.12 ($0.24), which we presume is affordable since it is a small fraction of the average amount spent on outpatient care per month. This suggests that liquidity constraints are unlikely to be driving this result, but that the decision to visit seems to be highly sensitive to the price. We have no reason to suspect needless visits to the CHW by some patients simply because it is free. Only five out of 26 CHWs interviewed reported visits by card-holders when the symptoms did not justify a visit to a health provider. There is some evidence of drop in visits to non-CHW health providers in the insurance plus PP group. We conjecture that this could be due to unnecessary follow up visits being recommended by other (non-insured) providers since they receive a payment for each visit. It could also be the case that there is a preference for CHWs over these providers, or that there is a drop in the number of sick days for the Insurance plus PP group.

Overall, there were roughly three times more referrals to the doctor in town for households in the treatment groups compared to the control groups, with the referrals being proportional to the number of visits to the CHWs. The number of referrals is also much higher within the Insurance plus PP group compared to the Insurance only group, possibly due to the increased contact between the patient and the CHW.

We found reduction in outpatient expenses in the high morbidity sub-samples for both treatment groups. The Insurance plus PP group has two to three fewer sick days compared to the control group, while there is no impact in the Insurance only group. This suggests that the PP products have played a role in reducing the total sick days per household. However, it is not clear whether this is due to the preventive products used, or due to the increased contact of the households with the CHWs, thus influencing their preventive and hygiene practices. The composition of morbidity is similar across the three groups with the predominant illnesses being fever, malaria, joint pain, and eye problems.

The most interesting result to emerge from our study is that the Insurance only group had spent Rs.570 ($7.4) less on hospitalization expenses, and spent an average of 0.6 fewer days on a hospital bed (both in a six month recall period) compared to the control group, although the product did not include an inpatient cover. This may be a result of the effective referral mechanism of the programme. Our inference is that given factors like distance to a formal provider, low health awareness, low income, and poor health outcomes, people may either be postponing visits to a good healthcare provider, or may simply not have access to them, thereby not treating preventable ailments in time. The easy access of patients to the CHWs and the programme's referral system may have helped the CHWs identify potentially serious conditions early, and enabled them to recommend appropriate and timely treatment, thereby decreasing the number of days of hospitalization and hospitalization expenses. About half the hospitalization cases were for diarrhoea or dysentery, while another quarter was for gastritis, fever, typhoid, tuberculosis and anaemia, for which preventive measures are available, and early detection could potentially reduce the intensity of illness.

The impact of the treatment - and indeed the findings of our study – may have been distorted if the CHWs had incentives to treat the insured differently from the uninsured. The CHW received no commission for treating an insured patient, while she received a modest commission for treating an uninsured patient. Based on our qualitative analysis, however, we have no reason to think that the commission structure disincentivized the CHWs from treating insured patients well. Even if this were the case, our significant results still hold, as this can only understate the effect of the treatment, since the incentive of the CHW runs counter to the direction of effect of the treatment.

We have further evidence to believe that the hospitalization results were not driven by differential treatment at the CARE hospitals. Out of the 63 hospitalization cases reported in the endline, half of them sought treatment at hospitals other than CARE Hospital, and the cases were spread evenly across the groups.

We now discuss the possible concern that the drop in hospitalization is not desirable, say, perhaps because the insured patients were being referred less. In the endline survey, the percentage of treatment households that were hospitalized was 7.4%, compared to 6.6% within the control group. The number of sick days per six months was also lower among the treated (0.5 days) compared to the control group (0.6 days). Moreover, the average number of referrals to hospitals (doctors) in the treatment groups was 0.37 (0.3) per household, compared to 0.21 (0.1) in the control group, allaying the concerns that the insured patients may be under-referred to hospitals. Our interpretation is that higher number of referrals lead to comparable or more hospitalization cases, but of less intensity.

Our findings on the impact on hospitalization would be stronger if the results held true for the Insurance plus PP treatment group as well. However, the consistency of the findings with the impact on the combined treatment group suggests that this may be due to lack of power, rather than because of a negative interaction between the PP and the insurance components of the programme.

We found no impact on illness incidence rates based on a range of questions on illnesses in the one- month and six-month recall periods. While this merits further investigation since it was the primary objective of the overall intervention, it may simply be the case that a longer timeframe is needed to detect the impact of health insurance on health outcomes. For example, the percentage of those in the Insurance plus PP group that reported having "very good" or "excellent" health was a promising 52%, compared to 42% in the control group though the difference is not statistically significant. We may see more significant impact over a longer period of time.

