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Impact Evaluation of India's 'Yeshasvini' Community Based Health Insurance Programme

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Impact Evaluation of India's 'Yeshasvini' Community Based Health Insurance Programme

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Abstract

Using propensity score matching techniques, the study evaluates the impact of India's Yeshasvini community based health insurance programme on utilisation of health care, the intensity of use, financial protection, treatment outcomes and economic well being. The programme offers free OPD and lab tests at discounted rates when ill but, more importantly, it covers highly catastrophic and less discretionary impatient surgical procedures. It is therefore expected to have both price reduction and income transfer effects on health care use. For evaluation, a total number of randomly selected 4109 households in villages in rural Karnataka, an Indian State, were interviewed using a structured questionnaire. A comprehensive set of indicators was developed and by means of particular tests and other procedures, the quality of results was tested. Generally, the programme is found to have increased the use and intensity of health care utilization, reduced out-of-pocket spending, ensured better health and economic outcomes. However, the effects are more pronounced on those health services that are directly covered under the programme. Effects remain small for other services. Thus the effects of insurance operate through a reduction in the price of health care; income transfer/ secondary effects remain insignificant. Furthermore, the impact varies across socio economic groups. The paper demonstrates that community insurance presents a workable model for providing high end services in resource-poor settings through an emphasis on accountability and local management.

Key words: Community based health insurance, impact evaluation, India, Karnataka, state,

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Impact Evaluation of India's 'Yeshasvini' Community Based Health Insurance Programme

1. Introduction

Most national governments in developing countries have, in recent years, been trying to promote community based health insurance programmes (CBHI) as part of their health policy. While the concept of CBHI holds theoretical appeal, empirical evidence as to its effectiveness remains scarce. Most existing studies have focused on the impact of community financing programmes on health care utilization and financial protection (Preker et al. 2001, Jakab and Krishnan 2001, 2004, Ekman 2004, Wagstaff et al. 2007 for survey). An important question whether or not these programmes have improved the health outcomes and economic well being of the poor, which are the ultimate objectives of the health policy, has received rather scant attention.The present study addresses this gap in the literature. It evaluates the impact of one of the most innovative and successful non government community based health insurance (CBHI) programmes in India not merely in term of the traditional health care utilisation and financial protection outcome indicators but more importantly in terms of its effectiveness in promoting better health outcomes and economic well being of the enrolees. The programme, 'Yeshasvini health insurance' for cooperative rural farmers and informal sector workers is a voluntary, not-for-profit prepayment insurance programme that covers highly catastrophic and less discretionary inpatient surgical procedures at a low contribution. The programme, which began in 2003 in 'Karnataka' a state in the Southern part of India, has a total of 3.0 million members. Using propensity score matching methods, a technique that is increasingly being used in the literature on health impact assessment we evaluate its health and economic impacts. If our findings can demonstrate that there is a link between the programme enrolment and improved health and economic outcomes, it would have an important policy implication for health financing for the poor in the country, in particular, in the area of high end medical care. The analysis is based on a household survey of 4109 households conducted for the study across 82 villages in 'Karnataka', where the programme is in operation.

The rest of the study is organized into 7 sections. Section 2 provides a brief description of the Yeshasvini programme and formulates hypotheses. Section 3 describes the methodology while section 4 focuses on the database used for evaluating the performance of the

programme. Sections 5 and 6 present estimation results. Section 7 discusses the cost of the programme. Finally, Section 8 concludes the analysis and draws policy implications.

2. The Yeshasvini Health Insurance Programme and health and economic outcomes: Major Hypotheses

Introduced in June 2003 for cooperative rural farmers and informal sector workers, the programme is a unique example of tri-sector partnership. It is a tri-sector collaborative venture between the public, private and cooperative sectors, and benefits from the expertise of each partner that best meets public needs of health insurance through the appropriate allocation of responsibilities (See, Kuruvilla and Liu 2007, ILO 2006, Radermacher et al 2005, IDPAD 2005, for discussion). The programme operates in the cooperative sector to take advantage of the societal capital generated by a vast network of cooperative societies in Karnataka[1] which connects diverse rural farmers and rural informal sector workers. The State Co-operative Department mobilises membership with the help of the cooperative society network, collects revenue and oversees operations of the programme while private sector hospitals networked with the programme provide medical services. Some of the government run and charitable hospitals are also part of the network. Though the programme operates under the aegis of the State Department, it is governed by an independent Trust which is assisted by a third party administrator as an executive organ. The Trust comprises of representatives of the relevant government departments and network hospitals. The third party administrator (Family Health Plan Limited) and representatives of the cooperative sector may also attend the meetings of the Trust.

The premium is fixed at the flat rate of Rs. 120 (US$2.4)[2] per person per year. The management reviews the rate from time to time and revises it if the need is felt (Table 1). The programme operates at the state wide level and therefore provides for a large risk pool and economies of scale in its organization and management. In the first year of the programme itself 1.6 million cooperative members enrolled with the programme. In the current year, enrolment has increased to 3.0 million which marks 29.3 percent increase over the increased base of the last year. Though the programme is voluntary, the administrative machinery of

[1] There are over 32,000 cooperative societies in the state.
[2] Assuming the exchange rate of $1=Rs. 50.

the State Cooperative Department exerts considerable efforts to achieve high levels of participation.

Table 1: Financial Performance indicators of the programme

	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Enrolment (mn)	1.6	2.02	1.47	1.85	2.32	3.0
Premium (Rs)	60	60	120*	120	120	120
Contribution collected(Rs. mn)	96.91	119.76	163.44	215.45	276.3	361.0
Government Contribution (Rs.mn)	45	35.8	110	208.5	200	150.0*
Other Sources (Rs.mn)	3.88	11.34	5.45	5.06	20.15	-
Total Amt Collected (Rs.mn)	145.79	166.89	278.9	429.02	496.46	-
Surgeries (no.)	9,047	15,236	19,677	39,602	60,668	-
surgery to enrolment ratio	0.57	0.75	1.35	2.13	2.60	-
Utilisation_Subscription ratio (%)	30.1	114.8	160.1	178.8	195.7	-
Amt of sanction per surgery (Rs.)	11786.49	12124.09	13299.49	9784.908	8915.7	-
Av. Payoff to premium ratio	0.990	0.990	0.991	0.988	0.987	-
Free OPD (Number)	35,814	50,171	52,892	206,977	155,572	-

- Rs. 60 for the under 18 age group population.
- Source: The Yeshasvini Trust

On the benefit side, the programme covers only surgical procedures[3], i.e. high cost low probability highly catastrophic medical event. The programme does not cover non surgical in-patient admissions. The maximum coverage per person per year amounts to Rs. 200,000 (US $4000) with free OPD. Considering the fact that the average per capita income of the state is around Rs.15,500 (2007-08 figure) the package is considerably generous. The service is cashless to the policy holder; the insurer makes direct payment to the health care provider for pre-approved surgeries. The programme offers the poor the opportunity of taking benefits of advanced and highly expensive surgical treatments which otherwise would be non accessible to them. However, at the current level of premium, financial sustainability of the programme is not achievable partly because it covers high end medical treatment but, more importantly, because the programme is voluntary where the problem of adverse selection cannot be ruled out. Table 1 shows that the utilisation to collection ratio has continuously been increasing. It increased from 30 percent in 2003-04 to over 195 percent in 2007-08. To ensure financial sustainability of the programme, the government provides subsidy (Table 1).

[3] The benefits are reviewed from time to time and appropriate changes are introduced in the package depending on the demand. For instance, recently, normal deliveries and emergencies such as snake bite, bull gore and dog bites are also included in the packge, keeping in view the growing demand for such coverage. Medico-legal cases (such as assaults, rapes, and accidents) are however not covered under the programme

The Trust also welcomes donations from private and government bodies. As of July 2008, the total fund of the Trust was Rs. 500 million.

