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DESIGN OF INCENTIVES IN COMMUNITY BASED HEALTH INSURANCE SCHEMES

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Foreword

Health is increasingly being viewed not only as an "end" in itself but also as a crucial "input" into the development process. Indeed a positive link between health and economic growth is widely established, particularly for low-income countries. As these countries embrace market reforms as well as integrate themselves with the world economy, there is a concern about insulating the poor from any possible adverse consequences. While the role of state is on the retreat in most economic spheres, in social sectors such as health state's role will continue to be important.

The debate on health sector reforms in India is currently underway. One aspect of the debate is the challenge of reducing the burden of health care costs by converting out-of-pocket expenditure into prepayment schemes through insurance--whether social insurance, market-based or community based insurance. The concept of community based insurance seems appealing, and may even work for people living in rural and informal sector in India. Such schemes that have been successful in parts of Sub-Saharan Africa may be appropriate for parts of India as well. But these schemes need to be tested and experimented before these can be taken up on a wide enough scale. This paper by analysing the incentive issues present in community based health insurance schemes is an important step in enhancing our understanding of how community health insurance schemes could be designed.

I am sure that the analysis of the paper will help the health policy makers, health experts, voluntary associations involved in health experiments/pilot projects, donor agencies, and all others interested in the topic.

(Arvind Virmani)
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Abstract

Community based health insurance is an emerging and promising concept that has attracted the attention of policy makers as it addresses health care challenges faced by the poor. This paper discusses solutions to important incentive problems in micro-health insurance schemes which threaten their sustainability. In particular, three issues explored are : (i) if defining household as unit of insurance always mitigates adverse selection problem; (ii) how ex ante moral hazard problem can be circumvented through group insurance contract; and (iii) how to set incentives for scheme managers. Various public policies are discussed that help to set appropriate incentives to better manage health insurance schemes in low-income country environments.

Design of Incentives in Community Based Health Insurance Schemes

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1   Introduction[#]

Health security is increasingly being recognised as integral to any poverty reduction strategy.[1] While the objective of poverty reduction remains of central concern, there has been a shift of focus away from poverty reduction *per se* to social risk management. This is so because of growing appreciation of the role risks play in the lives of the poor (Holzmann and Jorgensen 1999), and because of a strong positive link between health and poverty reduction, particularly at low income levels (Morrisson 2002, CMH 2001).

The state in most developing countries has not been able to fulfil health care needs of its poor population. Shrinking budgetary support for health care services, inefficiency in public health provision, unacceptably low quality of public health services, and the resultant imposition of user charges is reflective of state's inability to meet health care needs of the poor. In the last decade, the "health care crisis" led to the emergence of many community based health insurance schemes (CBHI) in different regions of developing countries, particularly in sub-Saharan Africa (Wiesmann and Jütting 2001, Preker et al. 2001, ILO 2002).[2] The decentralisation process unleashed in these countries to empower lower layers of government and the local community further fuelled their emergence (Atim 1998, Musau 1999). The success of community based micro-credit schemes may have also contributed to the emergence of community based health initiatives designed to improve

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[1]   While income security without health security is unsustainable, health security without income security does not make much sense.

[2]   The schemes are more concentrated in central and western parts than in eastern and southern parts of sub-Saharan Africa.

the access through risk and resource sharing (Dror and Jacquier 2000, Brown and Churchill 2000, ILO 2000). Elsewhere, particularly in regions of Asia and Latin America, community based health initiatives have come about independently and as part of income protection measures or to fill the void created by missing institutions.[3]

Direct public provision of health care services for the people lacking resources is only one of the ways of meeting their health care needs. This strategy was tried in the past under the belief that the poor are too poor to save and contribute towards meeting their health care needs. This belief has been questioned in the recent past, and there is now a growing realisation that even the poor can make small, periodic contributions that can go towards meeting their health care needs (Zeller and Sharma 1998).[4] As a result, *health insurance* is increasingly being recognised as a tool for financing health care provision in low-income countries.