There are at least two reasons why our results could be understated. Spillover effects are likely, since the control and treatment groups are in the same village. For example, being small villages, it could be reasonably expected that people may have shared preventive products with their friends or neighbours in the control group, and that any reduction in contagious diseases in the treatment group would make them less likely to infect members of the control group. Moreover, there was imperfect compliance in both treatment and control groups, with many in the control group purchasing the insurance and PP, potentially leading to understatement of the difference between the two groups. While we are unable to measure the extent of the spillover, we argue that it can only contribute to increase the health stock of the control group, causing our findings to be understated, rather than exaggerated. It is of course possible (and likely) that many treatment effects that would be visible with perfect compliance and no spillover were not detected by us.

Results in the Context of the Literature

We summarize in this sub-section, the existing literature on the impact of health insurance on health outcomes in developing countries and situate our paper in the context of this literature. The evaluations reviewed typically used quasi-experimental methods and are largely on government schemes that offer both outpatient and inpatient cover. We find that the overall evidence of impact of health insurance is mixed (Acharya et al., 2012).

Some studies found no impact of insurance on OOP expenditure (Bauhoff, Hotchkiss & Smith (2011) on the Targeted Scheme for the Poor in Georgia; Thornton et al. (2010) on the government-run voluntary health insurance program in Nicaragua; Wagstaff (2007) on Vietnam Health Care for the Poor), while some found a decrease (Jowett, Contoyannis & Vinh (2003) on Vietnam; Yip & Berman (2001) on Egypt's school health insurance; and Wagstaff in another study reported in 2010 on the programme in Vietnam). Some even found an increase in OOP expenditure on insured populations (e.g., Aggarwal's (2010) evaluation of the *Yeshaswini* programme in Karnataka, India). The evaluation of the universal health insurance programme in Mexico by King et al. (2009) and the evaluation of the *Arogyashri* programme in India by Fan, Karan & Mahal (2012) found a drop in hospitalization expenses.

Evidence of impact of insurance on outpatient expenses is also mixed. Bauhoff et al. (2011), and Miller, Pinto & Vera-Hernandez (2009) - which evaluated a fully-funded pro-poor Columbian scheme covering inpatient and primary care - found no impact; King et al. (2009) found a decrease; while Axelson et al. (2009) found an increase in an evaluation of the programme in Vietnam.

In terms of healthcare utilization, Aggarwal (2010) and the evaluation of a community based scheme in Burkina Faso by Gnawali et al. (2009) found an increase in outpatient usage among the insured, but found no impact on inpatient usage.

Miller et al. (2009) found higher usage of preventive care services and lower inpatient expenditure among insured populations. Other studies like Axelson et al. (2009) and the evaluation of the Basic Medical Insurance Program in China by Wagstaff & Lindelow (2008) found an overall increase in healthcare usage. Studies by Bauhoff et al. (2011), King et al. (2009), and Wagstaff (2010) found no impact on healthcare utilization.

Two studies that found positive impact on health status among insured populations are Wang, Yip, Zhang & Hsiao (2009), and Wagstaff & Pradhan (2005). Wang et al. (2009) found a significant decrease in illnesses and positive effects on heath status for all insured using EQ-5D[12] instruments while evaluating a community-based health insurance programme in China. In their evaluation of the programme in Vietnam, Wagstaff & Pradhan (2005) found improvements in Body Mass Index among the insured population.

While there is medical literature establishing the beneficial impact of timely primary care in reducing hospitalization (e.g., Dusheiko, Gravelle, Martin, Rice & Smith (1998) which uses administrative data from England), as far as we know, this is the only paper in the development economics literature that has studied the isolated impact of outpatient insurance in a field trial in a developing country, and drawn a link to its impact on hospitalization.

7. CONCLUSION

There are two policy implications that have emerged from this evaluation of the CARE programme. Firstly, provisioning of primary care through a prepaid card model may have significantly higher client impact by way of improved treatment seeking behaviour among patients compared to a pay-per-use model, even when the fee per visit is small.

Secondly, although OOP spending on outpatient care is much higher than on inpatient care, health insurers in India have been mostly focused on insuring hospitalization, which is less frequent but more catastrophic in nature. However, enrolment rates and financial viability have been a challenge, in part due to customers' sensitivity to price and disinclination to renew, especially if they did not claim. Insurers and government agencies deploying hospitalization insurance products in markets where access to healthcare is poor may benefit if the inpatient cover was bundled with outpatient insurance. Access to primary care in such markets could help reduce hospitalization, decrease claims ratios, and thereby improve the financial viability of the insurer. Lower claims ratios will help contain future premiums, which, along with the utilization of primary care services, will give clients reasons to renew the policy even if they did not file a hospitalization claim. Our finding of reduction in hospitalization expenses of Rs.1,140 ($23) per year suggests that the drop in claims in a hypothetical inpatient product bundled with primary care may offset the costs of offering the primary care component, thus potentially making it a viable proposition for insurers.