There has been a rapid increase in the number of surgery cases over time. In 2003-04, a total number of 9047 surgeries took place, the number increased to 60,668 in 2007-08. Since surgical interventions involve huge expenses, their financial consequences for the poor are severe in the short and the long-term. The scheme is therefore expected to provide significant financial protection to the poor enrollee farmers against the health risks. Furthermore, given that premiums are small and flat but payoffs are large, the programme is expected to generate substantial price reduction and income transfer effects resulting in increase in the use not only of surgical processes but also of primary health care services. According to Nyman (2000), the difference between the payoff and the premium is a transfer of income from those who remain healthy to the person who becomes ill. The income transfer effect of the price-payoff insurance would reinforce the effect of price reduction and would increase medical care consumption of services more than that would be justified by the price reduction effect alone. Insurance induced health care utilization is therefore positively related to the gap between the premium and payoff. This effect is likely to be substantially large in the case of Yeshasvini because premiums are small and flat but payoffs are large.

Network hospitals are also encouraged to offer Yeshasvini members free OPD consulations and lab tests at discounted rates[4]. These benefits may be small but may further promote utilization of primary health care services.

Increased access to health care services and financial protection should translate into better treatment outcomes, better health status and improved economic well being (Grossman 1972). Concerns have however been expressed that because the programme provides insurance cover for the high end services it may result in an increased utilization of expensive care/over utilization of health care with little impact on health or economic well being. A closer look at the programme indicates that such concerns may be an exaggeration. The price schedule for service providers is significantly below the normal market charges, and it has not been adjusted for price inflation since the inception of the programme. The objective is to discourage service providers from prescribing surgery where it is not required. Furthermore,

[4] The discount rate varies across network hospitals.

tight monitoring and the possibility of punitive actions also discourage over-prescription of health care services. For instance, many related services are not covered or covered partially; hospitals cannot claim money for any additional medical process required at the time of surgery for which pre authorisation is not taken; and any hospital found to have indulged in frauds, and cheating the patients, is dropped out of the programme forever. Furthermore, there are well defined penalties for other offences and defaults. Finally, reimbursement rules are being made increasingly stringent. But tight monitoring and limited budget may in fact result in poorer health services and hence poor treatment outcomes. Even while over-prescription of treatment might be argued to be a distant possibility, adverse selection remains imminent. Any evidence of increased health care utilisation could be strongly suggestive of adverse selection. The final economic and health outcomes are therefore subject to rigorous empirical testing.

3. Methodology

Propensity score matching methods are used for the impact evaluation of the programme. The basic idea is to find in a group of non-participants those individuals who are similar to the participants in all relevant observable characteristics X. That being done, differences in outcomes of the control (untreated) group and of participants (treated) can be attributed to the programme. This essentially means that the outcomes of members are compared with the potential outcomes of untreated households had they been members of the programme. More specifically, if P=1 for treated group and =0 for untreated group, then the average treatment effect on treated (ATT) on an outcome variable Y is

$$ATT= E(Y_1-Y_0|P=1),$$

which means,

$$ATT= E(Y_1|P=1)-E(Y_0|P=1)$$

While data on $E(Y_1|P=1)$ are available from the programme participants, estimation of the counterfactual $E(Y_0|P=1)$ is based on the assumption that after adjusting for observable differences, the mean of the potential outcome is the same for P = 1 and P = 0. Propensity scores are used for conditioning for observable differences. Propensity score is the probability of participating in a programme given observed characteristics *X,* and matching procedures based on this score are termed propensity score matching methods (Caliendo and

Kopeinig 2008). While implementing the technique we had to address several questions at each step of the procedure and make several choices. In what follows, we briefly describe them.

Estimating the propensity score

The first step in implementing the technique was to estimate propensity scores using probit/logit models. The propensity score function, as it is called, is a statistical tool that enables us to construct a propensity score. Three choices had to be made: treated (members of the programme) and untreated (non members) groups, the model to be used for the estimation, and the variables to be included in the specification.

Treated vs. untreated groups: Estimation of the propensity score function required two sets of households: participants of the programme (treated) and non participants (untreated). Our dataset however had a complicated structure comprising of multiple subsets of households, both within participants and non participants. Within the group of Yeshasvini households (YH), several sub samples could be identified depending on the duration of their membership and their status as beneficiaries, which would be of interest to us. Since we have included in our impact evaluation, a wide range of outcome variables representing health care use, financial protection, treatment outcome, and economic well being covering medical events ranging from OPD to surgery and maternal health, we had to identify more than one category of treated group to accommodate all of them in a single study. For instance, while OPD related use and outcomes could be evaluated with current members as the treated group maternal health and surgery related health care use, and economic status indicators could be meaningfully examined by focussing on that group of members which has been with the scheme for the past few years now. Furthermore, the impact of the programme on surgery related outcomes could be evaluated by focusing on the actual beneficiaries as the treated group. We have therefore identified three broad categories of the treated group : one, households who had the member status at the time of survey; two, households who had been renewing their membership for the past three years or more; and three, households who had availed the benefit of membership at least once during the past 4 years.

Non participants also comprised of two broad groups of households: non yeshasvini cooperative households (NYCH); and non yeshasvini non cooperative households (NYNCH).

The issue was which of the two groups should be used as 'untreated'. The argument in favour of NYCH was that the matching of YH with NYCH might be more successful since both were cooperative households and were therefore likely to be more comparable than non cooperative population group. But this did not necessarily mean that NYCH was a more appropriate untreated group. It could be that the decision of NYCH households not to select themselves into the programme was largely influenced by unobservables that were not fixed over time. Some participants, for instance, might be in the programme precisely because they were high risk households that might not have been observed by us. Some non-participants on the other hand might deliberately not have joined the programme because they recently received treatment and felt that they did not need such treatment in near future (Wagstaff et al 2008a, for discussion). Unlike YH and NYCH groups, the difference between YH and NYNCH groups was more likely to be captured by observable factors. However, the participation in cooperative societies is itself is voluntary, and the possibility of unobservable self selection bias could not be ruled out even in this case. Since the relative magnitudes of bias could not be ascertained in the two groups, we considered both NYCH and NYNCH as untreated groups in alternative specifications. This could also help us in examining the sensitivity of the results to the choice of untreated group. We thus had three treated and two untreated groups. Propensity score methods require that a separate propensity score specification be estimated for each treatment group-comparison group combination (Dehejia 2005). We therefore specified three propensity score models (with three treated groups) for each untreated group, which meant six in all.

Model choice**:** Little guidance is available in the literature regarding which functional form to use, Probit or logit (Smith 1997). In principle, any discrete choice model could be used. But, in general, this choice is influenced by the quality of matching achieved. Following this broad principle we used probit models in the analysis.

Choice of variables: Literature is replete with the analyses of factors affecting the demand for health insurance. Most studies focus on individual/household specific factors such as income, nature of their economic activity, demographic patterns, age structure, health patterns, social status, education, and personal preferences. However socio economic contexts within which households live cannot be ignored. We therefore explicitly take into account village specific, and district specific attributes along with household specific characteristics. They include economic conditions, literacy, health infrastructure, distance from the nearest health facility,

and distance from the nearest yeshasvini facility, living conditions, poverty, transport facilities and the coverage of cooperative societies. We compiled information on more than 400 variables at the village and the district level, each. The 'statistical significance approach' combined with the 'hit or miss' method was adopted in the final selection of models. We started with a basic model of demand for health insurance and then added new variables to test their performance. Variables were kept if they were statistically significant and increased the prediction rates notably.