Why health? Of all the risks facing poor households, health risks probably pose the greatest threat to their lives and livelihoods. A health shock thrusts health expenditure on a poor household precisely at a time when they can ill-afford it due to income shortfall resulting from the shock. Moreover, the uncertainty of the timings of illness and unpredictability of its costs make financial provision for illness difficult for households receiving low and irregular income (Tenkorang 2001). Furthermore, given the strong link between health and income at low income levels, a health shock affects the poor the most (Peters et al. 2002).

Why insurance? One, many health risk such as those relating to illness, injury, disability, maternity and the like are considered to be eminently insurable as these risks are

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[3]   Health insurance by Self-Employed Women Association (SEWA), India, and insurance provided by Grameen Bank, Bangladesh are just two of the many such examples.

[4]   In the context of pensions too, ability of low-income people to make small periodic contributions that can be tapped to provide them security during their old age finds mention in the Pensions Reform Committee Report in India.

mostly independent or idiosyncratic, that is, not correlated among community members.[5] Two, insurance separates time of payment from time of use of health services for each member, and thereby makes possible demand for such services by its members who would not have otherwise been able to afford the cost. Insurance is particularly beneficial to the poor who often bear high indirect costs of treatment due to their limited ability to mitigate risk on account of imperfect labour and credit markets.[6] Also, community-based insurance is considered to be pro-poor as it strengthen the demand side and thereby helps the poor to articulate their own needs (Develtere and Fonteneau 2001).

Neither the state nor the market is effective in providing health insurance to low-income people in rural and informal sector. The formal providers are often at informational disadvantage and face high transaction costs. On both these counts health insurance schemes that are rooted in local organisations scores over alternate health insurance arrangements.[7] Besides, community based health insurance schemes are better able to organise the provision of health services which is considered to be a pre-condition for generating demand for health insurance (Wiesmann and Jütting 2000). In rural and informal sector where supply of health services is expected to be weak, both financing and provision aspects need to be tackled simultaneously.[8] Indeed, most of the CBHI schemes have either been initiated by the health providers i.e., missionary hospitals or tend to be set around the providers (Atim 1998, Musau 1999). Thus, the potential benefit of these

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[5] Unlike many health risks, political, social and institutional risks are often covariate in nature (Weinberger and Jütting 2000). On insurability of risks, see Jütting 2002, Brown and Churchill 1999, Siegel and Alwang 1999.

[6] According to Tenkorang (2001), several studies on Africa show that demand for health care services is often hindered by immediate cash payments involved. According to Zeller and Sharma (1998), in spite of vibrant informal markets that can be observed in many developing countries, financial services for the poor remain inadequate. For credit market imperfections see Besley (1995).

[7] Local community-based or member-based institutions are better placed to harness information, monitor behaviour and enforce contract which are either too difficult or too costly for the government or for any private agency that is not a part of the community (Zeller and Sharma 1998). Since community based scheme is more likely to enjoy the support and trust of the local people, it is likely to be more successful in attracting higher membership.

[8] After all, people demand health insurance not for its own sake but to be able to buy health services. If these services are not available or if the existing health facilities do not inspire much confidence among the public there may be no demand for insurance as well.

schemes is seen not just in mobilising resources but also in improving and organising health care services.

CBHI schemes as observed in different regions of developing world are quite diverse. Nevertheless, certain features common to most of the schemes can be readily identified, such as, the voluntary participation of the people, not-for-profit objective in organising the scheme, scheme management by the community itself, and some degree of risk pooling. These schemes are reported to have made positive contribution in terms of financial protection, resource mobilisation, social exclusion, and in health care provision (Jütting 2002, Criel 1999, Desmet 1997, Supakakunti 1997, Atim 1997, Gumber 1999).[9] Although, the resource mobilisation effected by way of members' contributions varies greatly across schemes, majority of schemes depend crucially on external funding for their sustainability.[10] Likewise, although the schemes appear to extend coverage to low income populations who would otherwise be excluded from the benefits, the poorest of the poor are not covered by the schemes (Jütting 2001, Criel 1999, Arhin 1994).[11] The reach of CBHI schemes is currently limited due to small number of such schemes as well as due to their small membership but their potential reach is viewed to be considerable.