Moreover, the reasons for hospitalization in our study are illnesses like diarrhoea and fever, which are not typically associated with hospitalization in markets with better healthcare access. There may be a significant percentage of hospitalization cases whose frequency and intensity could be contained through timely primary care, thus making a case for bundling outpatient insurance with inpatient insurance to improve client value.

We hope these findings will motivate further examination of the link between primary care insurance and hospital utilization. Given the mixed evidence from past evaluations of healthcare financing schemes, isolating and evaluating individual components of such programmes may be informative.

[12] EQ-5D is a standardized simplified instrument for use as a measure of health status.

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APPENDIX A1: Product terms

1. ELIGIBILITY (AGE LIMIT)

The age limit eligibility for a member to enrol for the prepaid health card/outpatient insurance is between 6 months and 65 years. Besides age, there are no other restrictions for eligibility to the scheme.

2. PREMIUM

The Premium to be paid by the member for enrolment into the policy is as given below. Mandatory Payment - For 2 adults (main member and spouse) and 2 children (less than 18 Years) the premium is Rs.300. This is a Mandatory Payment if the client wants to buy the policy. These are the "Core Members" of the Family. Optional Payments for "Non-Core Members"

- Extra Adult Rs.60. (If the age of the adult is less than 55 Years)
- Extra Adult Rs.100. (If the age of the adult is greater than 55 Years)
- Extra Child Rs.40. (Child is less than 18 years of age)

3. FAMILY COVERAGE:

"Family" is defined as a unit living under the same roof. "Core Members" are defined as the father, mother and first two children. "Non-Core Members" are defined as child 3, child 4, grandfather and grandmother. The policy is offered to all individuals and families. If a family wants to take the insurance cover, then it is mandatory that the all the core members of the family get enrolled. It is only then the cover can be taken for non-core members by paying the extra premium for that individual, considering that the other members' age falls between 6 months and 55 years.

4. COVER LIMIT (SUM INSURED)

The cover limit offered to the clients is a maximum of Rs.2,500. There are no financial sub-limits with respect to diseases. Every time the client holding the prepaid card visits the CHW, the cost of consultation, cost of drugs and cost of diagnostics is deducted from this amount. The unutilized amount that remains after the coverage period has come to an end cannot be claimed by the member in any form. This unutilized amount will also not get transferred to the next year's policy period if the clients wished to renew the policy. The cover limit does not have sub-limits with respect to utilization of the services by any member of the insured family.

5. BENEFITS:

AT THE CHW LEVEL:

- Cost of consultation with CHW or with a back-end doctor on telephone, and the cost of drugs is covered in the policy.

AT THE CLINIC LEVEL:

- 30% discount on Specialist doctor consultations for paediatrics, ophthalmology, gynaecology and internal medicine when specialist is available at the clinic.
- 15% discount on super specialist doctors from CARE Nagpur when available at the clinic.

AT THE HOSPITAL LEVEL:

- At the hospital level in Nagpur, the insured will receive a discount of 25% on bed charges and in-house investigations.
- Cost of transportation to CARE Nagpur Hospital / Partner hospitals currently is covered by the scheme (for secondary and tertiary care) up to Rs.200/-.

DIAGNOSTIC TESTS

- If investigations like X-Ray and ultrasound are carried out at CARE partner hospitals, cardholders are eligible for 15% discount on these tests.

6. PERIOD OF COVER

The Period of cover lasts for one year. The period starts from either 1st or 15th of the month depending upon the group the person belongs to, and continues for the next 365 days.

APPENDIX A2: CHW Training

There are four training programmes for CHWs.

No.	Training Module	When it happens	Prior/during intervention	Duration (days)	Content
1	Induction training	After the CHW is selected	Prior to CHW starting work	7	Basics of common diseases, symptoms, need for hygiene, communication skills, enrolment procedures
2	Physical examination	Immediately after induction training	Prior to CHW starting work	3	How to measure height, weight, temperature, BP and other basic diagnostics. Procedure for updating records.
3	Revision training	Approximately two months after the first two training programmes	On the job	4	Revision of the lessons learnt in the first two training programmes
4	Rotation training	Once in 3 months	On the job	3	2 or 3 CHWs are selected per session and made to visit the clinic where they examine patients in the presence of a doctor who validates the procedure

APPENDIX A3: CHW Protocols

Steps when a patient visits

1. CHW enquires if it is an emergency (Accident, scorpion/snake bite, suicide). If it is an emergency, advises the patient to go to nearby hospital.

2. Check if patient is a CARE Arogya health holder.
    - Card holder: Check weight/height/BP and record the complaints stated by the patients. Trace last visit and the enrolment of the family. If the client is repeatedly availing services, check that it is justified and take opinion from Doctor on Call and the CARE Insurance department.
    - Non card holder: Check weight/height/BP and record the complaints stated by the patients. Follow the diagnostic sheet. Call doctor if necessary. If doctor refers to clinic, ask patient to go to clinic. Provide receipt with the clinic address and 'Referral' written on it. Collect money and record name, age, sex, DOB, past medical history, marital status, village name and number.