The Balancing test

Since conditioning is not done on all covariates but only on the propensity score, it is required that the matching procedure is able to balance the distribution of the relevant variables in both the control and treatment groups. We were to decide whether the test be performed only on the observations that had propensity scores within the common support region i.e. precisely on the subset of the untreated (or control) group that was most comparable to the treatment group or on the full set of control group. It is believed that imposing the common support restriction in the estimation of propensity scores improves the quality of the estimates. But there are also arguments against imposing this restriction. Lechner (2001) for instance, argues that besides reducing the sample considerably, imposing the restriction may lose high quality matches at the boundary of the common support region. However, following the standard practice to limit comparisons to a subset of cases lying on the common support of propensity scores, we also dropped households off the common support. We thus restricted our balancing test in the common support region.

Assessing the quality of matching

For assessing the quality of matching, the situation before and after matching needs to be compared to check if there remain any differences after conditioning on the propensity score. Various indicators of assessing the quality of matching are available in the literature (Caliendo and Copeinig 2008). We used the mean absolute standardized bias (Rosenbaum and Rubin 1985) and pseudo R^2 (Sianesi 2004) tests, which could be applied using pstest (in psmatch2) command of STATA.

Choosing algorithm for matching

Various propensity score matching methods have been proposed in the literature as a means to identify a comparison group. Each of these methods implies a trade off between quality and quantity of the matches (Caliendo and Kopeinig 2008, for discussion). We make use of the Kernel method which uses *all* households units in the control group to construct counterfactual outcome for treated households. This is a type of weighted regression of the outcome on the treatment indicator variable, the kernel weights being a decreasing function of the absolute difference in propensity score between the treated and untreated unit (Smith and Todd 2005). A Gaussian kernel with bandwidth of .06 is used for the analysis. Following the practice in applications of PSM to limit comparisons to a subset of cases lying on the common support of propensity scores, we have also dropped households off the common support.

Outcome *Variables*

Outcome variables were classified into 4 broad groups: (1) health care utilisation; (2) financial protection; (3) treatment outcome (days lost, income lost, perception regarding the level of satisfaction, abnormal deliveries and caesarean deliveries); (4) economic well being (Change in income, savings, borrowings, sale/purchase of assets, and total savings and borrowings over the past three years).

Two things are important to note. One, health care utilization variables such as waiting period, consultations, OPD visits, incidence of hospitalisation are commonly used in the literature on health economics. Following this literature, we have developed measurable indicators of health utilization across five different categories of medical episodes: (1) out_patient treatment, (2) chronic disease, (3) in_patient treatment, (4) surgery, and (5) pregnancy. Indicators of financial protection and treatment outcomes also cover these categories, wherever possible. A comprehensive coverage of these variables in the context of different medical episodes in a single study is scarce in the literature. Two, in the literature, the measures of 'financial protection' are based on people's out-of-pocket spending (OOPs) on medical care (See Wagstaff 2008b for survey of literature). According to Wagstaff (2008b), 'the assumption underpinning these approaches is that the household's nonmedical expenditure in the period under consideration would have increased by an amount equal to its

out-of-pocket expenditures on medical care had it not been forced to incur the out-of-pocket spending' (p 17). Three observations may be made. First, the penetration of health insurance in the rural population is extremely low, especially for catastrophic expenditures. Out of pocket is the norm of payment in most cases. Second, medical outlays itself is a normal product (Grossman 1972) yielding higher utility than other consumption products during illness. Third, the assumption that consumption drops *pari passu* with medical outlays is rather naïve. Any shortfall in resources due to such emergency expenditures is made up by borrowing or sale of assets and it is indebtedness/ sale of assets which has large impoverishing effects on the poor in the rural areas. We have therefore categorized total payment into 'borrowing/sale of assets based payment' and 'out of pocket/savings based payment' and used them as indicators of financial protection.

Estimation of standard errors

The estimated variance of the treatment effect includes the variance due to the estimation of the propensity score, the imputation of the common support, and possibly also the order in which treated individuals are matched. These estimation steps add variation beyond the normal sampling variation (see the discussion in Heckman, Ichimura, and Todd 1998). The most commonly used method to deal with this problem is to use bootstrapping as suggested by Lechner (2002). Following the technique, we modified the estimates of standard deviations by bootstrapping 50 replications to reduce bias. In general, 50 replications are observed to be good enough to give a good estimate of standard error (Efron and Tibshirani 1993).

Limitations of the methodology

Matching removes any bias caused by selection on observable variables, but leaves the possibility of bias due to selection on *unobservable* variables. Thus the perfect matching is not possible. Any bias due to selection on *time invariant* unobservables could however be removed by combining the matching technique with difference-in-difference method to look at changes between `members' and 'non member' households before and after the programme's implementation (Heckman et al. 1997). But there were no suitable baseline data that could allow us to use this method. We have therefore used matching between members and non members in the post implementation phase.

4. Database

The database contains three levels of hierarchy: district level, village level and the household level, and is based on secondary and primary sources.

Household data: We carried out a household (HH) survey covering 4109 households: insured and uninsured, in 82 villages across 16 districts of the state. A cross-sectional research design and a multi-stage sampling method were used in the selection of insured and uninsured households. The State is divided into 5 zones by the Agricultural Department: North, East, West, Central and South. Each zone is further divided into sub-zones taking into consideration the rainfall pattern-quantum and distribution, soil types, depth and physio-chemical properties, elevation, topography major crops, and the type of vegetation. We selected 42 blocks representing the 5 regions and 10 sub zones. Our sample blocks covered 67.4 percent of the total population and 67 percent households in the State. For the village selection, Census 2001 villages constituted the sampling frame. Two to three strata of villages were formed in each block on the basis of the number and distribution of households. One village was selected from each stratum randomly. From each stratum, one village was selected. The sample villages therefore represent very small villages with less than 1000 persons to large villages with population over 5000 persons. The final sampling stage consisted of selecting a random sample of households per village. The number of households selected in each village was in proportion to the village population. Lists of yeshasvini members were acquired from cooperative societies in each village. For a sample of non yeshasvini members, we divided each village in appropriate number of parts on the basis of the number of households and from each part, selected pre-fixed number of households randomly, after excluding the yeshasvini members. It was ensured that non cooperative members were also sampled from each block in accordance with the population. A total of 4109 households were surveyed; they covered 21630 persons with an average household size of 5.26 which is slight below 5.3 provided in the Census 2001.

A fully structured questionnaire was used to collect information on economic, social, behavioural and health status of each sampled household. In almost 80 percent of the cases responses were made directly by the head of the family or his/her spouse. Responses in the remaining cases were made by adult children of the head of the family (15 percent of the

cases); and by other members of the households including parents, brother/sisters of the head of the family (5 percent).

The sample comprised of three groups of population: Cooperative members who were yeshasvini members (1555 HH constituting 37.84% sample); Cooperative members who were not yeshasvini members (1402) and Non cooperatives . A household that had at least one yeshasvini member at the time of survey was classified as 'yeshasvini household'.

Village data: The village level information was based on both primary and secondary sources. The primary data was collected from all the 82 villages covered in the sample. A questionnaire was designed for obtaining village level information. The questionnaire sought information on socio, economic and health conditions. It also acquired information on the functioning of cooperative societies in the village. The primary information was supplemented by the secondary information sourced from the 'Department of Rural Development and Panchayat Raj'. The Department provides information on 387 parameters pertaining to 21 broad categories including location, demography, health, water supply and sanitation conditions, educational infrastructure, agriculture, housing, transport, roads and welfare programmes.

District level data: The district level information pertaining to more than four hundred variables covering economic, social, health, and cooperatives' status was collected using a wide rage of sources. Several departments of the government of Karnataka were approached for the information.

