HNP DISCUSSION PAPER

The Impact of SEWA's Medical Insurance Fund on Hospital Utilization and Expenditure

A Household Survey

M. Kent Ranson

September 2001

HNP
HEALTH, NUTRITION, AND POPULATION
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Health, Nutrition and Population Discussion Paper

The Impact of SEWA's Medical Insurance Fund on Hospital Utilization and Expenditure: *Results of a Household Survey*

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Paper prepared as part of Ph.D. research. Dissertation submitted to the Health Policy Unit, London School of Hygiene and Tropical Medicine, London, United Kingdom, February 2002

Abstract: This paper assesses the impact of the Self-Employed Women's Association's (SEWA's) Medical Insurance Fund, Gujarat, in terms of inclusion of the poor, hospital utilization, and expenditure. Age-matched insured and uninsured women were compared using survey data (2000). We found that wealth was not a determinant of membership in the Fund; i.e., the poor were not excluded. Of 28 hospitalizations among Fund members over one year, only five were reimbursed. Membership in SEWA was not significantly associated with increased frequency of hospitalization, but there was a significant association with lower costs of hospitalization, net of reimbursement. Unlike many other CBHI schemes, the Fund has overcome barriers that exclude the poorest. This is due in part to nesting of the Fund within a larger development organization. Utilization of the Fund, and thus impact on hospital utilization and expenditure, was minimal. This may relate to a lack of awareness of benefits among Fund members, or costs and difficulties associated with submitting an insurance claim.

Keywords: health care surveys, health expenditures, health insurance, India

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PREFACE

In January 2000, Dr. Gro Harlem Bruntland, Director General of the World Health Organization (WHO), established a Commission on Macroeconomics and Health (CMH) to provide evidence about the importance of health to economic development and poverty alleviation.

This HNP Discussion Paper is based on a Report on community financing submitted in September 2001 to Working Group 3 of the CMH. The mandate of Working Group 3 was to examine alternative approaches to domestic resources mobilization, risk protection against the cost of illness and resource allocation. The working group was chaired by Professor Alan Tait (Former Deputy Director of Fiscal Affairs, International Monetary Fund, and currently Honorary Fellow at University of Kent at Canterbury and Honorary Fellow at Trinity College, Dublin) and Professor Kwesi Botchewey (Director of Africa Research and Programs at the Harvard Center for International Development).

Professor Jeffery D. Sachs (Chairman of the Commission and Director of the Harvard Center for International Development) presented the findings of the CMH in a Report that was submitted to WHO on December 20 2001—*Macroeconomics and Health: Investing in Health for Economic Development*.

The report of the CMH recommended a six-pronged approach to domestic resource mobilization at low-income levels: *"(a) increased mobilization of general tax revenues for health, on the order of 1 percent of GNP by 2007 and 2 percent of GNP by 2015; (b) increased donor support to finance the provision of public goods and to ensure access for the poor to essential health services; (c) conversion of current out-of-pocket expenditure into prepayment schemes, including community financing programs supported by public funding, where feasible; (d) a deepening of the HIPC (Highly Indebted Poor Countries) initiative, in country coverage and in the extent of debt relief (with support form the bilateral donor community); (e) effort to address existing inefficiencies in the way in which government resources are presently allocated and used in the health sector; and (f) reallocating public outlays more generally from unproductive expenditure and subsidies to social-sector programs focused on the poor*."

Most community financing schemes have evolved in the context of severe economic constraints, political instability, and lack of good governance. Usually government taxation capacity is weak, formal mechanisms of social protection for vulnerable populations absent, and government oversight of the informal health sector lacking. In this context of extreme public sector failure, community involvement in the financing of health care provides a critical albeit insufficient first step in the long march toward improved access to health care by the poor and social protection against the cost of illness.

The CMH stressed that community financing schemes are no panacea for the problems that low-income countries face in resource mobilization. They should be regarded as a complement to—not as a substitute for—strong government involvement in health care financing and risk management related to the cost of illness.

Based on an extensive survey of the literature, the main strengths of community financing schemes are the degree of outreach penetration achieved through community participation, their contribution to financial protection against illness, and increase in access to health care by low-income rural and informal sector workers. Their main weaknesses are the low volume of revenues that can be mobilized from poor communities, the frequent exclusion of the very poorest from participation in such schemes without some form of subsidy, the small size of the risk pool, the limited management capacity that exists in rural and low-income contexts, and their isolation from the more comprehensive benefits that are often available through more formal health financing mechanisms and provider networks.

The work by the CMH proposed concrete public policy measures that governments can introduce to strengthen and improve the effectiveness of community involvement in health care financing. This includes: (a) increased and well targeted subsidies to pay for the premiums of low income populations; (b) use of insurance to protect against expenditure fluctuations and use of re-insurance to enlarge the effective size of small risk pools; (c) use of effective prevention and case management techniques to limit expenditure fluctuations; (d) technical support to strengthen the management capacity of local schemes; and (e) establishment and strengthening of links with the formal financing and provider networks.

The report presented in this *HNP Discussion Paper* has made a valuable contribution to our understanding of some of the strengths, weaknesses, and policy options for securing better access for the poor to health care and financial protection against the impoverishing effects of illness, especially for rural and informal sector workers in low-income countries.