The objective of this study is to analyse the incentive issues that come up in the design of CBHI schemes. We concentrate on three issues. *First*, we examine if defining household, as opposed to individual, as unit of insurance always mitigates adverse selection problem. *Second*, we look into the problem of *ex ante* moral hazard arising from lack of preventive care and discuss ways to overcome it. *Third*, we explore the issue of setting incentives for scheme managers for widening the risk pool. None of these issues are as yet explored in the literature.

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[9]   However, few studies in the fledgling literature measure the impact that CBHI schemes have had on the health status or health outcome, which is the desirable parameter to gauge their impact.

[10]   Bennett et al (1998), in their review of schemes found the average cost recovery rate to be around 30%.

[11]   Refering to a case study in rural Senegal, Jütting (2003) shows that beside income other socio-economic characteristics like belonging to a certain ethnic group or religion might constraint the access to micro insurance schemes.

The paper is organised as follows. In section 2 we bring out how community based insurance scheme differs from either informal insurance as observed in traditional communities or market based insurance. In section 3 we present a theoretical analysis on how incentives in community-based health insurance schemes can be designed to improve the overall sustainability of the schemes. Following this, and based on the results, section 4 discusses the role of public policy. Section 5 concludes the paper.

2   The Need for Conceptual Clarity: Differences between Informal Insurance, Market Insurance and Community Based Insurance Schemes

Community based insurance (also referred to as micro-insurance) is different from informal and market based insurance. However, in the literature we often find a mix-up between informal and community based insurance and hence there is a need to point out the differences. In a nutshell community based insurance can be regarded as *hybrid* between the two other forms of insurance arrangements. It relies on the local incentive and enforcement structure while at the same time applying the logic of insurance as a game with winners and losers. The main differences between these alternate insurance arrangements are listed in table 1 and are described in detail below:

Community based insurance and informal insurance

How is community based insurance different from informal insurance? First, informal risk sharing arrangements or practices, also referred to as informal insurance, have historically been observed in many traditional communities living in risky environment.[12] These arrangements or practices have evolved to fill the void created by the absence of any specialised institutions that insure against various risks faced by such communities. Contrast this with the community based insurance that is of a very recent origin and aims to protect members mainly against income shocks resulting from illness, death of a family member or for expenditures due to festivities like marriage.[13] Community

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[12]   On informal (mutual) insurance see Platteau 1997.

[13]   In Ethiopia burial societies exist to help families to cope with the costs for funerals.

based insurance schemes have often been developed by NGOs, donor agencies and social workers.

Second, the most important conceptual difference lies in the fact that in informal insurance arrangements transfers are made *ex post*, that is, after the resolution of uncertainty, and therefore the transferred amount is contingent on the state of nature. For this reason the transfers made are equal to the transfers received, and these transfers are guided as much by self-interest as by altruism. In contrast, in micro-insurance the collection is generally done prior to the resolution of uncertainty whereas the claims are paid after the resolution of uncertainty to the unlucky members. In community based health insurance, premium collection and claims disbursement need not necessarily match in any given period. But premium collection is more predictable since it depends on the size of membership whereas disbursements are not (see Table 1).

Third, informal insurance arrangements covers variety of income and health risks facing the poor as well as non poor where as micro-insurance is aimed at covering mainly health risks and is meant for people living at low income level. However, the poorest of the poor tend to be excluded from micro-insurance.

Table 1: Important Differences in Alternate Insurance Arrangements

Features	Informal/Mutual Insurance	Community Based Insurance/ Micro-insurance	Market Insurance
Type of risk management strategy	Ex post strategy	Ex ante strategy	Ex ante strategy
Premium/Claims	All transfers ex post	Premium ex ante and claims ex post	Premium ex ante and claims ex post
Size of risk pool	Small/medium	Small/medium	Medium/large
Cross-subsidy	Yes	Yes	No
Time interdependence	Yes	No	Yes
Income group	Generally low-middle income group	Generally low-income group; poorest of the poor excluded	High and middle income group

Source: Own Compilation

However, both informal insurance and community based insurance are susceptible to breaking down in the presence of covariate or aggregate risk. Even when the risk is not covariate these tend to fall apart if too many people turn out to be unlucky or losers.