3. If non-card holder, the process stops at Step 2. If card holder, check the balance of the patient in the account. If Health Card is lost: Submit written application with a photograph to the Cluster Coordinator.

4. If the account does not have balance, inform patient that he/she will have to pay for the treatment. If he refuses, stop the process. If he agrees to pay follow the diagnostic sheet, dispense with medicine or call the doctor and give medicines as per doctor's prescription. If Doctor refers to Clinic: Ask Patient to go to Clinic. Give receipt with the Clinic Address and 'Referral' written on it.

5. Check if the disease is covered by the policy terms and conditions.
    - Ailments covered by Card: Cough, cold, fever, diarrhoea, pains, malaria, weakness, typhoid, small cuts.
    - Ailments NOT covered by Card: Diabetes, heart disease, hypertension, tuberculosis, maternal diseases, accidents, snake/scorpion bites, asthma
    - Inform Patient if the ailment is NOT covered by the Policy.
    - Ask patient to visit Clinic with the 'Referral receipt' where he can pay and avail treatment.

6. If ailments covered and medicines prescribed:
    - Hand over the Medicines to the Client.
    - Explain to the client how he/she has to take the medicines.
    - Ask them to report to you about their health after the course

7. Give receipt but DO NOT collect money

8. Ask the patient whether they are satisfied with the card services. Enter the remarks and the client details in your note book. Ask the reason as to why the client was not satisfied. Write down the complaint, reason and other details in your note book.

The CHW calls the remote doctor in most of the cases except for minor ailments such as weakness or minor injury. The doctor at CARE clinic in Yavatmal town is not available after 10 PM. However he is available over phone for emergency cases when patient is referred to a doctor in the network hospitals.

APPENDIX B: Regression with controls (Additional outcome variables)

Outpatient Expenses: Individual treatment groups

	(1) All OP health expenses in 1 mth.	(2) OP opp cost in past 1 mth. (Rs.)	(3) No. days missed work to accompany sick member in past 1 mth.	(4) No. days missed school to accompany sick member in past 1 mth.	(5) Treatment expense on top ailments in past 6 mths. (Rs.)	(6) Total expense on top ailments in past 6 mths. (Rs.)	(7) School days lost due to sick in past 6 mths.
Insurance plus PP	-328.6	-9.314	0.0666	0.0524	-127.9	-65.77	0.364
	(-1.22)	(-0.12)	(0.07)	(0.13)	(-0.95)	(-0.38)	(0.60)
Insurance only	-37.69	53.28	-0.219	-0.279	-245.4**	-260.5*	0.00452
	(-0.19)	(1.42)	(-0.61)	(-0.87)	(-2.10)	(-1.73)	(0.01)
Observations	1486	1486	1486	1485	1486	1486	1485
Adjusted R^2	-0.003	0.037	0.010	0.013	0.090	0.095	0.056
Low income sub-sample							
Insurance plus PP	-124.2	67.94	-0.00726	0.860	36.42	153.8	0.129
	(-0.93)	(0.63)	(-0.01)	(1.27)	(0.19)	(0.55)	(0.12)
Insurance only	-22.78	67.68	0.288	0.395	-141.4	-111.8	-0.248
	(-0.14)	(1.06)	(0.44)	(0.83)	(-0.86)	(-0.59)	(-0.42)
High income sub-sample							
Insurance plus PP	-521.9	-82.87	0.119	-0.719*	-284.3	-274.1	0.596
	(-1.01)	(-0.84)	(0.10)	(-1.86)	(-1.51)	(-1.19)	(1.28)
Insurance only	-47.00	41.14	-0.744	-0.976**	-352.3**	-415.5*	0.249
	(-0.13)	(0.65)	(-1.44)	(-2.56)	(-2.18)	(-1.90)	(0.77)
Low morbidity sub-sample							
Insurance plus PP	-302.2	88.78	0.129	0.252	-97.07	-119.1	-0.223
	(-0.68)	(0.84)	(0.21)	(0.70)	(-0.68)	(-0.74)	(-0.39)
Insurance only	197.4	90.95*	0.374	0.215	-74.22	-71.28	-0.347
	(0.61)	(1.83)	(0.81)	(0.66)	(-0.51)	(-0.42)	(-0.52)
High morbidity sub-sample							
Insurance plus PP	-327.3*	-143.4	0.0700	-0.158	-148.3	39.76	1.153
	(-1.83)	(-1.27)	(0.04)	(-0.19)	(-0.52)	(0.11)	(1.15)
Insurance only	-345.2**	9.045	-1.000	-0.921	-472.9**	-514.0*	0.440
	(-2.35)	(0.12)	(-1.49)	(-1.57)	(-2.41)	(-1.94)	(1.07)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Note: Top ailments are malaria, diarrhoea, and child and infant sickness

