

# **Evaluating Innovation in Health Care Services: Impact of Yeshasvini Health Insurance Programme on Health Care Utilisation among Women**

Aradhna Aggarwal

## **Abstract**

Using the Propensity Score Matching technique, the study evaluates the impact of India's Yeshasvini community based health insurance Programme on utilisation of health care, the intensity of use and financial protection among women. 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. Quantitative explorations of the database reveal that the Programme has had a significant impact, among women, on the use highly catastrophic medical events which are directly covered by the Programme. However, it is not found to be effective in increasing primary health care utilisation among them. While the add-on effect is insignificant, it has significantly shifted the preference of the insured households to the use of better health care facilities for the treatment of women and has offered significant financial protection to them. 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.

## **1. Introduction**

The growing interest within the international development community in addressing the health issues has led to a new holistic health strategy emphasizing the individual's, the family's and the community's responsibility for health and health financing (WHO 2000, 2001). The Macro Commission on Health (WHO 2001, p. 60), for example, recommended that, "out-of-pocket expenditures by poor communities should increasingly be channeled into "community financing" Programmes to help cover the costs of community-based health delivery'. In recent years, therefore, most national governments in developing countries have been trying to promote community based health insurance Programmes (CBHI) as part of their health policy. CBHI is a form of social insurance at affordable prices which is designed to help poorer sections of the population by pooling the risks of ill health and thereby increasing access to healthcare through pre-payment of premiums. It involves voluntary and contributory Programmes for the

community that offer limited protection at a low contribution. CBHI has thus emerged as an important innovation in the evolution of an equitable health financing mechanism.

While evaluating the impact of CBHI Programmes most empirical studies focus on ‘health care utilization’ as an important variable. Though the results are ambiguous, there is moderate to strong evidence that these Programmes have a positive impact on the use of health care services by the poor. An important question that has received scant attention in the literature, however, is whether or not these Programmes serve as an effective instrument in providing health security to the most vulnerable section of the society namely, the poor women. To the best of my knowledge, none of the existing studies has integrated a *gender perspective* in the analysis. This study proposes to fill this important gap in the literature. It focuses on one of the largest CBHI Programmes in India : “Yeshasvini Health Insurance Programme for the rural poor” in Karnataka and evaluates its effects on health care utilization among the rural women. While doing so, it distinguishes between surgical treatment and primary health care utilisation. A household in which at least one member has received ‘surgical treatment’ free under the Programme is termed as beneficiary of the Programme because the main purpose of this Programme is to cover surgical treatments. Other benefits are secondary to it. Thus the major objectives of the study are to

- analyse the patterns of membership and beneficiaries from the gender perspective;
- examine, quantitatively, the significance of female participation in the Programme both as member and beneficiary; and
- evaluate the impact of Programme on primary health utilisation and financial protection.

It uses both the traditional and statistical randomized experimental methods (better known as the ‘propensity score matching methods’), which are being popularized by the World Bank in health impact assessment.

The study begins with explaining the importance of evaluating the Programme from the gender perspective, in Section 2. Section 3 describes the core characteristics of “Yeshasvini” and examines the patterns of female participation in the Programme. Section 4 discusses the methodology and data. Section 5 focuses on the propensity score function. Section 5 analyses the

factors that influence participation in the Programme, from the gender perspective; and describes empirical results based on propensity score matching method. Finally Section 6 sums of the study and draws policy implications.

## **2. Why the gender perspective?**

Evidence suggests that females experience more episodes of illness than males, in particular in developing countries, but are less likely to receive medical treatment before the illness is well advanced. Nutritional status of women and girls is compromised by unequal access to food, by heavy work demands, and by special nutritional needs (such as for iron). Furthermore, they are often trapped in a cycle of ill health exacerbated by childbearing and hard physical labor. Women, especially in agricultural areas, are expected to perform a variety of strenuous tasks within the household, on family lands, and, in some regions, for wages. These occupations often have serious consequences for undernourished females, including adolescents, whose bone structure is not yet fully developed and who may be required to carry heavy loads or to adopt unnatural postures for prolonged periods. Another problem is exposure to heavy smoke from kitchen fires, which causes a variety of respiratory difficulties. Women are also susceptible to unusually high rates of physical assaults such as rape, burning, and beating.

Despite their serious health problems they do not get adequate levels of preventive care. They are dominated not only by the men they have married but also by their in laws. The money they earn, the dwellings in which they live, and even their reproductive decisions are not theirs to control. In addition, the work they perform is socially devalued. The consequences of women's unfavorable status in inherently inequitable social system prevalent in most developing countries include discrimination in the allocation of household resources including those for health care. In case they lose their husbands, they are socially marginalized which means poorer nutrition, and hence, poorer health. Women's health is a matter of serious concern at both, national and individual levels. It has consequences not only for the women themselves but also for the well-being of their children (particularly females), the functioning of households, and the distribution of resources. It affects the children's health and reduces their productivity, not only at the

household level but also in the informal and formal economic sectors. Improving women's health is integral to social and economic development.

Women's health therefore has been accorded a high priority by the international community (WHO 2005). Of the eight 'Millennium Development Goals' (MDG) three pertain to women's health. The MDG number 5 is related to maternal health and targets to reduce the maternal mortality ratio by three quarters, between 1990 and 2015. The MDG number 4 targets to reduce the under-five mortality by two thirds while MDG3 is related to promoting gender equality and empowering women. All these goals are interrelated. For instance, a lower maternal mortality ratio is a prerequisite for the attainment of MDG 4 and it will be virtually impossible to achieve improvements in maternal and under-five health without reducing gender inequalities, which in turn would impinge on women empowerment. Poor women health is therefore an area that should receive more attention.

Apparently, women comprise the key stakeholders in health policy debates. The focus of any social health insurance Programme should therefore be to ensure that the Programme provided is just as attractive to women as it is to the men and that it is effective in attracting their participation and providing health access. Against this background it is important to analyse Programmes in health financing from a gender perspective.