5. Propensity score functions and the quality of matching

We estimated six propensity score functions for six different combinations of treated and untreated groups. While estimating these functions, the test of the balancing property was performed only on the observations whose propensity score belonged to the intersection of the supports of the propensity score of treated and controls. Table 2 reports the descriptive statistics of variables (see, Appendix Table A1 for description) that were included in the propensity score functions. It may be observed that, in general, yeshasvini households (YH) are fairly similar to non yeshasvini cooperative households (NYCH) but they tend to be quite different from non yeshasvini non cooperative households (NYNCH).

Table 2: Mean and T-statistics of observable characteristics of sample households by membership

	YH		NYCH		NYNCH	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
H_Dumchronic	0.320	0.577	0.236	0.501	0.210	0.473
H_Headeduyears	5.988	4.982	4.446	4.641	3.883	4.579
H_Headedustatus	2.148	1.209	1.813	1.049	1.712	1.051
H_Aveduyears	6.573	3.215	5.222	3.345	4.383	3.126
H_Headage	51.409	12.311	50.413	12.860	47.431	13.019
H_Hsize	5.534	2.672	5.288	2.340	4.778	2.146
H_asset	0.260	0.776	-0.026	0.726	-0.330	0.670
H_Demodivage	70.601	21.986	68.919	22.661	68.062	22.888
H_Perincome	12976.950	9800.021	12064.370	12756.570	10403.740	11434.350
H_sc_grp	0.117	0.321	0.218	0.413	0.295	0.456
H_sh_female	0.473	0.150	0.479	0.166	0.499	0.178
H_cultivation	2.543	1.516	2.414	1.631	1.526	1.695
H_agri_labour	0.470	1.137	0.823	1.446	1.579	1.772
H_milk_sell	0.661	0.770	0.579	0.727	0.379	0.693
H_paper	1.586	1.255	1.247	1.219	0.978	1.160
H_radio	2.253	1.175	2.114	1.210	1.796	1.324
H_tv	2.511	1.004	2.196	1.183	1.844	1.290
H_I_Concentration	6714.867	1834.744	6801.312	1796.675	6864.169	1663.344
H_Membershg	0.487	0.648	0.416	0.601	0.417	0.586
V_hlthinfra	0.197	1.201	0.166	1.132	0.142	1.156
V_hlthdistance	0.000	0.732	-0.049	0.715	0.104	0.760
V_transport	0.041	0.763	0.055	0.791	-0.005	0.710
V_Naturalcdn	-0.039	0.999	-0.065	0.968	-0.084	0.796
D_panchayat	0.249	0.110	0.258	0.113	0.229	0.111
D_pcy	15022.910	4270.683	15332.850	3811.102	14800.610	4888.898
D_ healthinfra	-0.137	2.366	0.147	2.528	-0.375	2.303
D_hc_rpop	0.076	0.027	0.073	0.028	0.076	0.025
D_f_mem_gp	0.967	2.243	0.786	1.842	1.188	2.628

The latter are more likely to be landless agricultural labourers.They tend to have a lower per capita income and wealth, tend to have less chronic diseases, are more likely to belong to schedule castes/tribes, have lesser access to print or audio/visual media, tend to live further from a health facility in villages characterised by poorer health infrastructure, poorer transport infrastructure, poorer presence of panchayats (local governing bodies) and a greater likelihood of natural calamities. Such wide disparities between NYCH and NYNCH imply that the former would match to those YH which enjoy relatively higher economic and social status within the Yeshasvini group; the opposite would be true for the latter group. The results will have important implications in terms of the impact of membership on two different segments of the enrolees. Evidence suggests that the effect of health insurance is not uniform across income groups (Ekman 2007 and Wagstaff et al. 2008a for recent studies).

Matching on two socially and economically unequal untreated groups may provide useful information in that context.

Table 3 below reports the results of matching quality assessment tests[5]. It shows the mean absolute standardized 'bias' before and after matching and the percentage change in it achieved through matching. Also reported are the pseudo R^2 statistics from a probit model estimated on the matched and unmatched samples and the percentage reduction in it, for all the propensity score specifications. Finally, it shows the statistics of likelihood-ratio test of the joint significance of all the matching variables in the probit models before and after matching. It is evident that matching has achieved a significant reduction in mean absolute standardised bias on observables. The reduction in absolute terms is much larger when non cooperative households are used as controls. However in terms of percent change, the reduction in bias is larger (and the bias remaining after matching is smaller) when cooperative households are used as controls. This difference in results is simply because pre matching bias is a good deal larger for non cooperatives than for cooperatives (as control groups). As expected, pseudo R^2 has also reduced in the post matching scenario. One possible problem with these approaches, however, is that we do not have a clear indication for the success of the matching procedure.

Table 3: Results of the mean absolute standardised bias and pseudo R^2 tests

			Controls: Cooperative members			Controls: Non cooperative members		
	Untreated group		NYCH	NYCH	NYCH	NYNCH	NYNCH	NYNCH
Standardised	Treated group		YH	YH_B*	YH_+3*	YH	YH_B	YH_+3*
bias	Pre_matching	Mean	19.23	12.93	16.82	26.82	14.95	19.34
		STDEV	10.35	6.93	11.07	19.96	10.69	16.16
	Post_matching	Mean	9.45	3.56	4.26	14.05	4.81	5.47
		STDEV	4.95	2.64	3.08	11.40	3.15	4.85
	Abosulte change in bias		9.79	9.36	12.56	12.77	10.14	13.87
	Change (%)		50.88	72.44	74.69	47.60	67.84	71.73
Pseudo R^2	Pre_matching	Pseudo R	0.06	0.07	0.06	0.17	0.09	0.11
		Lileihood Ch2	231.59	31.27	183.22	192.62	39.23	264.00
		Chi sq	0.00	0.01	0.00	0.00	0.00	0.00
	Post-matching		0.05	0.06	0.06	0.13	0.07	0.08
		LLR	106.09	8.17	44.64	204.40	9.98	64.73
		Chi sq	0.00	0.94	0.00	0.00	0.87	0.00
	Change (%) in		10.34	17.14	6.78	23.53	25.84	23.81

[5] Results of the estimated propensity score functions are available on request.

	pseudo R^2							

B: Beneficiaries of the insurance programme; +3: Yeshasvini members for 3 years or more

ATT and ATE are defined only in the region of common support. Hence, an important step is to check the overlap and the region of common support between treatment and comparison group. The most straightforward one i.e. a visual analysis of the density distribution of the propensity score in both groups (Lechner 2000) is used for the analysis.