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I. INTRODUCTION

Community-based health insurance (CBHI) schemes—also referred to as micro-insurance units and mutual health insurance—are mechanisms wherein people prepay for some component of health care and there is some pooling of revenues and risks such that the healthy cross-subsidies health-care for the sick. Policy makers generally see CBHI as a means of improving access to effective health care, particularly among the poor, and preventing indebtedness and impoverishment as a result of trying to access such care (WHO 2000).

Few studies have investigated the impact of CBHI schemes in developing countries. In general, these studies suggest that it is difficult to include the poorest individuals and households in a CBHI scheme, but that a well designed and managed scheme can increase demand for, and utilization of health care, while protecting members from catastrophic costs.

There are many reasons the poorest in a population might not join a community-based health insurance (CBHI) scheme, including: lack of information about the scheme, lack of solidarity within the population, limited participation in planning or managing the scheme, unaffordable premiums, and priorities that are more important or immediate than health and medical insurance (e.g., food and shelter). In their review of 83 health insurance schemes for the informal sector, Bennett et al. (1998) found that most schemes relied on flat-rate premiums, and that for several schemes unaffordable premiums were a major deterrent to participation. For example, a study conducted in rural Senegal found the average income of members of 4 CBHI schemes to be three times as high as randomly selected nonmembers; the authors attributed this difference to premiums that were unaffordable to the poorer part of the population (Jütting 2001). Despite problems of affordability, very few schemes have adopted sliding scales or exemptions for people who could not afford to pay (Bennett et al. 1998).

Numerous studies have found CBHI schemes to increase utilization while (or as a result of) decreasing costs to the consumer. Schemes that cover hospital inpatient care have resulted in increased rates of utilization in such diverse settings as: China (Bogg et al.1996), Democratic Republic of Congo (Criel and Kegels 1997), Ghana (Atim 1999), and Kenya (Musau 1999). In Bwamanda district, Democratic Republic of Congo, Criel and Kegels (1997) found that rates of hospital utilization by members of a voluntary insurance scheme for hospital care were twice as high as for the uninsured (49 versus 24.9 per thousand per year). The Nkoranza Community Financing Scheme in Ghana (Atim 1999) covers 100 percent of the costs of hospitalization. Members of the scheme were consistently more likely to be admitted to hospital (4.6 to 6.3 percent admitted per year) than nonmembers (1.5 to 2.6 percent per year). We make the assumption in this study that increasing utilization rates among the poor in developing countries is a "good thing," at least from the perspective of scheme members. However, the inefficient overutilization of services *(moral hazard)* and the escalation of costs borne by the insurer or provider have been problematic, particularly in schemes that cover hospital inpatient care (Bennett et al. 1998).

The Self-Employed Women's Association's (SEWA's) Integrated Social Security Scheme was initiated in 1992. This scheme provides life insurance, medical insurance, and asset insurance. Those who pay the annual Social Security Scheme premium of 72.5 rupees—30 rupees of which is earmarked for the Medical Insurance Fund (herein referred to as the Fund)—are covered to a maximum of 1,200 rupees yearly in case of hospitalization in any registered (private or public) facility. Only women between the ages of 18 and 58 are eligible for membership in the Fund. Women also have the option of becoming lifetime members of the Social Security Scheme by making a fixed deposit of 700 rupees. Interest on this is used to pay the annual premium, and the deposit is returned to the woman when she is 58 years old. Upon discharge from hospital, members must first pay for the hospitalization out of pocket. They submit receipts and doctors' certificates to the Fund, and if the insurance claim is approved, they are reimbursed

by check. Excluded from coverage under the Fund are certain chronic diseases (e.g., chronic tuberculosis, certain cancers, diabetes, hypertension, piles) and "disease caused by addiction" (SEWA brochures 2000). Throughout the 10 districts of Gujarat where it operates, the Fund had approximately 23,000 members in 1999-2000. This compares with roughly 150,000 women who are covered under the broader SEWA trade union, statewide.

The purpose of this paper is to assess the impact of the Fund. The data for this analysis were collected from households in Anand and Kheda Districts using an interview-administered questionnaire. We will look at impact in terms of: (1) population reach of the Fund, particularly inclusion of the poor; (2) hospital utilization during the one-year period preceding the survey; and (3) annual cost of hospitalizations, conditional on reporting one or more hospitalizations.

We hypothesize that the Fund will:

- Include the very poor. The broader SEWA trade union organizes poor women working in the informal sector and seems to target quite effectively. By restricting membership in the Social Security Scheme (and hence the Fund) to members of SEWA trade union, the Fund is likely to include women who are, on average, poorer than the general population.

- Increase the frequency of hospitalization among the insured, by removing some component (i.e., maximum of 1,200 rupees) of the financial barrier to seeking inpatient care. Note that impact on utilization is likely to be lessened by the fact that women must first pay out-of-pocket—which often means borrowing money, selling valuables, or performing extra work—before seeking reimbursement from SEWA.

- Decrease the total annual hospital costs per person hospitalized. This basically assumes that: among insured women, some hospitalizations will be caused by conditions that are covered by the Fund; women will actually seek reimbursement when they have been hospitalized for a covered condition; and, the Fund will reimburse women for some portion of the claims that are submitted.