### **3. The Community Based Health Insurance and Health care utilisation: Theoretical Model and Hypothesis**

'A CBHI Programme is any program managed and operated by a community-based organization, other than government or a private for-profit company, that provides risk-pooling to cover the costs (or some part thereof) of health care services. They may be organized around geographic entities (villages or cities), professional bodies (institutions, cooperative societies or trade unions) or around health care facilities' (Tabor 2005, p.13). They are initiated and run by NGOs, cooperatives, workers' unions, associations, local government, or religious congregations, whose main area of work puts them in direct contact with the target groups. Hospitals may also initiate such Programmes. Under these Programmes a group of people comes together and voluntarily contributes small amounts to a common fund. When any of the members contributing to this fund

falls sick and needs money for treatment, he can use the money from this pool. CBHI thus incorporates the principles of risk-pooling and resource-sharing. In general, the Programmes offer limited protection at a low contribution and aim at the poorer sections of the society. The term CBHI is a generic term. CBHI Programmes are known by different names in different parts of the world, including: micro-insurance, community health finance organizations, mutual health insurance Programmes, mutuelles' pre-payment insurance organizations, voluntary informal sector health insurance, mutual health organizations/associations, community health finance organizations, and community self-financing health organizations (Dror and Jacquier 1999, Criel 2000, and Atim 2001). It covers several types of health financing arrangements which share the following common characteristics (Atim 1998, Hsiao 2001, Musau 1999, Dror and Preker 2002 among others; Jakab and Krishnan 2001 for survey):

- One, the community is actively engaged in collecting, pooling and allocating, supervising, and managing the resources for health financing.
- Two, the beneficiaries are predominantly low income population from informal sectors.
- Three, participation is voluntary.
- Four, the structure of resource mobilisation and benefits is based on the local realities and is commonly accepted.
- Five, the primary purpose is not profit making.
- Finally, their design, functioning, and implementation are shaped by the local contexts in which they emerge.

Theoretically, the Community Health Insurance Programmes are supposed to reduce health care costs through affordable premiums. Furthermore, while the commercial health insurance Programmes are often at an informational disadvantage and face high transaction costs, CBHI Programmes are rooted in local organizations and cut transaction costs to offer cheaper alternate health insurance arrangement (Jutting 2003, Wiesmann & Jutting, 2001) to the poor. If the Programmes have been initiated by the health providers, or tend to be set around the providers themselves (Atim, 1998; Musau, 1999) then both financing and provision aspects are tackled simultaneously. Thus CBHI makes insurance affordable to the poor and has price reducing effect that increases the demand for medial services.

Nyman (2000) shows that the increase in health care utilization is more than what can be explained by the price effect alone. According to him this is explained by the income effect. An insurance contract is a voluntary *quid pro quo* exchange where many consumers pay a premium in exchange for a claim on the pooled premiums, contingent on becoming ill. The smaller the probability of illness, the smaller is the premium that each purchaser of insurance must pay for any given payoff if ill. The difference between the payoff and the premium is a transfer of income from those who remain healthy to the person who becomes ill. Health insurance is purchased to obtain this income transfer when ill. Because of this income transfer, those who become ill purchase more health care (and other goods and services) than they would without insurance. Without insurance, the consumer who becomes ill maximizes the utility function:

$$\begin{aligned} & \max U_s(M, Y) \\ \text{s.t. } & Y_o = M + Y, \quad (1) \end{aligned}$$

where  $U_s$  is utility when ill,  $M$  is medical care,  $Y$  is income spent on other goods and services, and  $Y_o$  is the endowment. The price of  $M$  is assumed to be normalized at 1, so the first order conditions are:

$$U_{sM}/U_{sY} = -1 \quad (2)$$

$$Y_o - M - Y = 0, \quad (3)$$

and demand for medical care without insurance is written  $M_u = M(1, Y_o)$ . With insurance that pays off by reducing the price of  $M$  from 1 to  $c$ , the ill consumer's utility function now is:

$$\begin{aligned} & \max U_s(M, Y) \\ \text{s.t. } & Y_o - R = cM + Y, \end{aligned}$$

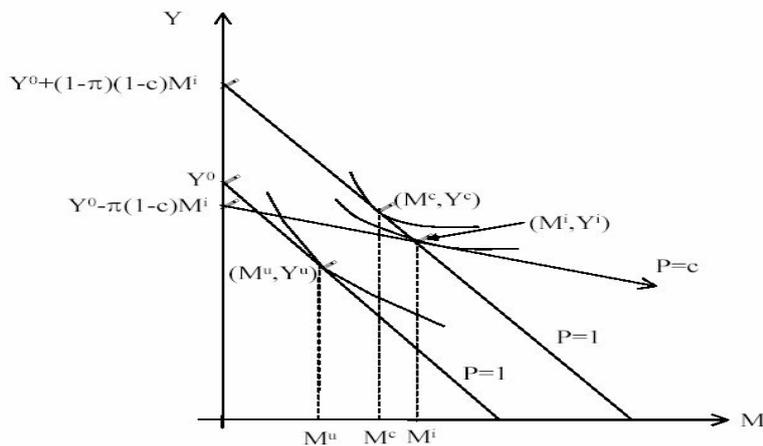
The premium is assumed to be actuarially fair, such that,

$$R = p(1-c)M_i,$$

The difference between the premium and the payout in expenditures is paid for by the many purchasers of insurance who remain healthy and transfer their premium through the insurer to those consumers who become ill. That is, the net payoff to each ill consumer is an income transfer from the  $(1-p)/p$  consumers who pay their premium into the pool but, because they remain healthy, have no claims on the pool. Figure 1 shows health care spending of the ill consumer both without insurance and with insurance that pays off by reducing the price of care from 1 to  $c$ , with a probability of illness,  $p$ , that lies between 0 and 1. Without insurance, optimal consumption by the ill consumer is  $(M_u, Y_u)$ , and with insurance, optimal consumption is  $(M_i,$

$Y_i$ ). The movement from  $(M_u, Y_u)$  to  $(M_i, Y_i)$  comprises of two effects : income transfer effect and price effect. Income transfer from healthy consumer shifts the equilibrium from  $(M_u, Y_u)$  to  $(M_c, Y_c)$  while the pure price effect results in substitution of other goods by more medical care. Thus, the pure price effect of insurance would be the increase in medical care consumption caused by using a price reduction rather than lump-sum income payments as the payoff mechanism, or  $(M_i - M_c)$ . The income transfer effect of the price-payoff insurance would be the increase in medical care consumption caused by the contingent-claims (lump-sum payoff) insurance compared with consumption with no insurance, or  $(M_c - M_u)$ .

**Figure 1: Effects of Insurance on health care utilisation**



Source: Nymann (2000)

Insurance is thus likely to have a substantial effect on the use of medical care and is positively related to the gap between the premium and payoff. This effect is likely to be more pronounced in the case of CBHI Programmes, particularly when they cover cost of hospitalization. This is because the premium is small and flat but payoffs are large in such Programmes.

However, an important question is whether these Programmes affect health care utilization among women. Since most Programmes are based on individual enrolment (Devadasan et al 2004 for India), it is likely that due to their socio-economic status, income constraints and

behavioural factors, women are excluded from these Programmes<sup>1</sup>. Furthermore, it is expected that most Programmes, in particular those that are common to both men and women, are not gender sensitive. If the services that such institutions offer are not appropriate for women clients and do not respond to their needs and sensitivities then these facilities are not expected to improve access to health care services among them. We therefore expect that the female coverage is significantly lower than the male coverage in CBHI Programmes and that these Programmes may not have significant impacts on the female health care utilization.