Figure 1: Propensity scores histograms

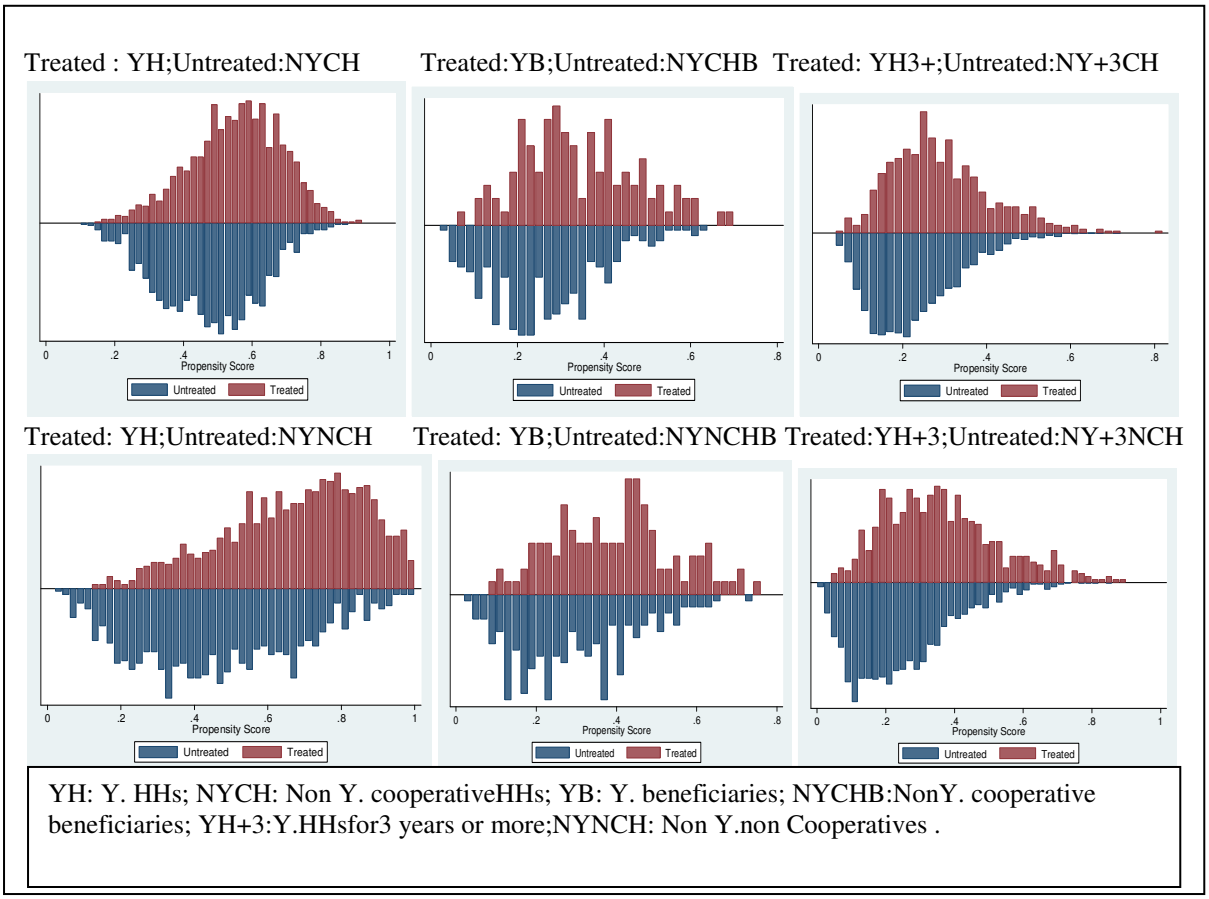

Fig. 1 shows histograms for the propensity density functions for the treated and untreated groups in the all the treated and untreated combinations that are specified earlier. Two observations may be made. One, as expected, the pre matching distributions are more skewed in the cases when the untreated group is NYNCH as compared to those cases where the untreated group is NYCH. Two, in both the cases, distributions are more skewed when the treated group constitutes those HHs who have been yeshasvini members for the past 3 years or more. The skewness notwithstanding, the region of common support is ample in all the cases. In the final estimation, we discarded observations outside the common support. Implementing the common support condition ensures that any combination of characteristics observed in the treatment group can also be observed among the control group.

6. Empirical Results

Health care utilisation

Outpatient care: Reported in Table 4 our results indicate that there were statistically significant differences in the average number of health care visits between insured (YH) and uninsured cooperatives (NYCH). Though the waiting time before the first appointment with a doctor did not appear to have been affected by insurance, the number of consultations and visits to medical facility when ill was 5 percent higher for insured cooperative members than their uninsured counterparts in the control group. Our results appear to be in sync with several studies that have shown that community financing of health care promotes the use of health care facility when ill (Ekman 2004, Wagstaff et al 2007 for references). However, the positive effects of the programme turned insignificant when non cooperatives (NYNCH) were used as the comparison group. There could be three alternative explanations. One, since cooperatives enjoy a higher economic and social status than non cooperatives, relatively better off Yeshasvini households (YH) would match with NYCH groups; and relatively weaker ones would match with NYNCH groups. And, there is evidence that the better off segment of the members benefits more from the insurance. Two, this could be due to adverse selection in the programme i.e. those cooperatives with poor health might have selected themselves in the programme because of their higher anticipated need while other – otherwise similar – persons did not enter into the programme. Three, the affordability of care results in increased self -reporting of illness, in particular, by those who are better informed (over utilization of health care use). We tested the frequency of self reported illness and found (Table 4) that the insured households reported 7 percent more cases of illness over the past 6 months than the uninsured cooperatives; the difference was insignificant when the comparison group was NYNCH. The increased use of health care by insured when the comparison was NYCH could thus be due to adverse selection/increased reporting of illness by YH.

We normalized the health care visits by the duration of sickness to analyse the intensity of health care use and performed the same test. The results show that the ATT is positive and significant when the comparison group is non cooperatives (NYNCH). The programme appears to have had a positive impact on the intensity of health care use among the insureds at the lower end of economic and social status. The difference was insignificant when NYCH

was the comparison group. While the possibility of adverse selection cannot be ruled out, increased reporting of illness seems to better explain increased use of health care among YH when compared to NYCH. Clearly, the programme has increased the use of health care services by increasing the reporting of illness amongst the better off sections of YH and through increased intensity amongst the relatively lower socio economic segment of YH. However, the effects are quite small varying between 4-7 percent.

Larger impacts appear to have occurred on the type of facility used for medical care. The use of private health facilities networked with the programme is unambiguously higher amongst YH as compared to the control groups. It may be recalled that OPD is free and lab tests are available at discounted rates for members in the networked hospitals. Interestingly, ATT is consistently negative and significant for government hospital use. Membership resulted in 20 percent reduction in govt facility visits despite the fact that the government services are provided free of any charge. Poor services, absenteeism, and corrupt practices could be cited as primary reasons. Price reduction thus appears to have had a significant impact on the use and facility of health care.

In-patient treatment: The differential effect on utilization of inpatient care between insured and non-insured groups was insignificant. The programme does not cover in-patient non surgery event. It was however expected that the income transfer effects of insurance could generate secondary effects to promote the use of those services that were not directly covered under the programme. But there is no such evidence of secondary effects.

Surgeries: Impacts of health insurance seem to be the most pronounced in the use of surgeries. Insured cohorts reported more surgery cases than the uninsured ones during the past 4 years, the time frame used for the evaluation of surgery impacts. The effect was much larger when the comparison was made with the less privileged NYNCH group. Individuals suffering from chronic illness were asked whether they would undergo surgery if prescribed by the doctor. A significantly larger number of them responded in affirmative. Since the programme focuses on surgical procedures, the results are not unexpected. Furthermore, quite understandably, YH used yeshasvini facility, in particular, in the private sector. The use of government facility was consistently less irrespective of the control group selected.

Maternal health: There had been no appreciable impact of the programme on maternal health care. Though the number of visits to hospitals for check ups is 6-7% higher for YH, the difference is not statistically significant due to large standard deviation. The reason could be that normal deliveries were not covered until recently by the programme. Now when they are covered, the price fixed is as low as Rs. 800. The price for caesarian delivery has been fixed at Rs 5500 which is almost 3 to 4 times lower than the market rate. Doctors are highly critical of these uneconomical rates and are unwilling to take up such cases. Finally, government hospitals charge nominal fee for caesarian while normal deliveries are free. Considering that the procedures in these cases are technically standardized, people prefer government facilities in such cases. Thus, the members do not appear to have benefited significantly so far as maternal health is concerned.