Outpatient Expenses: Combined treatment groups

	(1) All OP health expenses in 1 mth.	(2) OP opp cost in past 1 mth. (Rs.)	(3) No. days missed work to accompany sick member in past 1 mth.	(4) No. days missed school to accompany sick member in past 1 mth.	(5) Treatment expense on top ailments in past 6 mths. (Rs.)	(6) Total expense on top ailments in past 6 mths. (Rs.)	(7) School days lost due to sick in past 6 mths.
Treatment	-184.6	21.67	-0.0750	-0.111	-186.0	-162.2	0.186
	(-0.91)	(0.47)	(-0.13)	(-0.36)	(-1.66)	(-1.15)	(0.44)
Observations	1486	1486	1486	1485	1486	1486	1485
Adjusted R^2	-0.002	0.038	0.010	0.014	0.090	0.094	0.056
Treatment - low income sub-sample	-71.84	67.81	0.145	0.620	-55.34	16.70	-0.0646
	(-0.54)	(0.95)	(0.22)	(1.26)	(-0.35)	(0.09)	(-0.09)
Treatment - high income sub-sample	-297.0	-24.16	-0.290	-0.841**	-316.5**	-341.1*	0.432
	(-0.77)	(-0.39)	(-0.39)	(-2.56)	(-2.09)	(-1.74)	(1.40)
Treatment - low morbidity sub-sample	-55.84	89.85	0.250	0.234	-85.80	-95.51	-0.284
	(-0.16)	(1.34)	(0.52)	(0.73)	(-0.63)	(-0.63)	(-0.48)
Treatment - high morbidity sub-sample	-336.2**	-67.58	-0.462	-0.537	-309.8	-235.7	0.799
	(-2.56)	(-0.97)	(-0.50)	(-0.91)	(-1.47)	(-0.86)	(1.39)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. With household controls and village fixed effects.
Note: Top ailments are malaria, diarrhoea, and child and infant sickness

Morbidity: Individual treatment groups

	(1) No. of episodes of sickness in past 1 mth.	(2) No. times sick in past 6 mths.	(3) Self reported health ranking out of 5	(4) Total no. of days sick in past 1 mth.	(5) Hours worked last week
Insurance plus PP	0.224	-0.00299	1.106	-2.350**	2.151
	(0.74)	(-0.02)	(1.64)	(-2.62)	(0.40)
Insurance only	-0.0584	0.0702	-0.0600	-1.456	1.478
	(-0.15)	(0.40)	(-0.11)	(-1.67)	(0.32)
Observations	1486	1485	1486	740	741
Adjusted R^2	0.780	0.238	0.602	0.070	0.155
Low income sub-sample					
Insurance plus PP	0.681	0.105	1.328	-1.839	-1.214
	(1.48)	(0.44)	(1.68)	(-1.35)	(-0.20)
Insurance only	0.346	0.0793	0.645	-2.074	7.659
	(0.51)	(0.33)	(0.85)	(-1.29)	(1.33)
High income sub-sample					
Insurance plus PP	-0.153	-0.109	0.964	-3.498***	5.268
	(-0.33)	(-0.41)	(0.71)	(-3.77)	(0.72)
Insurance only	-0.611	0.0746	-0.982	-1.288	-7.445
	(-1.26)	(0.32)	(-0.97)	(-1.04)	(-1.35)
Low morbidity sub-sample					
Insurance plus PP	-0.334	-0.0500	0.488	-3.641***	0.0781
	(-1.26)	(-0.33)	(0.79)	(-3.04)	(0.01)
Insurance only	-0.353	0.0558	0.369	-2.615*	3.926
	(-1.02)	(0.29)	(0.53)	(-2.05)	(0.63)
High morbidity sub-sample					
Insurance plus PP	0.333	0.0814	1.319	-0.861	3.299
	(0.72)	(0.25)	(1.04)	(-0.63)	(0.34)
Insurance only	-0.284	0.106	-1.331	0.109	-0.296
	(-0.61)	(0.38)	(-1.32)	(0.07)	(-0.04)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. With household controls and village fixed effects.