Empirically, access to health care utilization has been assessed by comparing utilization rates of members and non members or by making a before -after appraisal. Several studies have found an increased use of health care services across countries with such diverse setting as China (Bogg 1997); Congo (Criel and Kegel 1997); Ghana (Atim 1999); Senegal (Jutting 2004); India (Ranson 2001, Bhat and Jain); and Phillipines (Dror et al 2005, 2006, 2007). While reviewing the empirical literature, Ekman (2004) finds that there is moderately strong evidence that health care utilization is higher in members than in non members. But he concludes that the analysis requires more rigorous treatment.

Recent attempts to adopt a more integrated approach on health and development have put the 'Health Impact Assessment' high on the agenda of governments and international organizations such as the World Bank. This has given a strong impetus to the use of highly comprehensive techniques to evaluate the potential effects of a health Programme. This is reflected in the emergence of literature based on *matching* techniques. A number of studies based on this method have originated in the World Bank (Chen et al. 2006; Trujullo et al 2006 and Gravira et al 2006 for Columbia, Gakidou et al 2005 for Mexico; Wagstaff et al. 2007, and Wagstaff and Yu 2006 for China; Wagstaff and Pradhan 2005, Wagstaff 2007, Sepheri et al 2006, and Wagstaff 2006 for Vietnam; Hou and Chou 2008 for Georgia). However, none of the studies has integrated the gender perspective. The present study therefore is a significant contribution to the literature.

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<sup>1</sup> Most Programmes are based on individual enrolment. There are family packages offered also but the

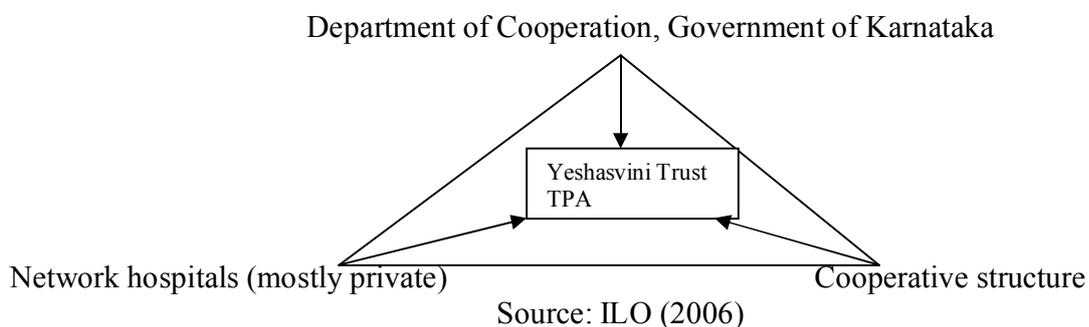
#### 4. The Yeshasvini Programme: An innovation in health insurance

The Programme was introduced in June 2003 in “Karnataka”. This is a CBHI in the strictest sense of the term. Several studies have described the characteristics of the Programme. These include, Kuruvilla (2004), Radermacher et al (2005), IDPAD (2005), and ILO (2006). In what follows, I have focused on the core characteristics of the Programme.

##### *Institutional Characteristics*

Yeshasvini is a unique example of tri-sector partnership. It is a cooperative venture between the public, private and cooperative sectors. It involves an independent governing body: The Yeshasvini Trust, which is assisted by a ‘Third Party Administrator’: Family Health Plan Limited (FHPL) as the executive organ.

**Figure 2 : Institutional structure of the Yeshasvini health insurance Programme**



The Programme operates in the cooperative sector to take advantage of the societal capital generated by a vast network of Cooperative Societies in Karnataka which connects diverse rural farmers and rural peasants. The Department of Co-operation mobilises membership and collects revenue through its administrative network. On the supply side, private sector hospitals are convinced to join the Programme as service providers. Initially only 30-40 hospitals agreed but the number grew rapidly as the Programme commenced. Some of the government run and charitable hospitals are also part of the network. Thus, the Programme has become a unique example of partnership between the public, private and cooperative sectors and is based on the

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enrolment is on individual basis

expertise of each partner that best meets public needs of health insurance through the appropriate allocation of responsibilities.

### *Organisational characteristics*

Yeshasvini is a self-funded Programme and is not linked to any insurance company. The Programme is governed by a charitable trust: “Yeshasvini Cooperative Farmers’ Health Care Trust”. The Trust is governed by a board of trustees. This board consists of 12 members and is chaired by the Principal Secretary of the Department for Cooperation. Other members are :

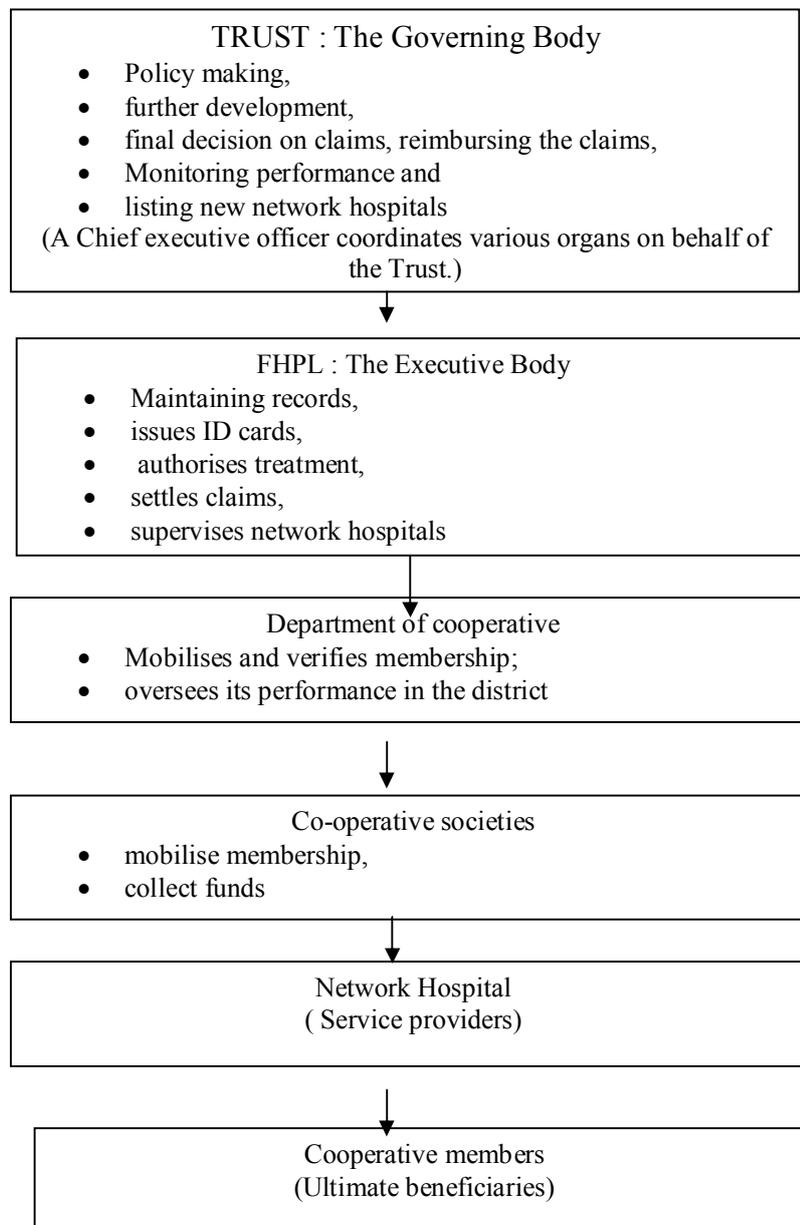
- five employees of the Karnataka Department of Cooperation;
- five well-known health professionals representing network hospitals; and
- Director of the Health Department<sup>2</sup>.