Table 4: Differences in health case utilisation indicators based on Propensity score matching Kernel method

	Untreated : Non yeshasvini cooperative HHs						Untreated : Non cooperative HHs					
Variable	ATT	SE	%change	Tstat	Unt	Treated	ATT	SE	Tstat	%cha	Untreat	Treated
Op_no_fac_visited	0.070	0.033	5.47	2.14	1,038	1137	0.033	0.051	0.64	2.51	661	945
Op_consulted	0.063	0.023	5.06	2.69	1038	1485	0.030	0.039	0.77	2.38	661	945
Op_sickdays	0.174	0.094	6.97	1.84	1391	1485	-0.049	0.134	-0.37	-1.87	884	1,250
Op_sicktime	0.056	0.028	6.97	2	1391	1485	0.003	0.048	0.06	-1.87	884	1,250
Op_no_fac_days	0.004	0.008	0.38	0.48	1,038	1,137	0.020	0.010	1.92	2.04	661	945
Op_consul_days	0.005	0.010	1.16	0.55	1,038	1,137	0.020	0.017	1.19	4.55	661	945
Op_wait_sicktime	0.079	0.060	6.30	1.32	1,038	1,137	-0.084	0.115	-0.73	-5.87	661	945
In_pat_no	-0.007	0.013	-6.58	-0.56	1,391	1485	0.004	0.021	0.17	3.75	884	1,250
Surg_no	0.064	0.019	37.77	3.36	2,122	674	0.061	0.026	2.35	1552.00	587	
Mat_visit	0.112	0.075	7.31	1.49	230	370	0.099	0.093	1.06	6.31	165	59
Surg_percep	0.090	0.023	159.43	3.97	262	370	0.070	0.036	1.97	99.74	154	319
Op_shr_pvt	0.030	0.017	4.43	1.81	1026	1,137	0.028	0.021	1.32	4.08	661	945
Op_shr_yesh	0.031	0.005	9737.53	5.73	1026	1128	0.030	0.005	5.53	1226.64	655	938
Op_shr_govt	-0.061	0.017	-20.05	-3.54	1391	1128	-0.062	0.027	-2.32	-20.21	655	938
Surg_shr_govt	-0.248	0.038	-86.90	-6.47	261	107	-0.262	0.044	-5.95	-88.11	237	113
Chro_fac	2.744	2.242	3.34	1.22	251	370	1.715	3.156	0.54	2.09	154	319

We conducted a survey of network hospitals to gauge their experience and opinion about the programme through a structured questionnaire. Over seventy five percent of the respondents revealed that they expanded facilities either in the year they entered the Yeshasvini network or after that. We asked them to evaluate the benefits of networking with the programme on a likert scale of 0 to 5. For each benefit, a weighted index was created by weighting the number of responses in each rank, weights being the rank assigned to each benefit. It was divided by the maximum value that could be assigned to a benefit. The weighted index of

response was almost 50 percent. T-statistics of the weighted mean response turns significant in one tailed test in all the cases.

Table 5: Benefits from the programme: Hospitals' perspective

	Weighted index of response (%))	Mean response	Std Dev.	T-stat
Did not lose competition	52.08	20.83	15.65	1.33
Increased turnover	45.83	18.33	14.11	1.30
Increased capacity utilization	53.75	21.50	18.97	1.13
Expansion	45.42	18.17	14.32	1.27

Our results thus reveal that the programme has improved utilisation of health care amongst different segments of the insureds by reducing the price and making health care affordable in those medical events which are directly covered under the programme. Secondary effects of insurance are insignificant. Furthermore, the mean effects are small where the benefits are small (for instance in primary health care, where the hospitals offer free OPD with lab tests at self-determined concessional rates). However, at the macro level, these effects seem to have translated into a significant difference for the service providers.

Financial protection

A good insurance programme is not just about improving access to health care facilities. One of its primary objectives is that people are protected from the financial consequences associated with the use of medical care. An important policy objective of insurance is to reduce individual payment at the time of medical emergency. Empirically, 'out-of-pocket' expenditure is used as an indicator of financial protection. However, as discussed above, we have used borrowings/sale of assets resulting from medical payments as an indicator of financial protection. Our results reveal that in the events which are covered by the programme, health payments caused significantly less indebtedness. Most importantly, surgical procedures have resulted in significantly less indebtedness/sale of assets which have the most pronounced impoverishment effects. In general, total borrowings are more than 30 percent less for YH than for the control groups. The out of pockets (excluding borrowings/asset sale) expenditure are more than 46 percent less in regard to both the control groups. Thus, there is strong evidence of financial protection offered by the programme in the cases of surgical treatment where the programme has a significant direct price reduction effect. However, in line with our expectations, the impact is not so significant for

hospitalization or maternal cases. In fact, in-patient treatments other than surgery resulted in increased borrowings for the YH group. Overall health expenditures are 19-20 percent higher for YH as compared with uninsured cooperatives but the difference in health expenditures between YH and NYNCH is insignificant. This could be because the self reported illness was higher for YH when compared with NYCH.

Table 6: Differences in financial protection indicators based on Propensity score matching Kernel method

	Untreated : Non Yeshasvini cooperative HHs						Untreated : Non cooperative HHs					
	ATT	SE	%change	Tstat	Untre	Treat	ATT	SE	Tstat	%cha	Untre	*Tre*
Op_shr_bor	-0.012	0.017	-8.82	-0.72	840	947	-0.053	0.026	-2.08	-29.44	544	727
In_pat_bor	1919.04	902.174	130.50	2.13	840	929	549.286	2009.17	0.27	19.60	66	107
In_pat_shr_bor	0.080	0.046	31.51	1.74	125	143	-0.068	0.081	-0.84	-17.73	64	105
Surg_own_payment	-3961.84	1192.846	-47.88	-3.32	261	107	-3611.8	1199.7	-3.01	-46.67	237	113
Surg_shr_bor	-0.29	0.036	-65.62	-8.29	261	79	-0.295	0.043	-6.91	-64.77	237	113
Surg_bor	-4029.95	2785.733	-34.03	-1.45	261	107	-2845.03	2104.49	-1.35	-26.90	237	113
Mat_shr_own	-0.09	0.083	-10.14	-1.06	53	143	0.000	0.128	0	0.00	32	13
Health_exp	43.51	15.850	19.55	2.75	1,190	1,451	20.287	21.98	0.92	8.24	800	1,096
Shr_health_exp	0.010	0.004	12.66	2.39	1,190	1451	0.005	0.004	1.25	6.67	800	1,096
Percapita_health_exp	4.97	4.423	9.69	1.12	1,835	669	-0.785	4.312	-0.18	-1.39	1,395	505

Treatment outcome

The satisfaction level was significantly higher for YH than what was reported by their uninsured cooperative counterparts. The effect was 5-6 percent. Similarly more YH individuals felt that they could work regularly after the treatment than the NYCH individuals. The difference disappeared when the comparison was made with non cooperatives. Treatment outcomes thus appear to be more satisfactory for better off households. Income loss and day loss are not significantly different. However when adjusted for income, income losses turned significantly less for the YH group than the matched NYNCH group. Considering that matched households are compared, adjustment by income may have yielded an underestimated income loss effect for YH.

There is no perceptible better outcome in the maternal care but it may be noted that caesarean cases for yeshasvini households are less than those for non yeshasvini households belying the

general notion that the programme encourages caesarean deliveries. This could be because the rate fixed by the Trust for caesarean delivery is as low as Rs. 5500 while the market rates vary from 15,000 to 20,000. Treatment outcomes of surgery treatments are most pronounced. Significantly more yeshasvini households reported better life and lesser requirement for post surgery processes. This is a significant result as it indicates that lower rates and tight monitoring of the hospitals may result into more efficient use of medical processes. Surgery is performed where it is necessary. Thus the beneficiary seems to be more satisfied with the outcome. There is no post surgery care covered in the treatment. This seems to have prevented unwarranted use of post surgery medical care for the patients. Further, treatment outcomes are appreciably better for YH when the comparison is made with NYCH. The difference between YH and NYNCH is statistically insignificant. Higher satisfaction levels are reported by the better off sections of the insureds.