II. METHODS

A. DATA COLLECTION AND ANALYSIS

This was a cross-sectional cohort study; respondents were interviewed at only one point in time, and we fixed in advance the number of SEWA and uninsured households (the two "cohorts"). Two-stage, random cluster sampling was used. The primary sampling units (PSUs) were villages. Twenty villages were selected randomly (using random-number tables); the probability of selection was equal for all villages regardless of size. The secondary sampling units were households. Within each village, insured were randomly selected from lists compiled by SEWA and uninsured were randomly selected from census or voting lists. In 10 villages, 14 SEWA households and 14 uninsured households were sampled, and in 10 villages 14 SEWA households and 28 uninsured households were sampled (20 villages x 14 SEWA households = 280 SEWA households; 10 villages x 14 controls + 10 villages x 28 controls = 420 controls; therefore *700 households* are included in this analysis)[1]. The household questionnaire was

[1] Note that this study was actually designed to look at *two* community-based insurance schemes, SEWA and the Trivbhuvandas Foundation, and a total of 1,120 households were actually interviewed. However, TF households and their controls are not included in this analysis.

administered between 14 February 2000 and 6 May 2000. An attempt was made to interview the female head of household.

Data were double-entered into a Microsoft Access Database. Analysis was conducted using Stata. Special statistical tools (the "svy function" in Stata) have been used to correct for clustering and stratification. This means that all measures of central tendency, association and variance have been weighted/adjusted to account for the different probability of a household's being selected in each of the primary sampling units.

The survey estimators are based on maximum likelihood estimation. We present adjusted Wald tests for all models; this is equivalent to the F-test of the significance of the regression. A p-value of 5 percent or less was used as criterion for significant association.

The analyses in this paper are restricted to women of ages 18 to 58 years, as only they are eligible for participation in the SEWA's Medical Insurance Fund.

B. MODELS

(1) What was the population reach of the Fund?

The model for looking at sociodemographic determinants of membership is a *logit model*, written as follows:

$$\ln(p/(1-p)) = X\beta + \varepsilon \qquad \textbf{(Equation 1)}$$

where p is the probability of being a member in the Fund, given female gender and age 18 to 58 years, and X represents a set of independent variables that are hypothesized to affect membership in community based schemes.

(2) Did the Fund impact on hospital utilization over the last one year?

The model is a *logit model*. It estimates the probability of an individual being hospitalized during the one-year period preceding the interview. It can be written as follows:

$$\ln(p/(1-p)) = X\beta + \varepsilon \qquad \textbf{(Equation 2)}$$

where p is the probability of hospitalization, given female gender and age 18 to 58 years, and X represents a set of independent variables that are hypothesized to affect individual patterns of hospital utilization.

(3) Did the Fund impact on net annual hospital costs per person hospitalized?

The model is a log-linear model that estimates the net costs incurred for all hospitalizations (over one year), conditioned on positive hospitalization. Costs were net of reimbursement by insurance schemes, including the Fund. The model can be written:

$$\ln Y = X\beta + \varepsilon \qquad \textbf{(Equation 3)}$$

where Y is the net annual hospital costs per person, given female gender, age 18 to 58 years, and one or more hospitalization over one year, and X represents a set of independent variables that are hypothesized to affect individual patterns of hospital expenditure.[2]

Equations 2 and 3 are equivalent to the "two-part" (utilization and expenditure) model developed as part of the Rand Health Insurance Experiment and used more recently by Yip and Berman (2001) in their study of the impact of Egypt's School Health Insurance Programme.

C. DEPENDENT VARIABLES

Table 1 describes the independent variables included in the analyses. We include a number of household-level demand side factors. Independent of insurance, wealth is hypothesized to be positively associated with rates of hospitalization and with net costs of hospitalization. As a proxy for wealth, we construct an economic status index (ESI) based on household assets, allowing the weights of these assets to be determined by the statistical procedure of principal components (Filmer and Prichett 2001). The other household-level variables controlled for are religion, caste, and number of people living in the household.

A number of individual-level, demand-side variables are controlled for. In all models, we control for age, literacy, marital status, and primary occupation. For models 2 and 3, individuals are classified as SEWA insured, uninsured but living in a household with at least one other insured person, and uninsured and not living with someone who is insured by SEWA. It was not uncommon for some adult women in a household to join the scheme while others abstained. We hypothesize that uninsured women living in the same households may also have increased rates of utilization, due to the information and education provided by SEWA, and due to the positive wealth effect of having insured people in the household. In model 1, we control for the number of acute illness episodes reported during the last 30 days as a proxy for general level of health (unfortunately, we did not collect information on whether or not individuals had chronic disease(s)). We hypothesize that those in poorer health are more likely to join the Fund.

In model 3 only, we control for characteristics of the hospitalization. We hypothesize that use of private-for-profit and private-nonprofit hospitals (generally perceived to be of higher quality) will be associated with higher net costs of hospitalization than use of government facilities. Women who report longer episodes of hospitalization are expected to have experienced higher net costs. Finally, we anticipate that women hospitalized for pregnancy, delivery, and family planning will generally have experienced an uncomplicated hospitalization without major surgical procedures, and for this reason will have lower net costs.

III. RESULTS

In total 242 SEWA households and 381 control households were included in the analyses (some households were dropped from the analyses due to misclassification). In the 242 SEWA households, there were 270 members and 125 women 18 to 58 years of age who were nonmembers. In the 381 control households, there were 607 women 18 to 58 years of age.

[2] In the log-linear model, the coefficient β for a *continuous* independent variable gives the relative change in the mean value of Y for a unit change in X. To obtain the relative change in mean Y for a *dummy variable*, one must take the antilog (to base e) of the estimated dummy coefficient and subtract it from 1 (Gujarati 1995, p. 525).