It has out-sourced the administration of the Programme to a Third Party Administrator (TPA), a profit-oriented subsidiary of Apollo Hospital: “Family Health Plan Limited”. The TPA has 26 coordinators across 27 districts, who help in the implementation of the Programme at the district level. The Department of Cooperation mobilises membership and collects premiums with the help of cooperative societies and extend help to members in seeking treatment from network hospitals. Finally, there are designated health care providers in the Programme. Spread throughout Karnataka, they are mainly private hospitals, although charitable, public sector and cooperative sector hospitals are also participating in the Programme. Some are super specialty hospitals. Currently, the number of network hospitals is 349. These are spread across 27 districts. These hospitals are subject to regular inspections and those hospitals that do not adhere to the rules are dropped out from time to time. Their number therefore keeps changing *albeit* marginally. Thus, the administrative structure is based on 6 pillars. Figure 3 describes the role of each of these organs.

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<sup>2</sup> Included as the 12<sup>th</sup> trustee in November 2005.

**Figure 3: The organisational structure of the Programme**



Source: Interviews with Yeshasvini CEO

## *Technical Design*

Targeting for membership mobilisation : The Department of Cooperation defines a membership target for each renewal period. The total target fixed for a given year is broken down to each district and the unions in the districts. It is communicated to Deputy Registrars, who, in turn use the administrative machinery and governing bodies of the cooperative societies to encourage and motivate people to become members.

Collection of premium : The financial year of the Programme is June 1 to 31<sup>st</sup> May. Primary cooperative societies start collecting the membership fee during the first five months of the years i.e. January to May and maintain lists of those who apply for new membership or renewals. In general, premium is fixed at the flat rate of Rs. 120 per person per year. The management reviews the premium rate from time to time and revises it if the need is felt

Issue of cards : FHPL issues an ID card with a photo to each subscriber.

Benefits : The Programme covers only surgical procedures, i.e. high cost low probability medical events. A list of 1600 procedures has been specified. Free OPD consultations and diagnostic lab tests at concessional rates are optional. Different hospitals follow different practices in this regard. During our interviews with network hospitals we found that some hospitals offer upto 50% discount on lab tests. The Programme does not cover in-patient admission without surgery. The benefits are reviewed from time to time and appropriate changes are introduced in the package depending on the demand. For instance, recently, non surgical events such as normal deliveries and emergencies such as snake bite, bull gore and dog bites are also included in the package. Medico-legal cases (such as assaults, rapes, and accidents) are however not covered under the Programme.

The Trust has fixed a price for each surgery, including nearly all connected costs. This is inclusive of admission charges, bed charges in a common ward, nursing charges, anaesthesia charges, O.T. charges, surgeon's charges, as well as the costs of consumables and medicines

during and after the operative period. A well specified list of exclusions is provided to all the hospitals.

An important feature of the Programme is that the price for surgery paid to a network hospital is significantly below the normal market charges to discourage unwarranted surgeries.

Enrolment process for network hospitals : A hospital willing to join the Network has to apply to the President of the District Cooperative Bank (DCB) if it has 25 or more beds. It is evaluated by the FHPL, which submits its report to the Trust. The Board of the Trust takes the final decision on the application. In case of a positive decision, an agreement is signed with the hospital.

The process of treatment for the beneficiary and claims settlement : An important feature of this Programme is that the transactions are cashless. The patient is not involved in any administrative process. He is not to pay any charges during surgery except if he would like to stay in the special ward. The patient does not need to handle money; the insurer pays the health care provider for pre-approved surgeries.

#### *Monitoring Mechanisms*

Monitoring of network hospitals : The FHPL undertakes regular inspection of network hospitals to check the quality and to ensure that they adhere to the commitments made to the Trust. If they are found defaulting, strict actions are taken against them including permanent ban on their Yeshasvini membership.

Weekly meetings : There is a Yeshasvini Cell at the office of the Registrar of Cooperative Societies. It holds weekly meetings to discuss operational issues.

District Coordination Committees : The Trust has established District Coordination Committees (DCCs) to assist in monitoring the Programme and the quality of care provided at the district level. A DCC is chaired by the District Cooperative Bank's President. The Committee plays a coordinating role during the subscription/renewal phase as well as in the preparation of the decision for new network hospitals. Its meetings are held periodically.

In nutshell, this is one of the most innovative Programmes in community health financing. Its innovativeness lies essentially in the fact that it has developed efficient partnership arrangements between the government, the private and the cooperative sector to exploit their respective strengths to deliver health to the targeted disadvantaged group. Mechanisms are developed to tap the government for its vast administrative machinery to mobilise members and monitor the Programme without creating additional administrative infrastructure; the private sector for quality health care services; and the cooperative sector networks for the societal capital generated over the years through business linkages between these societies and their members. Another innovative aspect of the Programme is that it covers highly catastrophic and less discretionary impatient surgical procedures. Despite low contributions, the synergy developed at various levels is directed to finance high cost medical treatment of the poor who otherwise have no health security provided by the State. The Programme has a well designed monitoring and regulatory mechanism in place which lends credibility to the Programme.

**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.

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. Table 1 shows that, 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 the State Cooperative Department exerts considerable efforts to achieve high levels of participation. On the benefit side, 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 Programme 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.