Morbidity: Combined treatment groups

	(1) No. of episodes of sickness in past 1 mth.	(2) No. times sick in past 6 mths.	(3) Self reported health ranking out of 5	(4) Total no. of days sick in past 1 mth.	(5) Hours worked last week
Treatment	0.0843	0.0331	0.529	-1.911**	1.820
	(0.28)	(0.29)	(1.09)	(-2.50)	(0.41)
Observations	1486	1485	1486	740	741
Adjusted R^2	0.780	0.239	0.602	0.070	0.156
Treatment - low income sub-sample	0.508	0.0916	0.976	-1.956	3.212
	(0.95)	(0.49)	(1.53)	(-1.46)	(0.62)
Treatment - high income sub-sample	-0.370	-0.0222	0.0426	-2.451**	-0.701
	(-1.03)	(-0.12)	(0.04)	(-2.67)	(-0.12)
Treatment - low morbidity sub-sample	-0.343	0.00190	0.429	-3.141***	1.962
	(-1.32)	(0.02)	(0.76)	(-2.85)	(0.39)
Treatment - high morbidity sub-sample	0.0261	0.0935	0.000623	-0.378	1.514
	(0.07)	(0.40)	(0.00)	(-0.29)	(0.18)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. With household controls and village fixed effects.

APPENDIX C: Regressions with no household controls and village fixed effects

Health seeking behaviour

	(1) No. of times visited VHC in past 1 mth.	(2) % of VHC to total provider visits	(3) Sought a health provider in last 1 month	(4) No. times went to a formal provider in past 1 month
Insurance plus PP	0.0963***	0.0764***	-0.249*	-1.167**
	(3.78)	(3.26)	(-1.83)	(-2.78)
Insurance only	0.0776***	0.0675***	-0.275	-0.563
	(3.72)	(3.69)	(-1.43)	(-1.47)
Observations	743	743	1486	1486
Adjusted R^2	0.010	0.004	0.049	0.020
Low income sub-sample				
Insurance plus PP	0.105***	0.0811**	-0.0148	-0.143
	(2.81)	(2.60)	(-0.09)	(-0.35)
Insurance only	0.0931***	0.0846**	-0.00958	-0.0300
	(2.80)	(2.66)	(-0.04)	(-0.07)
High income sub-sample				
Insurance plus PP	0.0757*	0.0608	-0.476*	-2.144***
	(1.94)	(1.62)	(-1.89)	(-3.09)
Insurance only	0.0422	0.0338	-0.550	-1.097
	(1.27)	(1.28)	(-1.69)	(-1.53)
Low morbidity sub-sample				
Insurance plus PP	0.0862***	0.0734**	-0.257*	-0.985**
	(2.79)	(2.68)	(-2.00)	(-2.33)
Insurance only	0.0848**	0.0638**	-0.142	-0.277
	(2.34)	(2.17)	(-0.87)	(-0.69)
High morbidity sub-sample				
Insurance plus PP	0.123***	0.0889**	-0.300	-1.502*
	(2.82)	(2.18)	(-1.12)	(-1.89)
Insurance only	0.0931**	0.0943**	-0.529	-1.041
	(2.13)	(2.16)	(-1.57)	(-1.61)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Referrals

	(1) No. times patient referred to CARE Clinic	(2) No. times patient referred to CARE Hospital
Insurance plus PP	0.258***	0.229**
	(3.16)	(2.33)
Insurance only	0.185***	0.126
	(2.99)	(1.45)
Observations	743	743
Adjusted R^2	0.087	0.044
Low income sub-sample		
Insurance plus PP	0.227	0.0629
	(1.53)	(0.49)
Insurance only	0.188**	-0.00863
	(2.10)	(-0.09)
High income sub-sample		
Insurance plus PP	0.270***	0.314**
	(3.59)	(2.51)
Insurance only	0.211**	0.230*
	(2.10)	(2.06)
Low morbidity sub-sample		
Insurance plus PP	0.217**	0.130
	(2.23)	(1.28)
Insurance only	0.236***	0.113
	(3.09)	(1.09)
High morbidity sub-sample		

Insurance plus PP	0.301**	0.379***
	(2.79)	(2.95)
Insurance only	0.135	0.166
	(1.23)	(1.58)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Hospitalization Expenses

	(1) Was hospitalized in past 6 mths.	(2) No. of days in hospital in past 6 mths.	(3) Total hospitalization expenses in past 6 mths. (Rs.)
Insurance plus PP	-0.00810	-0.489	-306.3
	(-0.28)	(-1.41)	(-0.97)
Insurance only	-0.0291	-0.630**	-577.7**
	(-0.99)	(-2.51)	(-2.32)
Observations	1486	1484	1480
Adjusted R^2	0.006	0.007	0.009
Low income sub-sample			
Insurance plus PP	-0.0253	-0.406	-233.5
	(-0.49)	(-0.82)	(-0.73)
Insurance only	-0.0622	-0.665*	-357.7
	(-1.41)	(-1.94)	(-1.56)
High income sub-sample			
Insurance plus PP	0.00831	-0.562	-384.4
	(0.19)	(-1.04)	(-0.74)
Insurance only	0.00657	-0.587	-804.3
	(0.13)	(-1.16)	(-1.49)
Low morbidity sub-sample			
Insurance plus PP	0.0169	-0.390	-197.4
	(0.51)	(-0.89)	(-0.75)
Insurance only	0.0162	-0.160	-183.4
	(0.49)	(-0.41)	(-0.58)
High morbidity sub-sample			
Insurance plus PP	-0.0377	-0.565	-361.0
	(-0.82)	(-1.28)	(-0.64)
Insurance only	-0.0884	-1.253**	-1056.1**
	(-1.39)	(-2.68)	(-2.24)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Out-patient Expenses