The demographic data (before controlling for any potential confounders) suggest that the SEWA-insured were of lower socioeconomic status than the uninsured in control households (*Table 2*). They ranked lower on the Economic Status Index. They were almost twice as likely as the uninsured to be of a "backward caste" and tended to be from smaller households. They were older (mean 40.1 versus 35.0 years), less likely to be literate, more likely to report primary occupation as unskilled labor for daily wages, and almost 60 percent more likely to have reported illness within the last 30 days (our proxy for frequency of chronic disease).

In the SEWA households interviewed, more than two thirds of women 18 to 58 years of age were enrolled in the Fund (*Table 2*). The SEWA-insured, in comparison to the uninsured living with SEWA members, were older (mean 40.1 versus 26.3 years), less likely to be literate, more than twice as likely to report that primary occupation was unskilled labor for daily wages, and more than four times as likely to have reported illness within the last 30 days.

Among the SEWA-insured who experienced hospitalizations during the one-year recall period, the frequency of reimbursement by SEWA was low. There were 28 hospitalizations among Fund members, and *only 5* of these hospitalizations (18 percent) were reimbursed by SEWA. For the five members who were reimbursed, the costs before reimbursement were 4,431 rupees and after reimbursement 3,434 rupees.

Before controlling for sociodemographic variables, SEWA-insured were 1.5 times more likely than uninsured women in control households to have been hospitalized (0.095 versus 0.063; *Table 3*). Among those hospitalized, the net annual hospital costs for the SEWA-insured were less than half those of the uninsured women in control households. (Clearly, this difference cannot be attributed to the Fund, given that even among the very few people reimbursed, the mean reimbursement amounted to less than one-quarter.)

A. Regression Analyses

Controlling for other sociodemographic variables, only older age and higher frequency of illness episodes within the last month were significantly associated with membership in the Fund (*Table 4*). Results were the same for the "full" and "best fit" models. Wealth, proxied by quintiles of ESI, was not significantly associated with membership in the Fund; there was a trend suggestive of higher levels of membership among the second and third income quintiles (compared with the first, or poorest, quintile), but this did not reach significance at the 95 percent level. Women of ages 30 years and above were 3.4 times as likely to join the Fund as those of 18 to 20 years (full model). Each additional illness reported within the last month (acute illnesses as well as exacerbations of chronic disease) was associated with a 70 percent (full model) to 80 percent (best fit) increase in the probability of joining the Fund.

Neither membership in the Fund nor any of the sociodemographic variables tested were significantly associated with the probability of having been hospitalized (*Table 5*). Again, results were similar for the full and best fitting models. There was a trend suggestive of higher rates of hospitalization among Fund members (and even women living in the same households as Fund members) but this association was not significant. There were also trends toward lower frequency of hospitalization among higher ESI quintiles, and lower frequency of hospitalization with increasing age, but again these were not significant at the 95 percent level.

Results of the model of annual hospital costs per person hospitalized varied somewhat with changes in the variables included and the removal of outliers (*Table 6*). In some models, hospital expenditures were significantly lower among the SEWA insured (Models 3B, 3C and 3D). Interestingly, this finding *was*

not sensitive to removal from the model of the five cases of hospitalization that were reimbursed; in model 3D, being insured by SEWA was associated with a decrease in hospital expenditures of 54 percent (β = -0.789) even though the five reimbursed hospitalizations were removed from the calculations. Consistent in the various iterations of Model 3 were the findings that hospital expenditures: varied directly (and significantly) with quintiles of ESI; were significantly higher for private than for public hospitalizations; and were significantly lower for pregnancy, delivery, or family planning than for other causes.

IV. DISCUSSION

A. STRENGTHS AND LIMITATIONS OF THE STUDY

Perhaps the greatest limitation of this study was its small sample size. The study shows trends toward higher rates of utilization and lower spending per episode of hospitalization among SEWA members (significant in some models). Had the study been larger, these associations might have been statistically significant (or in the case of spending, consistently statistically significant). Insufficient sample size arose in part because there were fewer Fund members in "insured" households than had been expected, and because of the problem of misclassification of households, i.e., households were identified as including a Fund member, when in fact they did not. Such households were dropped from the analysis without replacement.

It is difficult to say how accurately the Economic Status Index (ESI) reflected household "wealth." A very similar index developed for Indian survey data (Filmer and Pritchett 2001) was closely correlated with State Domestic Product (SDP) and poverty rates data. Using data from Indonesia, Pakistan, and Nepal, they also showed their asset index to be consistent with consumption expenditures. Comparison of our asset index with the interviewers' assessments of wealth and with daily household expenditures on food suggested strong correlation (data not presented here). Nonetheless, it is possible that some of the "negative results" in this study were due to insufficiently controlling for wealth. For example, if, as hypothesized, SEWA membership was inversely associated with wealth, and wealth was directly associated with hospital spending, then failure to fully control for wealth could result in an observed estimate of effect that is diluted toward the null. Though not presented in this paper, all of the models were run using two other indicators of wealth (interviewers' assessments and daily per capita food consumption) with no major changes in the results.

Several questions were not included in the household questionnaire that, in retrospect, should have been included. For example, it is common in such analyses to control for the presence of "chronic diseases," but these data were not available from our questionnaire. It would have been both interesting and informative to know, among the SEWA-insured women who had undergone hospitalization, the number who had submitted claims but were still awaiting a response or had been unsuccessful in their claim. Finally, for purposes of triangulation (i.e., verifying the ESI), we could have collected data on household expenditures on a small number of items, as a proxy for total household expenditures (Morris et al. 2000).