Micro-insurance and market-based insurance

Like informal insurance, market based insurance is also different from micro-insurance (Table 1). One key difference between the two is that micro-insurance is for people belonging in low income group who are not served by market based insurance provided by a firm operating purely with commercial considerations. The price of market insurance is beyond the reach of the poor who lack resources. Although some amount of resources can be mobilised from the poor by selling insurance, insurance cannot be sold purely on commercial terms. It requires some social consideration as well.

Moreover, market based insurance is a formal contract where an individual is insured and the premium charged is based on that individual's risk profile. Micro-insurance is also a contract between the organisers and the members (sometimes the organisers and the members are the same) but the difference lies in the fact that simplicity of contract requires that premium be based

on community rating, and household is generally regarded as unit of insurance.[14] Additionally, in community based insurance, individuals generally do not have pick-and-choose option. The only option people have is to take-it or leave-it.

Design and development of a scheme, with regard to the timings and periodicity of premium, is perhaps more crucial for the success of community based insurance scheme than in case of market-based insurance. However, unlike market based insurance, limited scale of community based insurance restricts scope for risk diversification.

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[14] Although in a few schemes unit of membership is individual and not a household, such schemes either have additional feature such as providing income generation or suffer from adverse selection problem. For majority of schemes household is a unit of membership. Some schemes that do allow for both individual and household membership tilts membership in favour of household by giving discount.

Finally, micro-insurance where people know about the risk profile of others, has the potential of alleviating adverse selection and moral hazard problem through peer monitoring which is not available in case of market based insurance.

One of the key similarities between these two insurance arrangements is that micro-insurance is also pretty much organised along the same lines as market insurance. That is, premiums are collected before the resolution of uncertainty and claims are paid after the nature selects the unlucky ones. Hence, micro-insurance requires pretty much requires skills such as bookkeeping, risk and fund management and so on, albeit on a smaller scale.

Understanding these basic differences between community based insurance and other forms of insurance is the first step in analysing the incentive issues present in design of community based insurance scheme which is the focus of the present study. For identifying these incentive issues we survey the subject literature which is still thin but growing.

3 Addressing Important Incentive Problems in Community Based Insurance Schemes: Adverse Selection, Moral Hazard and Incentives for Managers

3.1 Incentives to Reduce Adverse Selection: Enrolling the Family as a Unit?

Several studies on community based health insurance have reported the presence of adverse selection and moral hazard problems. The nature of moral hazard and adverse selection problems observed in micro-insurance schemes is different from the kind observed in competitive insurance markets and therefore needs to be tackled differently. We analyse each of these in some detail below.

Adverse selection problem arises when a person who anticipates needing medical treatment choose to buy insurance more often than others, resulting in higher insurance premium which drives out those persons who anticipate needing less medical treatment from the scheme. Adverse selection problem by limiting the membership and thereby the size of risk pool reduces the scope for risk diversification which tends to affect their

financial sustainability (Atim 1998, Bennett 1998, Tenkorang 1994, Ekman 2001). In the context of CBHI schemes, the adverse selection problem arises not so much due to lack of information about risk probabilities to the insuring agency but because of the need to keep insurance contract simple. The simplicity objective overrides efficiency objective, which prevents the insuring agency to charge differential premium and instead bases premium on community rating.

In controlling for the adverse selection problem, it is pointed out in the literature that enrolling the family as unit of membership seems to have done better in terms of pooling risks than enrolling individuals.[15] The idea behind an appropriate unit of membership is to extend membership beyond those who would join the scheme voluntarily (Atim 1998), and thus mitigate adverse selection problem. When household/family is a unit of membership the fee can vary with the household/family size or can be fixed irrespective of the household size. In the following we analyse this issue within the standard framework of utility maximisation.