## **5. The Programme and patterns of female participation**

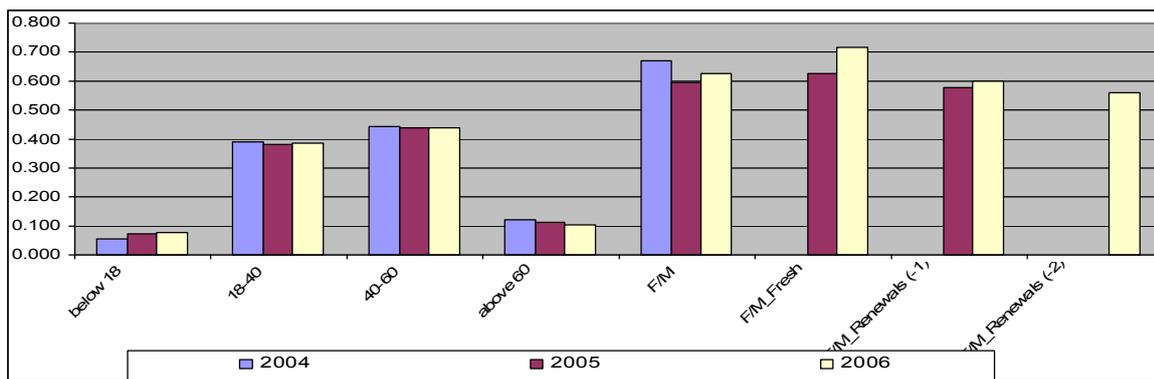
The FHPL maintains membership and beneficiaries' data by age, sex, society, and region. This data base was used to analyse the distribution of members and beneficiaries. In what follows, I have summarised the main findings.

### **5.1 Distribution of members by sex**

Figure 4 shows the distribution of members by age and sex for three years, namely, 2004-05, 2005-06 and 2006-07. It shows that the distribution of membership is highly skewed in the working age group of 18-60 years. Over 80 percent membership is accounted for by members in this age group. Measured in DALY's, almost 50 percent of total disease and injury burden falls on adults aged between 15 years to 59 years. Thus the Programme captures the groups which bear the highest disease burden. However children below 18 years of age form the smallest membership group accounting for less than 10 percent of membership. The female to male ratio among members is

also unfavourable as compared with that in the population. For every 1000 male members, there are less than 700 female members in Yeshasvini against 966 females per thousand males in the rural population in the State. Furthermore, DALY's disease burden involved 974 females per 1000 of males in 2004 in South East region (WHO 2004). Thus, females and children appear to be relatively under represented in the membership. Another interesting observation is that the female-male ratio is higher for fresh enrollees than that for renewals. The ratio declines as one moves back farther in time. For instance, in 2006-07, the female-male ratio was 716 for the fresh members. It was 599 for the 2005-06 renewals and 560 for the 2004-05 renewals. It could be that a larger proportion of females than males are subject to pre-existing illness and that after the treatment these females drop out.

**Figure 4: Distribution of members by age and sex**



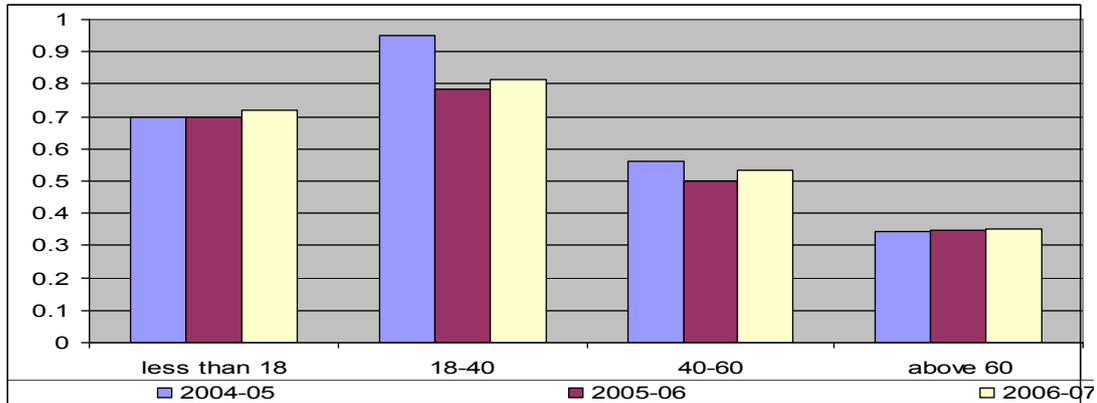
Source: based on FHPL data

Figure 5 depicts the female-male ratio by age group during the past three years. It shows that the ratio is highly favourable in the reproductive age group i.e. 18-40. It was as high as 955 in 2004-05. Thereafter it declined somewhat and settled at 810 per 1000 males in 2006-07. According to the World Health Organization, sexual and reproductive ill health accounts for one-third of the global burden of diseases among women of reproductive age (15-44 years old)<sup>3</sup>. Once females cross that age, their vulnerability to health problems is reduced. Males' vulnerability to health problems on the other hand, increases after crossing the age of 40. Apparently, the Programme is

<sup>3</sup> WHO. Estimates of DALYs by sex, cause and WHO mortality sub-region. Available at <http://www.who.int/whosis/en/>; accessed August 29, 2007.

not female insensitive. Rather, it encourages female participation in the vulnerable age group. Thus the Programme is likely to favourably affect the health care use amongst women.

**Figure 5: female to male ratio by age group : 2004-2007**

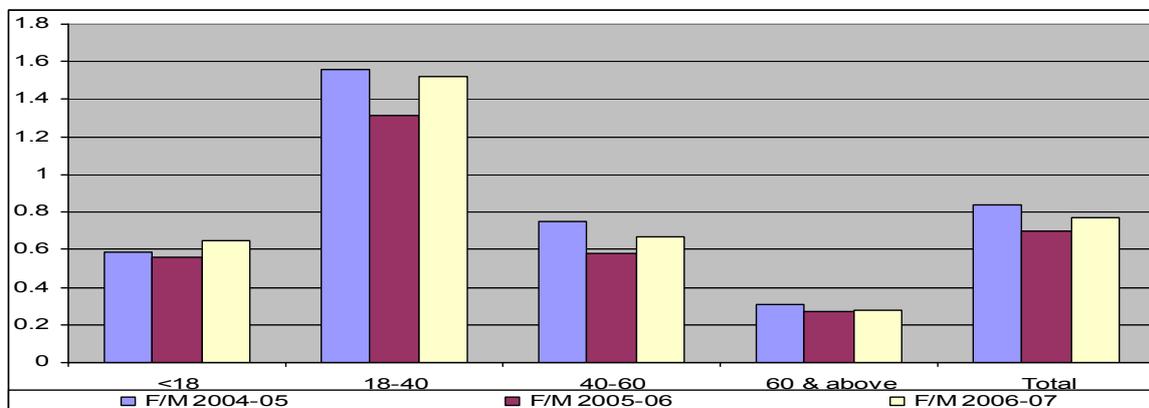


Source: based on FHPL data

## 5.2 Distribution of beneficiaries by sex

The average female to male ratio has been slightly higher among beneficiaries than that among members. In 2004-05, it was 835 per 1000 males among beneficiaries against 675 among the members (figure 6). It declined drastically in 2005-06 but then increased to 769 per 1000 males in 2006-07. The female share among beneficiaries was 45.5 percent in 2004-05 which declined somewhat to 43.6 percent in 2006-07. Amongst members, it was 42 percent in the same year.