	(1) All OP health expenses in 1 mth.	(2) OP opp. cost in past 1 mth. (Rs.)	(3) No. days missed work to accompany sick member in past 1 mth.	(4) No. days missed school to accompany sick member in past 1 mth.	(5) Treatment expense on top ailments in past 6 mths. (Rs.)	(6) Total expense on top ailments in past 6 mths. (Rs.)	(7) School days lost due to sick in past 6 mths.
Insurance plus PP	-328.6	-9.314	0.0666	-5.943	-127.9	-65.77	0.364
	(-1.22)	(-0.12)	(0.07)	(-0.98)	(-0.95)	(-0.38)	(0.61)
Insurance only	-37.69	53.28	-0.219	-6.274	-245.4**	-260.5*	0.00452
	(-0.19)	(1.42)	(-0.61)	(-1.04)	(-2.11)	(-1.73)	(0.01)
Observations	1486	1486	1486	1486	1486	1486	1485
Adjusted R^2	-0.000	0.032	0.010	0.000	0.070	0.077	0.053
Low income sub-sample							
Insurance plus PP	-124.2	67.94	-0.00726	-11.23	36.42	153.8	0.129
	(-0.93)	(0.63)	(-0.01)	(-0.91)	(0.19)	(0.56)	(0.12)
Insurance only	-22.78	67.68	0.288	-11.69	-141.4	-111.8	-0.247
	(-0.14)	(1.07)	(0.45)	(-0.94)	(-0.86)	(-0.60)	(-0.42)
High income sub-sample							
Insurance plus PP	-521.9	-82.87	0.119	-0.719*	-284.3	-274.1	0.596
	(-1.02)	(-0.85)	(0.10)	(-1.86)	(-1.52)	(-1.20)	(1.28)
Insurance only	-47.00	41.14	-0.744	-0.976**	-352.3**	-415.5*	0.249
	(-0.13)	(0.65)	(-1.45)	(-2.57)	(-2.19)	(-1.90)	(0.77)
Low morbidity sub-sample							

Insurance plus PP	-302.2	88.78	0.129	-10.69	-97.07	-119.1	-0.223
	(-0.68)	(0.84)	(0.21)	(-0.96)	(-0.68)	(-0.74)	(-0.40)
Insurance only	197.4	90.95*	0.374	-10.73	-74.22	-71.28	-0.348
	(0.61)	(1.84)	(0.81)	(-0.96)	(-0.51)	(-0.43)	(-0.53)
High morbidity sub-sample							
Insurance plus PP	-327.3*	-143.4	0.0700	-0.158	-148.3	39.76	1.153
	(-1.83)	(-1.28)	(0.04)	(-0.20)	(-0.52)	(0.11)	(1.15)
Insurance only	-345.2**	9.045	-1.000	-0.921	-472.9**	-514.0*	0.440
	(-2.37)	(0.12)	(-1.50)	(-1.58)	(-2.42)	(-1.95)	(1.07)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Morbidity

	(1) No. of episodes of sickness in past 1 mth.	(2) No. times sick in past 6 mths.	(3) Self reported health ranking out of 5	(4) Total no. of days sick in past 1 mth.	(5) Hours worked last week
Insurance plus PP	0.224	-0.00299	1.106	-2.304**	-0.167
	(0.74)	(-0.02)	(1.64)	(-2.69)	(-0.03)
Insurance only	-0.0584	0.0702	-0.0600	-1.521	-1.525
	(-0.15)	(0.40)	(-0.11)	(-1.66)	(-0.36)
Observations	1486	1485	1486	740	741
Adjusted R^2	0.779	0.231	0.581	0.072	0.106
Low income sub-sample					
Insurance plus PP	0.681	0.105	1.328	-1.781	-4.614
	(1.48)	(0.44)	(1.69)	(-1.31)	(-0.68)
Insurance only	0.346	0.0783	0.645	-2.138	3.036
	(0.51)	(0.33)	(0.85)	(-1.35)	(0.50)
High income sub-sample					
Insurance plus PP	-0.153	-0.109	0.964	-3.439***	4.821
	(-0.33)	(-0.41)	(0.72)	(-3.63)	(0.65)
Insurance only	-0.611	0.0746	-0.982	-1.424	-8.778
	(-1.27)	(0.32)	(-0.97)	(-1.06)	(-1.60)
Low morbidity sub-sample					
Insurance plus PP	-0.334	-0.0500	0.488	-3.386***	0.718
	(-1.26)	(-0.33)	(0.79)	(-2.85)	(0.13)
Insurance only	-0.353	0.0565	0.369	-2.795**	2.143
	(-1.02)	(0.30)	(0.53)	(-2.23)	(0.36)
High morbidity sub-sample					
Insurance plus PP	0.333	0.0814	1.319	-0.993	-1.493
	(0.73)	(0.25)	(1.04)	(-0.71)	(-0.15)
Insurance only	-0.284	0.106	-1.331	0.0370	-5.049
	(-0.61)	(0.38)	(-1.32)	(0.02)	(-0.61)