It is possible, though unlikely, that observation bias impacted on the study results. Interviewer bias may have occurred if investigators elicited or interpreted information differently among the insured and the uninsured. It was impossible to blind interviewers to the insurance status of the household. Certainly the interviewers did come to make generalizations about households, for example, that SEWA households tended to be very poor. Thus, there may have been some bias in the way they recorded household asset information. It is also possible that the interviewers probed more carefully into health care seeking and

spending among poorer households. Study subjects may also have reported events in a non-comparable manner (recall bias). For example, SEWA members may be more likely to recall episodes of hospitalization or to remember how much they have paid for hospitalization, as they have been sensitized to the subject by the information, education, and communication from SEWA (or they have spent months collecting and processing the related paperwork). Perhaps the lower hospital expenditures reported by the SEWA insured is a function of more accurate recall (i.e., a lower probability of accidentally inflating the figures).

Unlike many other CBHI schemes, SEWA has not excluded the very poor. What design factors have facilitated inclusion of the poor in the SEWA scheme? The fact that the SEWA Integrated Social Security Scheme is nested within the larger development organization (the SEWA workers union) has undoubtedly been an important factor. Bennett et al. (1998, p. 20) hypothesize that, "communities may be more willing to participate actively in health insurance schemes (initiated by NGOs involved in broad community development activities) since they consider that their priority needs—for a stable income, for instance—are also being addressed." Other factors that are likely to have facilitated inclusion of the poor include: an affordable premium; village-level representatives who are themselves poor, self-employed women; and efforts to serve geographically isolated villages.

The positive associations between older age and higher frequency of illness and membership in SEWA's insurance scheme suggest that adverse selection may be occurring. Bennett et al. (1998), in their review of community-based health insurance schemes, found that adverse selection affected schemes that cover hospital inpatient care, in particular. The fact that membership in the SEWA scheme is voluntary and individual may enable adverse selection. However, the waiting period after joining and the exclusion of preexisting or chronic diseases are meant to limit adverse selection. It is likely that adverse selection is to some extent encouraged by scheme functionaries, insofar as poor households with limited expendable income may be encouraged to insure the household member who is most likely to fall ill. Furthermore, the scheme does fall somewhere on the spectrum between health-insurer (strictly-defined) and "social service" in that the scheme does aim to improve access to hospital care among the poor and to protect the poor from the costs of hospitalization. As such, adverse selection may be viewed in a positive light. If it is decided to try to deter adverse selection under the scheme, additional methods that could be used include: (1) making the household, or even the village, the unit of membership and enforcing this rule strictly; (2) stipulating that if a village is to be allowed to enter a scheme a certain proportion of households in the village must join; and (3) making the scheme compulsory (Bennett et al. 1998, p. 56).

We found no significant association between membership in SEWA's Medical Insurance Fund and frequency of hospitalization, although there was a non-significant trend toward higher rates of hospitalization among SEWA members. *Table 7* summarizes the results of other studies that have examined the impact of CBHI schemes on rates of hospitalization. Almost all other studies found that community-based insurance that covers the costs of hospitalization increases hospital utilization.[3] This may reflect a publication bias, wherein the most successful schemes are the most likely to have been studied and reported on. If we accept these findings as valid, then the question arises, "why has the SEWA scheme not resulted in significantly increased rates of utilization?" The scheme's failure to impact on hospital utilization is attributable to the factors that have prevented women from using the Fund (i.e., the factors that have prevented women from submitting insurance claims). Data from qualitative interviews (Ranson 2001) suggested that members of the Fund are sometimes unaware of their membership or the benefits of the scheme. Furthermore, among those who do know about the scheme, rates of reimbursement may be considered low by members (as the Fund does not cover, for example,

[3] Note that the other study of the SEWA scheme, by Gumber (2001) has not examined the impact of the scheme on hospital utilization.

transportation or bribes), while the costs of submitting a claim (e.g., transportation to the SEWA office, opportunity cost of missed work, bribes paid to doctors for hospital certificates) are potentially quite high.

There were significant (but not consistently so) associations between SEWA membership and lower costs of hospitalization. Very few other studies have looked at whether CBHI has actually resulted in decreased out-of-pocket expenditures (*Table 7*). In a small study of four mutuals in Senegal (carried out in 2000), Jütting (2001) found that, "being a member reduces the expenditure for hospitalization by 48 percent in comparison to nonmembers holding all other variables constant." Other studies (Schneider and Diop 2001; Diop et al. 1995) have found decreased spending (both outpatient and inpatient) per illness episode. Interestingly, in our study the association between membership in SEWA's Fund and decreased hospital spending was not due to reimbursement by the scheme, as the associations remained even after we removed the five reimbursed hospitalizations from the sample. The difference then may result from methodological problems, for example, failure to adequately control for wealth or other potential confounders (most importantly, severity of illness resulting in hospitalization). Alternatively, it may be that the scheme confers protection from hospital costs in some other way. For example, doctors may charge SEWA members less as they know that the scheme is restricted to the poor, self-employed (unlikely, given that providers are usually unaware of SEWA, far less a woman's membership status in the organization or insurance scheme). It may also be that SEWA members are more sensitive to the costs of hospitalization and as a result are more likely, or better able, to seek out low-cost hospital care.