**Figure 6: Distribution of beneficiaries: by female to male ratio**



Source: Based on FHPL data

What is however more important to note is that women outnumbered men in the age group of 18-40 resulting in the female ratio among beneficiaries which has been above 1.5. The female male ratio recorded in the age group of 40-60 is also relatively higher among beneficiaries as compared with that among members.

One can thus conclude that the female members are more likely to suffer from adverse selection than male members. This reflects inferior women's position in a household. They register as members generally when they are at high risk and drop out after the treatment. But this means that these females might not have received the treatment had the Programme not been in place. Thus the Programme appears to have had a gender positive effect. In what follows, we analyse using quantitative techniques, the impact of Yeshasvini on health care utilization among the rural women.

In what follows, we quantitatively analyse two aspects of female participation in the Programme

- female participation in the Programme at the household level, and
- its impact on primary health care utilisation by them.

## **6. Methodology**

### **6.1 Female participation in the Programme: Quantitative exploration at the household level**

We used Probit models to examine female participation in the Programme at the household level. While doing so we analysed the impact of the 'share of female members' in a household on the probability of that household becoming member and/ or beneficiary of the Programme. Thus our model is

$$Y^* = X'\beta + \varepsilon,$$

Where,  $Y^*$  is a binary variable and is associated with two alternative specifications.

- One, it takes value  
=1 if at least one member is Yeshasvini member;  
=0, otherwise.

- two, it takes value  
 = 1, if at least one member has received the benefits of the Programme in surgical treatment  
 =0, otherwise.

While the former specification yields information on the determinants of membership, in particular, on gender friendliness of the Programme. The latter is used to analyse the impact of the Programme on the use of the Programme among women.

**Table 2: Independent Variables**

<b>Households</b>	
Economic	H_I_Concentration : H index of the share of income-source in total income
	H_Perincome: per capita net income of the household
Education	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
Social	H_mem_shg :=1 if HH is member of SHG;=0 otherwise
	H_Sc_group:=1 if belongs to SC/ST
Demographic	Hsize: household size
	H_Secitizen: members with 60 years and above age
	H_female-share : 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	H_Dumchronic=1 if at least one member has chronic disease; =-0 otherwise
<b>Village</b>	
Economic	V_Livincdn: Index of living conditions ( PCA based)
	V_Naturalcdn: No. of beneficiaries of natural disaster as percentage of total population
Health	V-hlthinfra : Index of health facilities based on PCA
	V-hlthdistance: Duistance from the nearest health facility
	Y-dist : distance of the nearest Yeshasvini facility
Cooperative	V_copop : cooperative societies per capita
<b>District</b>	
Economic	D_PCY : per capita income
Health	D_healthinfra : Index of the quality of district level health infratructure
	D-tpt: PCA based index of district level transport facilities
Governance	D_panchayat : No. of panchayats adjusted by the number of villages
	D_f_m_gp : female membersin gram panchats as ratio of total members

Two separate regressions were performed for membership and beneficiaries. 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, few studies have analysed the female friendliness of these Programme. For analyzing gender sensitivity, we incorporated in the model, a variable, namely, female-share. The variable represents the share of female members in a household.

Furthermore, 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. Hit or miss method was adopted in the final selection of models.

## **6.2 Impact of the Programme membership on primary health care utilisation**

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 program participants. The problem is to find  $E(Y_0|P=1)$ . The solution advanced by Rubin (1977) is based on the assumption that given a set of observable covariates  $X$ , potential (non-treatment) outcomes are independent of the participation status. Hence, after adjusting for observable differences, the mean of the potential outcome is the same for  $P = 1$  and  $P = 0$ . This permits the use of matched non-participating households to measure how the group of participating households would have performed, had they not participated. This procedure assumes that after conditioning on a set of observable characteristics, outcomes are conditionally mean independent of the program participation. The most widely used type of matching is propensity score matching (Rosenbaum and Rubin 1983). Instead of conditioning on observable characteristics, it suggests conditioning on propensity scores. Thus the comparison group is matched to the treatment group by using the propensity score. Propensity scores should match closely. The closer the propensity score, the better the match. A member household's change in outcome is then compared with the counterfactual change in outcome, formed as the weighted average of changes in the outcome of non members where the weights reflect the propensity scores. Differences in the change are then averaged to get the average treatment effect.

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 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. Estimation of the propensity score function required two sets of

households: participants of the Programme and non participants (comparison group). Probit models were used for the estimation of propensity score functions.

### *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 loose 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.

### *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). The most intuitive matching method is the Nearest-Neighbour (or one-to-one) matching, which matches each treated observation to a control observation with the closest propensity score. In the case of the Nearest-Neighbour method, all treated units find a match. However, some of these matches may be fairly poor, because for some treated units the Nearest-Neighbour may have a very different propensity score. The Radius Matching and Kernel Matching methods offer a solution to this problem. This study makes 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 standard 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. This means treated households with propensity scores that are larger/smaller than the maximum/minimum propensity score observed in the untreated group are excluded.

### *Outcome Variables*

Health care utilization variables such as waiting period, consultations, OPD visits, incidence of hospitalisation are commonly used in the literature on health economics. However, few studies have analysed the impact of membership on the quality of facility used. This study has developed some measurable indicators of health utilization which capture both the use of health care services and the quality of health care services ( see, Table 3 for a list of variables).

**Table 3: Indicators of out patient and maternal health care utilisation for females**

<b>OPD</b>	
Op_sickdays	No. of sickdays reported during the past 6 months
Op_sicktime	No.of times sickness was reported during the past 6 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
Op_shr_bor	Share of borrowing in total treatment expenditure
Op_bor	Total borrowing due to treatment
<b>Maternal health</b>	
Mat_visit	No. of visit for check up before delivery
Mat_fac	Wtd.average of the facility visited, the highest weight given to Yeshasvini facility
Mat_shr_own	Share of own expenditure in total expenditure
Mat_caesarian	=1 for caesarian cases

### *Boot strapping of S.E.*

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 et al 1997). 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 Tobshirani 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.

## **7. 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 : primary 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 Department of Agriculture divides the State into 5 zones: 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 blocks on the basis of the number of households and from each block, 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 members of cooperative . 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 range of sources. Several departments of the government of Karnataka were approached for the information.

## **8 Empirical Results**

### **8.1 Female participation in the Programme**

#### *Determinants of membership and female participation*

Among the covariates, education status of the head of the family, prevalence of chronic disease in the family, social status and average earnings<sup>4</sup>, affect the probability of joining the Programme positively. These results are not unexpected as the descriptive statistics already indicate that Yeshasvini households belong to a relatively better off segment of the rural population. In the literature, there is overwhelming evidence that income,

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<sup>4</sup> Household wealth also turned out to be positive with a positive sign. However income and wealth are highly correlated and hence only one of them was included in the analysis.