Table 7: Differences in treatment outcome indicators based on Propensity score matching Kernel method

	Untreated : Cooperative non yeshasvini HHs						Untreated : Non cooperative HHs					
	ATT	SE	%change	Tstat	Untreat	Treated	ATT	SE	Tstat	%change	Untreat	Treated
Satisfacn_level	0.054	0.027	5.34	1.99	1,065	946	0.017	0.034	0.52	1.70	675	968
Dayloss_sicktime	0.578	0.534	9.33	1.08	1,028	370	0.687	0.779	0.88	10.75	650	924
Incomloss_inc_sicktime	0.000	0.000	4.03	0.53	998	1,115	0.000	0.000	-1.53	-21.37	629	902
Incomeloss_ratio_inc	0.000	0.000	5.75	0.76	1,148	1,080	0.000	0.000	-2.36	-26.34	755	1,060
Work_regular	0.076	0.024	7.01	3.18	1,065	1,131	-0.01	0.046	-0.22	-0.88	675	968
Full_satisfacn	0.041	0.031	6.17	1.31	1,065	1,162	0.011	0.047	0.24	1.63	675	968
Surg_requirepostsurgery	-0.059	0.054	-9.26	-1.08	256	107	-0.045	0.069	-0.65	-7.35	231	111
Surg_careratng	-0.053	1.993	-0.06	-0.03	250	106	-0.035	1.703	-0.02	-0.04	222	110
Surg_lifeimproved	3.803	2.409	4.56	1.58	253	104	2.671	2.150	1.24	3.13	229	110
Surg_post_workregularly	2.421	2.040	3.05	1.19	253	104	0.668	2.252	0.3	0.83	232	110
Surg_visitsreduced	-1.368	3.303	-1.65	-0.41	255	104	1.187	3.788	0.31	1.47	232	110
Surg_moneysave	4.964	2.760	6.7	1.8	255	104	4.331	3.508	1.23	5.0	232	110
Surg_regularcheckup	0.438	3.072	0.94	0.14	186	104	-0.517	3.506	-0.15	-1.09	158	83
Mat_abnor_del	0.003	0.011	14.65	0.3	607	78	0.011	0.012	1.01	54.80	442	163
Mat_caesarian	-0.0415	0.037	-20.57	-1.11	597	201	-0.054	0.034	-1.71	-25.18	436	162

Economic status

Insurance results in greater use of health services, more satisfactory treatment outcomes and less borrowings/sale of assets. Considering that people in rural areas rely mainly on their

own labor and on assets such as livestock for income generation, a serious decline of income can be prevented when productive assets are protected and people recover more satisfactorily (Jutting 2004). Consumption will be more stable and probably even higher, thereby positively affecting the health of all household members. Both increased consumption and better health contribute to overall income. This in turn is expected have a positive impacts on savings. Our results support these hypotheses *albeit* weakly. Post matching, there is a significant difference in consumption and savings between the insured and uninsured households. Increase in income has also been significantly more pronounced for the insured across both groups. In general income effects are larger for the members with lower economic and social status. But surprisingly borrowing also emerged significantly higher for YH when the control group was non cooperative. It could be that insurance induced feeling of empowerment is stronger at the lower levels of incomes. This in turn generates larger impacts on the behaviour of households.

Table 8: Differences in economic well being indicators based on Propensity score matching Kernel method

	Untreated : Non yeshasvini cooperative HHs						Untreated : Non cooperative HHs					
	ATT	SE	%chng	Tstat	Untrea.	Trea.	ATT	SE	Tstat	%cha	Untrea	Trea.
Total_exp	164.044	91.913	5.69	1.78	1,386	1,296	135.3616	116.6074	1.16	4.62	881	1,244
Percapita_exp	39.910	19.683	6.86	2.03	2,116	78	24.730	19.301	1.28	4.09	1,547	583
Cumbor_inc	0.021	0.021	15.31	0.99	1,890	573	0.073	0.017	4.34	83.05	1,336	508
Cumsav_inc	0.015	0.021	7.06	0.7	1,890	573	0.046	0.022	2.07	25.09	1,336	508
Cumassetsold_inc	0.006	0.008	55.83	0.73	1,890	573	0.008	0.007	1.15	100.49	1,336	508
Cumasspur_inc	-0.017	0.021	-25.12	-0.79	1,085	573	0.009	0.017	0.55	23.20	621	259
Inc_grth	0.033	0.009	58.27	3.6	1,890	253	0.027	0.010	2.56	41.91	1,336	508

7. Administrative and Fiscal cost

The programme is benefited by the presence of a vast administrative infrastructure of the Department of Cooperation. District level deputy registrars coordinate and monitor the programme with one Yeshasvini coordinator. There is no separate infrastructure. At the centre, there is a CEO who is assisted by a FHPL coordinator. She has a staff of some 8-10 persons who assist her in claim settlement and receiving pre authorization by a team of doctors. Hospitals themselves need to create facilitating infrastructure for Yeshasvini members. For instance, they employ an exclusive staff for guiding yeshasvini members, set up exclusive yeshasvini counter, and have a dedicated telephone line. The Trust does not bear these expenses. This produces significant economies for the Trust. Table 9 shows the

administrative cost of the Yeshasvini programme. The cost per member including the fee of the FHPL is as low as Rs. 3.82 per member. The FHPL charges amount to less than Rs 2 and is likely to come down further this year which the enrolment of 3 million members.

Table 9: Administrative cost of Yeshasvini

Cost heads	2003-04	2004-05	2005-06	2006-07
Advertisement & Publicity	511291	604000	67888	658485
Implementing Agency Fees	5900000	2100000	5000000	4000000
Administrative cost per member	3.63	4.20	4.03	3.82
implementing agency fees per member	2.80	1.43	2.70	1.73
Government subsidy (Rs. Mn)	45	35.8	110	208.5
Government subsidy per member (Rs)	28.125	17.72277	74.82993	112.7027

Source: Yeshasvini Trust

The fiscal cost per member too is quite low. Better care, greater financial protection and better treatment results could be ensured at the fiscal cost of Rs.112 per member per year.

8. Conclusion

This article examines evidence on the impact of being insured by Yeshasvini community health financing in India on healthcare utilization, financial protection, treatment outcomes and economic well being. Our results uphold an association between insurance by yeshasvini and better healthcare utilization. We also observed increased intensity of health care use amongst relatively lower social and economic segment of the insureds. In micro terms the effects on primary health care are rather small, in particular, for the members having relatively lower economic and social status. For surgical treatment however they are substantially large. It could be that because these people lacked the resources to pay for surgical treatment, they were avoiding going for care. The programme made highly sophisticated surgical treatments affordable for them. To that extent the scheme is found to be successful. Furthermore, at the macro level, this programme has had an important impact on the expansion of health care services by providers. With over 70 percent of population excluded from the quality treatment, it is difficult to achieve economies of scale in the health care sector. This creates a vicious circle of high cost and non accessibility of treatment. Our findings suggest that a successful CBHI programme can break this vicious circle effectively.