B. CONCLUSIONS AND POLICY RECOMMENDATIONS

Members of the Fund were similar to the general population in terms of wealth. The Fund's success at including the poor was probably due to its being nested within a development organization, committed to serving poor, self-employed women. Members of the Fund were older and sicker that the general population, suggestive either of adverse selection or effective targeting of those who are most in need of inpatient care. In either case, the Fund can facilitate risk pooling by broadening its membership to include younger and healthier individuals, for example, by requiring enrollment of all eligible women in a household.

Relatively few of those who were members of the Fund and were hospitalized were reimbursed through the scheme. This suggests either women are not submitting claims even when they might be eligible for reimbursement or that the claims are not eligible for reimbursement (e.g., if the hospitalization resulted from certain chronic illnesses). Given the low rate of utilization of the Fund by those who are members, it is not surprising that the Fund had no discernable impact in terms of the health care utilization. Rates of Fund utilization may be increased by providing members with information and education about their membership in the Fund, and its benefits, and by making the process of claims submission easier, faster, and less expensive.

V. TABLES

Table 1. Independent variables included in the regression analyses

Variables	Model 1	2	3
Characteristics of the household			
ESI1 to ESI5 = quintiles of economic status index, this is an approximation of household wealth based on assets, ESI1 being the poorest and ESI 5 the wealthiest (these variables are exhaustive, ESI1 is left out of the models)	✓	✓	✓
HINDU = 1 if Hindu religion, 0 if Muslim or Christian	✓	✓	✓
BKWDCASTE = 1 if scheduled caste, scheduled tribe and other 'backward castes', 0 if castes that have *not* been identified by government as 'backward' (Bhakshipanch, Brahmin, Patel, Shah, etc.)	✓	✓	✓
HHSIZE1 = 1 if 1 to 2 people in HH HHSIZE2 = 1 if 3 to 4 people in HH HHSIZE3 = 1 if 5 to 9 people in HH HHSIZE4 = 1 if >=10 people in HH (these variables are exhaustive, HHSIZE1 is left out of the models)	✓	✓	✓
Characteristics of the individual	✓	✓	✓
NON-INS = 1 if not insured by SEWA and not living with someone who is insured by SEWA SEWA-INS = 1 if covered by SEWA's Social Security Scheme SEWA-FAM = 1 if uninsured but living in the same household as someone insured by SEWA (these variables are exhaustive, NON-INS is left out of the models)		✓	✓
AGE1 = 1 if 18 or 29 years of age AGE2 = 1 if 30 to 39 years of age AGE3 = 1 if >40 years of age (these variables are exhaustive, AGE1 is left out of the models)	✓	✓	✓
LITERATE = 1 if person can read and write a simple letter, 0 if not	✓	✓	✓
MARRIED = 1 if married, 0 if never married, widower, divorced, separated, or other	✓	✓	✓
DAILYWAGE = 1 if unskilled worker being paid daily wage (agricultural or factory worker) DOMESTIC = 1 if primary occupation is domestic work/housework OTHERWORK = 1 if other than unskilled daily wages or domestic work (these variables are exhaustive, OTHERWORK is left out of the models)	✓	✓	✓
NUMBACUTE = number of acute illness episodes reported during the last 30 days (ranged from 0 to 3), intended to control for general level of health. We include this variable as a proxy, based on the hypothesis that those who are more sickly will have experienced illness episodes within the last month. This variable was included only in model 1 as it was collinear with SEWA-INS, the independent variable of interest in Models 2 and 3.	✓		
Characteristics of the hospitalization			
PUBLIC = 1 if government or ESIS hospital PRIVATE = 1 if private for-profit hospital NONPROF = 1 if "trust" or charitable hospital (these variables are exhaustive, PUBLIC is left out of the models)			✓
SHORT = 1 if 0 to 3 days hospitalized MEDIUM = 1 if 4 to 7 days hospitalized LONG = 1 > 8 days hospitalized (these variables are exhaustive, SHORT is left out of the models)			✓
OB/GYN = 1 if cause of hospitalization was pregnancy, delivery or family planning, 0 if other			✓

Table 2. Sample characteristics

Variable	SEWA-INS	SEWA-FAM	NON-INS
Number of households	**242**		**381**
Number of individuals	**270**	**125**	**607**
Mean ESI	**0.29**		**0.84**
Cat: Quintiles of ESI			
% in 1st quintile	**13.1**		**15.8**
% in 2nd quintile	**23.9**		**13.8**
% in 3rd quintile	**30.1**		**22.0**
% in 4th quintile	**13.8**		**18.9**
% in 5th quintile	**19.1**		**29.5**
Religion			
% Hindu	**80.7**		**79.3**
% Muslim	**7.4**		**18.5**
% Christian	**12.0**		**2.1**
% ST, SC, or other "backward" caste	**54.0**		**29.4**
Mean number of hh members	**5.8**		**7.0**
Cat: Number of hh members			
% 1-2	**6.1**		**3.5**
% 3-4	**30.4**		**20.8**
% 5-9	**53.0**		**52.6**
>% =10	**10.5**		**23.1**
Mean age	**40.1**	**26.3**	**35.0**
Cat: Age			
% 10-<20	**0.1**	**12.1**	**6.3**
% 20-<30	**15.9**	**61.4**	**34.0**
% 30-<40	**29.7**	**18.2**	**21.2**
% 40+	**54.3**	**8.3**	**38.4**
% Literate	**41.5**	**55.5**	**51.6**
% Married	**79.3**	**74.5**	**79.8**
% Working for daily wages	**25.0**	**11.4**	**16.9**
% Doing domestic work	**56.7**	**70.2**	**71.5**