**Table 4: Regression results explaining based on Probit Models**

variable	Members		Beneficiaries	
	Coefficient	z-statistics	Coefficient	z-statistics
<i>Household specific characteristics</i>				
H_dumchronic	0.1593951	3.99	0.174676	1.63
H_secitizen			-0.25524	-2.16
H_I_Concentration	-0.0000247	-2.05		
H_demodivage	0.0032549	3.31		
H_aveduyears			0.040911	1.81
H_headedustatus	0.1573907	8.38		
H_headage			0.021667	3.2
H_hsize	0.053669	5.94		
H_perincome	3.54E-06	1.94	0.026902	0.24
H_mem_shg	0.1108207	3.21	-0.08371	-0.85
h_sc_grp	-0.5435409	-9.47	-0.66442	-2.89
H_Female-share	-0.2129973	-1.62	0.772567	1.72
<i>Village specific characteristics</i>				
V_Yesh_dis			-0.00395	-1.67
v_hlthdistance			-0.18487	-1.8
v_hlthinfra	-0.0696038	-2.3	-0.05434	-0.76
v_livingcdn	-0.0000406	-0.84	-0.19047	-1.28
v_copop	18.29016	1.68	93.70244	2.43
v_naturalcdn	0.0363084	1.63		
<i>District specific characteristics</i>				
d_d_pcy7			2.92E-05	1.13
d_health_infras	-0.0178478	-1.9		
d_f_mem_gp			0.118179	2.2
d_tpt	-0.0102874	-0.4	0.063388	0.78
_cons	-0.9115836	-5.59	-3.12697	-2.6
LR	321			
Obs	3966		3459	

education and social status are important determinants of CBHI membership (Bhat and Jain 2006, Jakab and Krishnan 2001 among several others). Interestingly, those households who are members of ‘self help groups’ or ‘members of other health programmes’ are more likely to enroll with Yeshasvini also. Our key determinant “female-share” in the household just misses

significance at 10% with a negative sign. This indicates that the larger the share of women in a household, the smaller is the probability of its being Yeshasvini member. This indicates that the membership is skewed in favour of men. This supports our hypothesis and substantiates the membership patterns which indicate that the female male ratio is relatively lower among members as compared with that in the population.

Among village specific variables, natural conditions measured by beneficiaries of such calamities and, as expected, the density of cooperative societies emerge important. Cooperative societies play an important role in mobilizing membership at the village level. Therefore their presence within the village affects membership positively. At the district level, government run health facilities affect the Yeshasvini membership. The poorer the health infrastructure the greater is the probability of attracting households to Yeshasvini, indicating that the Programme is doing well in reaching the areas where government health facilities are poor. Thus becoming a Yeshasvini member is essentially a household decision which is largely influenced by the economic, social and behavioural factors of the households itself. Ecological variations in natural conditions, density of cooperative societies and health facilities also play a significant role in membership mobilisation. Several other village and district specific factors that we tested turned insignificant.

## **8.2 Impact of the Programme on primary health care utilisation among women**

### *Yeshasvini beneficiaries and female participation*

A Probit model explaining the probability of ‘being beneficiary’ is also presented in Table 2. It needs to be clarified that beneficiaries means the households where at least one member has received the benefit of Programme for surgical treatment over the past 4 years. Interestingly, income and wealth related factors turned insignificant in this equation. This means that there are no significant differences in the income levels of Yeshasvini beneficiaries and non beneficiaries. Apparently, while a well off household is more likely to become a member, a beneficiary is not necessarily economically better off than a non Y-beneficiary. Most studies while analysing

financial protection aspect of CBHI focus on membership and its relationship with income, and on finding a positive relationship between income and the probability of becoming a member conclude that the Programme does not reach the vulnerable. Our analysis also finds a positive relationship between income and the probability of enrolment. However, it reveals that benefits, which represent an outcome of membership, do not necessarily go to wealthier households. Interestingly, education also appears less significant in this model than in the enrolment model. The head's education status or his schooling years are not significant. Rather, the average education of the house holds emerges significant at 5 percent. Interestingly, our key variable, 'female-share' emerges significant with a positive sign. This variable is negative in the membership equation. A household with a larger share of female members is more likely to seek the benefits of the Programme. Clearly, the Programme has been benefiting the vulnerable sections of the society including the rural women. It is the not the membership that matters but the benefits.

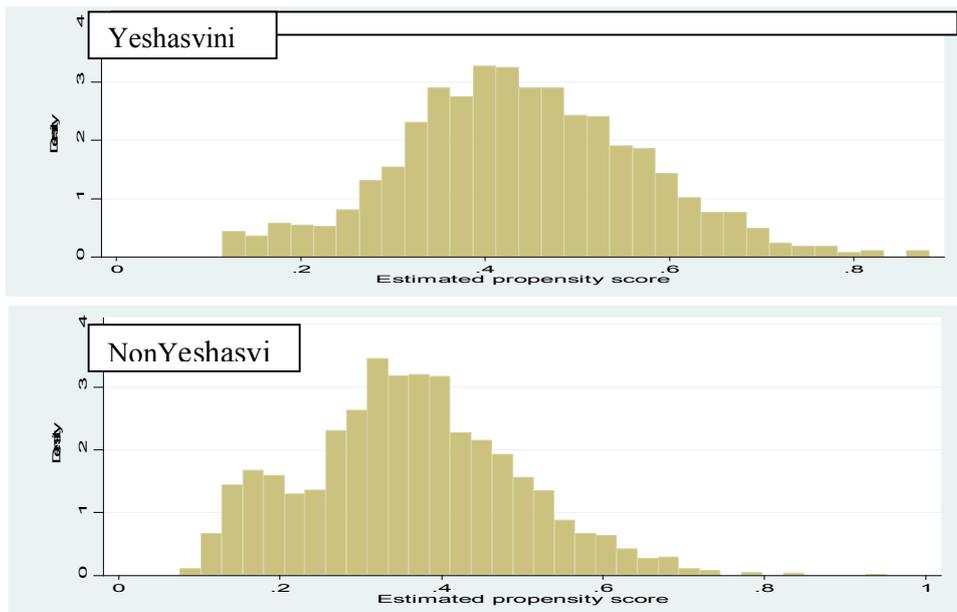
Variables representing village and district specific characteristics emerged more significant in this equation than in the enrolment equation. Transport facilities at the district level affect the probability of seeking benefits positively while the distance from the Yeshasvini facility affects it adversely. District health infrastructure is negatively related with the probability of seeking treatment at Yeshasvini hospitals while the presence of cooperative societies at the village level plays an important role. They can thus play an indirect role in encouraging membership. Interestingly, women's representation in gram panchayats has a positive impact on the probability of being beneficiary. If a household is situated in a district where women representatives in gram panchayats are relatively more, it is more likely to be a beneficiary of the Programme. This is an important finding which suggests that women empowerment is directly linked with health.