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

APPENDIX D – Instrumental Variable Estimates

Health Seeking Behaviour

	(1) No. of times visited VHC in past 1 mth.	(2) % of VHC to total provider visits	(3) Sought a health provider in last 1 month	(4) No. times went to a formal provider in past 1 month when sick
InsuranceplusPP - IV	0.351***	0.282***	-0.913**	-3.930***
	(5.72)	(4.63)	(-2.10)	(-3.24)
Insuranceonly - IV	0.245**	0.223**	-0.959	-1.080
	(2.06)	(2.18)	(-1.29)	(-0.66)
Observations	743	743	1486	1486
Adjusted R^2	-0.055	-0.063	-0.117	-0.085

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Referrals

	(1) No. times patient referred to CARE Clinic	(2) No. times patient referred to CARE Hospital
InsuranceplusPP - IV	0.927***	0.797**
	(3.46)	(2.43)
Insuranceonly - IV	0.544**	0.303
	(2.12)	(0.86)
Observations	743	743
Adjusted R^2	-0.019	-0.026

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Morbidity

	(1) No. of episodes of sickness in past 1 mth.	(2) No. times sick in past 6 mths.	(3) Self reported health ranking out of 5	(4) Total no. of days sick in past 1 mth.	(5) Hours worked last week
InsuranceplusPPXPost – IV	0.675	0.0225	3.443	-8.176***	-1.568
	(0.64)	(0.04)	(1.56)	(-2.76)	(-0.08)
InsuranceonlyXPost – IV	-0.575	0.319	-1.765	-4.269	-7.118
	(-0.35)	(0.38)	(-0.66)	(-1.15)	(-0.43)
Observations	1486	1485	1486	740	741
Adjusted R^2	0.741	0.114	-0.044	-0.142	-0.049

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Outpatient Expenses

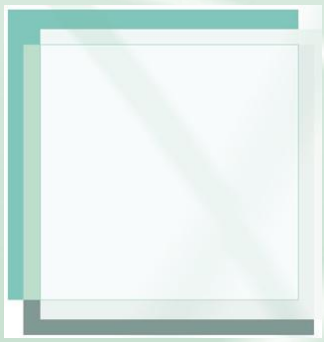
	(1) All OP health expenses in 1 mth.	(2) OP opp cost in past 1 mth. (Rs.)	(3) No. days missed work to accompany sick member in past 1 mth.	(4) No. days missed school to accompany sick member in past 1 mth.	(5) Treatment expense on top ailments in past 6 mths. (Rs.)	(6) Total expense on top ailments in past 6 mths. (Rs.)	(7) School days lost due to sick in past 6 mths.
InsuranceplusPPXPost - IV	-1049.1	-3.921	0.105	0.0263	-518.0	-330.2	1.144
	(-1.18)	(-0.02)	(0.04)	(0.02)	(-1.28)	(-0.62)	(0.59)
InsuranceonlyXPost - IV	263.6	262.6	-1.119	-1.383	-980.4**	-1134.8*	-0.475
	(0.34)	(1.44)	(-0.75)	(-1.18)	(-2.12)	(-1.85)	(-0.39)
Observations	1486	1486	1486	1485	1486	1486	1485
Adjusted R^2	-0.050	-0.050	-0.015	-0.042	-0.026	-0.011	-0.022

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Hospitalization Expenses

	(1) Was hospitalized in past 6 mths.	(2) No. of days in hospital in past 6 mths.	(3) Total hospitalization expenses in past 6 mths. (Rs.)
InsuranceplusPPXPost - IV	-0.0392	-1.839*	-1245.7
	(-0.44)	(-1.71)	(-1.28)
InsuranceonlyXPost - IV	-0.126	-2.306*	-2292.6**
	(-0.92)	(-1.84)	(-2.15)
Observations	1486	1484	1480
Adjusted R^2	-0.044	-0.070	-0.068

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$



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