Table 3. Hospital utilization and expenditure per hospitalization by SEWA coverage

	SEWA-INS (n=270)		SEWA-FAM (n=125)		NON-INS (n=607)
Hospital utilization					
Total hospitalizations reported	**28**		**12**		**56**
Women with >0 hospitalizations, 1 year	**26**		**12**		**51**
Probability of hospitalization	**0.095**	**NS**	**0.105**	**NS**	**0.063**
Hospital costs					
Total hospitalizations reimbursed	**5**		**0**		**0**
Women with >0 reimbursement	**5**		**0**		**0**
Mean total hospital costs, 1 year	**2,425**	**NS**	**3,532**	**NS**	**4,977**

US $1 is approximately equal to 44 Rs.

T-tests were performed to compare rates/expenditures of the SEWA-INS with NON-INS, and the SEWA-FAM with NON-INS.

* 10% (borderline) significance level; ** 5% significance level; *** 1% significance level

Table 4. Regression results for Equation 1, the odds of being SEWA-INS based on

sociodemographic variables: logit model (n=987)

	Odds ratios (t-statistics) Full Model			Odds ratios (t-statistics) Best Fit	
ESI2	**1.906**	*	ESI2	**1.837**	*
	(2.060)			(1.880)	
ESI3	**1.922**		ESI3	**1.793**	
	(1.280)			(1.090)	
ESI4	**0.961**		ESI4	**0.988**	
	(-0.150)			(-0.030)	
ESI5	**1.300**		ESI5	**1.287**	
	(0.700)			(0.650)	
HINDU	**0.720**		HINDU	-	
	(-0.550)			-	
BKWDCASTE	**2.450**	*	BKWDCASTE	**2.563**	*
	(2.000)			(1.910)	
HHSIZE2	**0.821**		HHSIZE (cont)	**0.940**	
	(-0.320)			(-1.220)	
HHSIZE3	**0.631**				
	(-1.120)				
HHSIZE4	**0.454**				
	(-1.100)				
AGE2	**3.356**	***	AGE (cont)	**1.040**	***
	(4.840)			(6.220)	
AGE3	**3.423**	***			
	(4.930)				
LITERATE	**1.166**		LITERATE	**1.166**	
	(0.410)			(0.470)	
MARRIED	**0.970**		MARRIED	-	
	(-0.160)			-	
DAILYWAGE	**0.672**		DAILYWAGE	**0.888**	
	(-1.720)			(-0.470)	
DOMESTIC	**0.601**		DOMESTIC	**0.675**	
	(-1.640)			(-1.390)	
NUMBACUTE	**1.695**	**	NUMBACUTE	**1.799**	***
	(2.690)			(3.090)	
Adjusted Wald Test, F =	**55**			**97**	
P-value =	**0.003**			**0.000**	
Percent of predictions correct =	**72.8%**			**72.9%**	

* 10% (borderline) significance level; ** 5% significance level; *** 1% significance level

Table 5. Regression results for Equation 2, the probability of being hospitalized within the last year: logit model (n=987)

	Odds ratios (t-statistics) Full Model		Odds ratios (t-statistics) Best Fit	
SEWA-INS	**2.042**		**1.668**	
	(1.220)		(0.960)	
SEWA-FAM	**1.639**		**1.999**	
	(1.000)		(1.640)	
ESI2	**0.564**		**0.522**	
	(-1.370)		(-1.540)	
ESI3	**0.801**		**0.762**	
	(-0.460)		(-0.540)	
ESI4	**0.798**		**0.690**	
	(-0.540)		(-0.890)	
ESI5	**0.275**	*	**0.253**	*
	(-1.960)		(-1.940)	
HINDU	**1.578**		**1.638**	
	(1.100)		(1.100)	
BKWDCASTE	**0.785**		**-**	
	(-0.700)		**-**	
HHSIZE2	**2.328**		**2.729**	
	(1.020)		(1.200)	
HHSIZE3	**1.687**		**2.307**	
	(0.680)		(1.010)	
HHSIZE4	**0.846**		**1.233**	
	(-0.190)		(0.240)	
AGE2	**0.450**		**-**	
	(-1.270)		**-**	
AGE3	**0.386**	*	**-**	
	(-1.990)		**-**	
LITERATE	**0.585**		**0.766**	
	(-1.190)		(-0.620)	
MARRIED	**1.522**		**1.453**	
	(0.670)		(0.750)	
DAILYWAGE	**0.733**		**0.719**	
	(-0.470)		(-0.520)	
DOMESTIC	**1.254**		**1.499**	
	(0.390)		(0.690)	
Adjusted Wald Test, F =	**36**		**21**	
P-value =	**0.027**		**0.002**	
Percent of predictions correct =	**91.6%**		**91.6%**	

* 10% (borderline) significance level; ** 5% significance level; *** 1% significance level