#### *Outpatient and maternal health care use*

In the first stage of using the propensity score matching, we modeled the probability of being a Yeshasvini member. Final results in propensity score matching methods depend on the quality of participation estimates. Omitting important variables will introduce bias in the results. We

therefore tested all household specific economic, behavioural and social variables along with variables capturing village and district specific characteristics, as well. The final probit estimation shows a relatively good fit of the model, expressed by Chi-squared statistics. The objective of these functions is to generate propensity scores. 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. 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 7 shows that in both the cases there is ample common support.

**Figure 7: Histogram of propensity scores : members vs non members**



The propensity score matching results are reported in Table 5 and 6. Our results indicate that there were differences in the average number of health care visits by women in insured and uninsured households. The number of consultations, sick-times and sick-days among women reported by insured households were higher for insured households than their uninsured counterparts in the control group. However these differences were not statistically significant.

We normalized the health care visits by the duration of sickness to analyse the intensity of health care use and performed the same test.

**Table 5: Differences in health case utilisation indicators based on Propensity score matching Kernel method : Full sample**

Indicator	Untreated	Treated	ATT	Bootstrapped S.E.	Z-statistics
Op_sickdays_hh	1103	705	0.0731	0.0608	1.2
Op_sick_time	1103	705	0.0234	0.0184	1.27
Op_wait_sicktime	1102	705	0.08181389	0.1025661	0.8
OP_consulted	1102	705	.035315	.02487	<b>1.42</b>
Op_consultdays	1102	705	0.0062763	0.0093062	0.67
Mat_visit	260	175	0.0374893	0.0527909	0.71
Mat_caesar	2445	1489	-0.0004	0.0047307	-0.08
<b>Op_shr_govt</b>	<b>1089</b>	<b>693</b>	<b>-0.095253</b>	<b>0.0243678</b>	<b>-3.91</b>
<b>op_pvt_shr</b>	<b>1089</b>	<b>693</b>	<b>0.0845685</b>	<b>0.0227835</b>	<b>3.71</b>
<b>Op_yesh_shr</b>	<b>1089</b>	<b>693</b>	<b>0.0137268</b>	<b>0.0047976</b>	<b>2.86</b>
op_av_money	896	576	33.50006	54.16881	0.62
<b>Mat_fac</b>	<b>1397</b>	<b>1489</b>	<b>0.0428362</b>	<b>0.0103198</b>	<b>4.15</b>
<b>op_shr_own</b>	<b>1019</b>	<b>648</b>	<b>0.06622</b>	<b>0.0282</b>	<b>2.35</b>
<b>op_shr_bor</b>	<b>1019</b>	<b>648</b>	<b>-0.0222</b>	<b>0.0119</b>	<b>-1.85</b>
<b>Mat_shr_own</b>	<b>13</b>	<b>33</b>	<b>0.1134</b>	<b>0.0749</b>	<b>1.51</b>

Bold letters means statistically significant

This signifies intensity of health care. It missed significance. Contrary to the expectations, the waiting time before the first appointment with a doctor also did not appear to have been affected by insurance. The differential effect on pre delivery visits to health facilities between insured and non-insured groups was insignificant. 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.

While the use of health care facilities was not affected by the membership, the quality of medical facility used did undergo significant changes for the members. Our results indicate that there has been a significant difference in the quality of the health facility used between the insured and uninsured households. The use of Yeshasvini and private facilities is significantly higher among insured households than uninsured households. The use of government facilities on the other hand is significantly smaller for the former than the latter. Clearly, there is a substitution effect in favour of better health care facilities. Insured households show preference for private and Yeshasvini facilities even for the delivery cases. It may be observed that the incidence of caesarian deliveries is in fact lower among insured households though not significantly so. 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.

Another important finding is that the treatment does not result into borrowings. Both *Op\_shr\_own* and *Mat\_shr\_own* emerge significant with positive signs. On the other hand *Op\_shr\_bor* is significant with a negative sign. Furthermore, the average money spent on treatment is not higher for the insured households. Apparently, the poor is able to bear the cost of treatment in better facility without resorting to debt. Thus the purchase of health care does not seem to have poverty enhancing effects.

Table 6 presents a comparative analysis between insured and uninsured households in a sample of cooperative households. The results in respect of the use of health care utilisation and quality of health facility used are not different. However, what needs to be observed is that the impact of Yeshasvini membership on financial protection becomes insignificant. This could be because cooperative members enjoy a higher economic and social status than non cooperatives and therefore are in a position to pay for non surgical non inpatient medical expenses without

resorting to borrowings. The impact of Yeshasvini membership thus is further marginalized. However, it still remains important in ensuring the access of the rural poor to quality health facilities.

**Table 6: Differences in health case utilisation indicators based on Propensity score matching Kernel method: Sample of cooperative members**

Indicator	Untreated	Treated	ATT	Bootstrapped S.E.	Z-statistics
Op_sickdays_hh	600	681	0.00242	0.062466	0.04
Op_sick_time	600	681	-0.00299	0.017584	-0.17
Op_consult	600	681	0.0292	0.02487	1.18
Op_consultdays	600	681	0.008416	0.010836	0.78
Op_shr_govt	593	669	-0.04698	0.026485	-1.77
Op_wait_sickti	600	681	0.159387	0.085382	1.87
Op_pvt_shr	593	669	0.040947	0.029851	1.37
Op_yesh_shr	593	669	0.014957	0.005566	2.69
Op_av_money	480	549	57.12158	82.08137	0.7
Mat_visit	148	165	0.057371	0.067118	0.85
Mat_fac	148	165	0.027916	0.012055	2.32
Op_shr_own	558	619	0.03797	0.027741	1.37
Op_shr_bor	558	619	-0.00523	0.014256	-0.37
Mat_shr_own	37	29	-0.00916	0.062188	-0.15
Mat_caesar	154	167	-0.00252	0.007517	-0.34

## 9. Conclusion

This article examines evidence on the impact of being insured by the Yeshasvini community health financing in India on healthcare utilization and financial protection, using appropriate statistical tools. It reveals that the Programme made highly sophisticated surgical treatments affordable for the poor women who are often discriminated against in the distribution of household resources. Even while they are out numbered by men in the membership of the Programme, they emerge as major beneficiaries of the Programme in particular in the vulnerable age groups. To that extent the Programme is found to be successful. The Programme does not appear to have made an appreciable impact on primary health care utilisation among women. However, it does result into a shift of preference from the use of government facilities to private facilities. Furthermore, there is strong evidence that community-based health insurance provides financial protection by reducing borrowings associated with medical treatment. The Programme

thus appears to be successful in extending the poor the benefits in medical emergencies It is therefore suggested that the membership to the Programme 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 be used to take a leap forward in the direction of implementing social insurance for the 'so called' unorganized sector in the rural areas which in reality is organised through the cooperative network. This would also help in creating large pool of resources and offering better package of services. The Programme has been successful and needs to be carried to the next level.

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