Affiliation to the programme is voluntary. It is often argued that voluntary affiliation to health insurance is attractive mainly to bad risks and therefore they are subject to adverse selection. It must however be noted that the objective of CBHI is very different from that of private health insurance. While commercial viability based on subscription is an important objective of private health insurance, community health financing aims at making health care affordable to the poorer sections of the society. Exclusion of high-risk individuals from programme membership will affect the sickest and probably most vulnerable members of the population. Increasing premium levels will discourage the poor from joining. Placing limitations on a benefit package will most likely reduce the level of effective protection provided against financial risk. While this will affect all income groups, it may have the most severe consequences for the poorest. But at the same time, there is no CBHI that can, on sustained basis, offer a benefit package that is comprehensive in nature because the programmes are voluntary and contributions are small. Financial sustainability thus remains an issue. The managers of the yeshasvini programme have been trying to maintain low operational costs and a fixed surgery price schedule. The rules for reimbursement are also made more stringent. However these steps have created dissatisfaction among hospitals. There is a general feeling that the prices fixed for most of the procedures are inadequate and irrational. Hospitals cannot cover even the cost. Most hospitals do not have in house facilities for all types of surgeries. They have free lance doctors on their panel. It is not financially viable to seek their services at the rate prescribed by the programme. Furthermore, for any additional medical process required at the time of surgery for which pre authorisation is not taken, hospitals cannot claim money. It is suggested therefore that the managers should augment the resources. Introduction of a sliding contribution scale rather than a single flat rate contribution, family packages, and additional services in terms of health checks may improve membership and collection of resources. Strategies may be adopted to increase levels of trust through information dissemination.

There is strong evidence that the programme provides financial protection by reducing borrowings/ sale of assets and out-of-pocket spending (including payments out of savings) in respect of the benefits that it covers. In general, the effects are appreciably higher for catastrophic surgery events which are directly covered by the programme than the others. Treatment and economic outcomes are also positive but vary across socio economic groups of population and the type of medical events. The programme thus appears to be successful

in extending the poor the benefits in catastrophic medical events despite small contributions and presents an interesting case study.

It is therefore suggested that the membership should be made compulsory along the lines of social insurance. The vast cooperative infrastructure not only in this state but also in other states of the country can use this institution to take a leap forward in the direction of implementing social insurance for the unorganised sector in the rural areas which is organised through the cooperative network. This would also help in creating large pool of resources and offering better package of services. The main finding is that these types of community financing arrangements can be effectively implemented if there is transparency and accountability among those managing the scheme. The policy implication is that the successful programmes need to be carried to the next level.

APPENDIX TABLES

A1 : Dependent variables

Health care utilisation		
Outpatient treatment	Op_no_fac_visited	No. of hospitals visited during the past 6 six months
	Op_consulted	Number of times consulted the doctors
	Op_consul_days	Number of times consulted to sickdays ratio
	Op_wait_sicktime	No. of waiting days to no. of sick times ratio
	Op_shr_pvt	Proportion of cases when private (institutional) facility was visited
	Op_shr_yesh	Proportion of cases when yeshasvini facility was visited
	Op_shr_govt	Proportion of cases when government facility was visited
Hospitalisation	In_pat_no	No. of times hospitalization cases occurred
	In_pat__qlt	Weighted average of the facility visited, the highest weightage given to yeshasvini facility
Chronic	Chro_sur_percep	=1 if the responsent is willing to undergo surgery if prescribed =0, otherwise
Maternal healthcare	Mat_visit	No. of visit for chechup before delivery
	Mat_fac	Weighted average of the facility visited, the highest weightage given to yeshasvini facility
Surgery	Surg_no.	=No. of surgery cases during the past 4 years
	Sur_shr_gov	Weighted average of the facility visited, the highest weightage given to yeshasvini facility
	Sur_checkup_post	How frequently post surgery check ups are taken on a likert scale 0 to 5.
Financial proetction		
Outpatient treatment	Op_shr_bor	Share of borrowing in total treatment expenditure
	Op_bor	Total borrowing due to treatment
Hospitalisation	Inpat_shr_bor	Share of borrowing in total pexpenditure

	inpat_bor	Total borrowing due to treatment
Delivery	Mat_shr_own	Share of own expenditure in total pexpenditure
Surgery	Surg_bor	Total borrowing due to surgery
	Sur_own	Share of own expenditure in total pexpenditure
Treatment outcome		
Outpatient	days_loss_sickdays	No. of sick days' lost to sick days' ratio
	incomeloss_inc	Income lost to income ratio
		Income lost per day to income ratio
	fully_recover	=1 if fully recovered ,=0 otherwise
	fully_satis	=1 if fully satisfied, =0 otherwise
Delivery	Mat_abnor_del	=1 if miscarriages/dead child born/infant death after sometime
	Mat_caesarian	=1 for caesarian cases
Surgery	Surg_post_procd	Rating on a likert scale from 0-5
	Surg_carerate	Rating on a likert scale from 0-5
	Surg_better_life	Rating on a likert scale from 0-5
	Surg_regular_work	Rating on a likert scale from 0-5
Health Status and awareness		
	Op_sickdays	No. of sickdays to household size ratio
	Op_severity	No. of sckdays to sicktimes ratio
	Shr_helth_exp	Share of helath expenditure in total HHexpenditure
	Per capita Health _exp	Health expenditure by household size
Economic well being		
	Cumbor_inc	Cumulative borrowing in three years to income ratio
	Cumsav_inc	Cumulative borrowing in three years to income ratio
	Cumassetsold_inc	Cumulative borrowing in three years to income ratio
	Cumasspur_inc	Cumulative borrowing in three years to income ratio
	Chng_inc_inc	Change in income to income ratio (growth of income)

A2 : Independent Variables

Economic	**Description**
Households	H_I_Concentration : H index of the share of income-source in total income
	Perincome: per capita net income of the household
	H_asset: index of durable products in the household (based on PCA)
	H_cultivation : The share of cultivation in total income on likert scale of 0 to 4
	H_agri_labour : The share of wages from agricultural labour in total income on likert scale of 0 to 4
	H_milk_sell: The share of income from milk selling on likert scale of 0 to 4.
Village	V-Wtr_san : PCA based index of water and sanitation conditions in a village
	V_Livincdn: Index of living conditions (PCA based)
	V_Naturalcdn: No. of beneficiaries of natural disaster as percentage of total population
District	D_PCY : per capita income
Education	
Households	H_Headeduyears : number of education years of the head family
	H_Headedustatus := 1 for illiterate, 2 for primary, 3 for secondary, 4 senior secondary; 5 for higher education and 6 for professional education
	H_Aveduyears : average education years of the household
	H_Demodiage: Members in agegroup 15-60 as percentage of household memebrs
Social	
Households	H_Sc_group: =1 if belongs to SC/ST
Behavioural/awareness	
Households	H-paper: Frequency of reading newspaper on a likert scale of 0 to 4 H-TV: Frequency of watching TV on a likert scale of 0 to 4 H-radio: Frequency of listening radio on a likert scale of 0 to 4 H-Membershg: =1 if emmber of SHG =0 otherwise

Demographic	
Households	Hsize: household size
	H_Secitizen: members with 60 years and above age
	H_Sh_female : Share of female members in the household
	H_Headage : Age of the head of the family
	H_demodivage = number of members in working age group as percentage of household size
Health	
Households	H_Dumchronic=1 if at least one member has chronic disease; =-0 otherwise
Village	V-hlthinfra : Index of health facilities based on PCA
	V-hlthdistance: Duistance from the nearest health facility
	V_transport: Index of transport facilities (based on PCA)
	Y-dist : distance of the nearest Yeshasvini facility
District	D_ healthinfra : Index of the quality of district level health infratsructure
	D_hc-rpop : Community health centres to population ratio
	D-tpt: PCA based index of district level transport facilities
Y-related information	
Households	YH= 1 if at least one household member is yeshasvini member; =0 otherwise
	YH_B: =1 if the household is Yeshasvini beneficiary (has availed benefit); =0 otherwise
	YH_+3: =1 if the household has been continuing member of Yeshasvini for the past 3 years or more; =0 otherwise
Cooperative	
Village	V_copop : cooperative societies per capita
Governance	
District	D_panchayat : No. of panchayats adjusted by the number of villages
	D_f_m_gp : female membersin gram panchats as ratio of total members

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