	Odds Ratios (t-statistics)							
	3A Full Model n=77		**3B Best Fit** n=81		**3C Outliers removed** n=74		**3D Reimbursed removed** n=70	
SEWA-INS	**-0.630**		**-1.744**	**	**-0.812**	**	**-0.789**	**
	(-1.190)		(-2.350)		(-2.290)		(-2.140)	
SEWA-FAM	**0.560**		**0.289**		**0.000**		**-0.048**	
	(0.900)		(0.300)		(0.000)		(-0.100)	
ESI2	**1.662**	**	**1.908**	***	**1.356**	***	**1.353**	***
	(2.270)		(2.930)		(4.000)		(3.960)	
ESI3	**1.779**	**	**1.237**	***	**0.550**	*	**0.551**	
	(2.800)		(2.900)		(1.740)		(1.690)	
ESI4	**2.171**	**	**1.273**	***	**1.235**	**	**1.234**	**
	(2.810)		(3.180)		(2.640)		(2.630)	
ESI5	**2.443**	**	**2.356**	**	**1.266**	**	**1.345**	**
	(2.720)		(2.580)		(2.480)		(2.620)	
HINDU	**3.630**	***	**-**		**-**		**-**	
	(3.300)		-		-		-	
BKWDCASTE	**0.465**		**1.103**	**	**0.270**		**0.268**	
	(1.700)		(2.120)		(1.560)		(1.450)	
HHSIZE2	**-1.301**	***	**-**		**-**		**-**	
	(-3.440)		-		-		-	
HHSIZE3	**-1.610**	***	**-**		**-**		**-**	
	(-3.500)		-		-		-	
HHSIZE4	**-0.581**		**-**		**-**		**-**	
	(-1.490)		-		-		-	
AGE2	**-0.246**		**-**		**-**		**-**	
	(-0.570)		-		-		-	
AGE3	**0.403**		**-**		**-**		**-**	
	(1.090)		-		-		-	
LITERATE	**0.152**		**-**		**-**		**-**	
	(0.420)		-		-		-	
MARRIED	**2.861**	**	**0.659**		**-0.019**		**-0.004**	
	(2.620)		(0.560)		(-0.020)		(0.000)	
DAILYWAGE	**0.885**		**0.412**		**-0.223**		**-0.247**	
	(0.950)		(0.430)		(-0.450)		(-0.510)	
DOMESTIC	**0.793**		**0.674**		**0.325**		**0.345**	
	(0.980)		(0.830)		(0.510)		(0.540)	
PRIVATE	**4.306**	***	**4.453**	***	**2.600**	***	**2.601**	***
	(10.710)		(5.140)		(8.220)		(8.300)	
NONPROF	**3.115**	*	**3.058**	*	**1.763**	**	**1.737**	
	(2.080)		(2.080)		(2.290)		(2.070)	
MEDIUM (4 to 7 days)	**0.206**		**1.092**	*	**0.249**		**0.242**	
	(0.420)		(1.810)		(0.740)		(0.690)	
LONG (> 7 days)	**0.716**		**1.433**	*	**1.445**	***	**1.453**	***
	(1.370)		(1.750)		(4.800)		(4.640)	
OB/GYN	**-1.379**	**	**-1.357**	***	**-1.312**	***	**-1.334**	***
	(-2.430)		(-4.170)		(-4.190)		(-3.940)	
Adjusted Wald Test, F =	**95**		**47**		**8**		**7**	
P-value =	**0.081**		**0.001**		**0.031**		**0.069**	
R-squared =	**79.32%**		**66.19%**		**67.24%**		**67.76%**	

* 10% (borderline) significance level; ** 5% significance level; *** 1% significance level

Table 7. Summary of studies looking at the impact of CBHI schemes on utilization and out-of-pocket expenditures

Study	Description of study	Utilization	Expenditure
Rwanda (Schneider & Diop 2001)	Fifty-four pre-payment schemes in 3 districts covering some outpatient and inpatient costs. What does the scheme cover? Sample size of 11,583 (2,518 HH). Data collection, yr. 2000.	Increased probability (6.6 times) of "at least one visit to professional health care provider."	Decreased (by approx. 60%) "total out-of-pocket payment per illness episode."
Senegal (Jütting 2001)	Three Mutual Health Insurance Schemes that cover part of the costs of hospitalization. Sample size of 2,987 (346 HH). Data collection, yr. 2000.	Increased "proportion of sample with at least one hospitalization."	Decreased "out-of-pocket spending on hospitalization" (48%).
India (Gumber 2001)	Self-Employed Women's Association (SEWA); covers hospital costs only, to 1,200 rupees. Sample size 1,200 HH in non-randomly selected clusters. Data collection, yr. 1998-99.	Decreased likelihood (down by 63%!) of seeking ambulatory care in case of illness. (Perhaps women are "jumping the queue"?)	No change in "total annual cost (direct and indirect) of health care use." Neither ambulatory nor inpatient.
Democratic Republic of Congo (Criel & Kegels 1997)	District-level scheme that covers 80% of hospitalization costs at referral hospital. Routinely collected hospitalization data.	Rates of hospitalization were consistently higher (1.5 to 2 times) among the insured.	-
Ghana (Atim 1999)	Nkoranza community financing scheme. Covers 100% of hospital costs for referred patients. Hospital data from 1992 to 1994.	Members are consistently more likely (2.3 to 4 times) to be admitted to hospital than nonmembers.	-
China (Bogg et al. 1996)	Comprehensive health insurance system in Jintan county. Partial reimbursement for drugs, outpatient and inpatient visits. Data from 1986 to 1994.	Evidence for increased utilization of inpatient care.	-
Niger (Diop et al. 1995)	Boboye district. Mandatory taxation. Coverage of "pharmaceutical products." Longitudinal data.	The number of initial visits (outpatient) increased by nearly 40% during the year following implementation.	Total illness related expenditure dropped by 48%.

Source: Format adapted from Jakab et al. 2001

HH = household

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