To analyse if household as unit of membership is always superior to having individual as membership unit, we consider a 4 individual society. We make the standard assumptions on their behaviour namely, risk averse, utility maximising agents. These individuals are identical in every respect expect in their loss probability. In particular, there are two types of agents, high risk type, with loss probability denoted by p, and low risk type with loss probability denoted by q ($< p$). In this 4-individual society there can be 3 possibilities: when one of the agents is of high risk type; when two of the agents are of high risk type; and when three of the agents are of high risk type.[16] Expected utility of, say high risk, individual is given as: $(1-p)U(Y)+p\, U\,(Y-L)$, with Y representing his income in

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[15] Despite having family as unit of membership in Nkoranza scheme (in Ghana), a significant presence of adverse selection problem was observed because the family registration was widely flouted and abused. This is considered to be the weakness in the implementation and not of the design of the scheme (see USAID/PHR study).

[16] The other two possibilities, where all the individuals are of the same risk type, are not interesting since adverse selection problem arises when individuals belong to different risk type.

the no loss state and Y-L in the loss state, and U denoting the utility function which is strictly concave in income.

Furthermore, we consider a household as consisting of 2 individuals only. So, in our 4 individual society there are only two households. We define household utility as :

$$EU=(1-p)^2 U(2Y) + 2 (1-p) p U(2Y-L) + p^2 U(2Y-2L)$$

The first term on the RHS represents utility that the household gets from the household income (2Y) times the probability of both household members staying healthy (i.e., not falling sick), which is $(1-p)^2$. Similarly, the second term represents household utility when one of the members stays healthy, and the third term when none of the members stays healthy.

In a household both members pool their income and share the loss(es). This way of defining household utility assumes that a decision making unit is a household and not an individual. The literature suggests that typically in low income families of developing countries the decision making unit is indeed a household.[17] In comparing individual contract with household contract below, we assume household to be a decision making unit.

We now consider different type of household configurations under each of the three possibilities.

Possibility 1: when only one of the individuals is high risk. There can be only one configuration of households: (H,L), (L,L);

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[17] Interaction between household members is also modelled as interaction between two self-interested agents. For example, Arnott and Stiglitz (1993) define informal insurance as insurance between two family members, friends or relatives and model their behaviour as if the two are rational self-interested individuals. In this case decision making unit is an individual and not a household.

Possibility 2: when only two of the individuals are high risk. There can be two different configurations of households: (H,H), (L,L) and (H,L), (H,L);

Possibility 3: when only one of the individuals is low risk type. There can be only one configuration of households: (H,L), (H,H).

In each of these possibilities we analyse if household contract is any superior to individual contract in terms of reducing adverse selection problem i.e., attracting higher membership.

In possibility I, individual contract at pooled price can be either attractive or unattractive to low risk type.[18] If it is attractive to low risk type then household contract is as good as, and no better than, the individual contract. If it is not attractive to low risk type, then only high risk buys insurance by paying high price, based on the risk he faces. In this situation switching from individual contract to household contract would do better by attracting (H,L) household, thereby increasing the membership.

In possibility 2, first consider the configuration (H,H), (L,L). If the individual contract at pooled price is attractive to low risk type then, as in the above case, there is no gain from switching from individual membership to household membership as all four individuals would buy insurance anyway. However, if the individual contract at pooled price is unattractive to low risk type, then only high risk individuals buy insurance by paying high premium. Switching from individual membership to household membership does no better. It is in the second configuration (H,L), (H,L) that household membership can do better if the individual contract at pooled price failed to attract low risk type.

The third possibility is perhaps the most interesting because it is here that switching from individual membership to household membership can *reduce* number of people

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[18] Pooled price is given by $\lambda p + (1-\lambda)q = p'$ where λ denotes proportion of high risk type. Since pooled price involves some transfer of resources from low risk type to high risk type the pooled price is always attractive to high risk type.

covered under a scheme. This would happen when pooled price is unattractive to low risk type. In case of individual contract, all 3 high risk type would buy insurance (paying higher premium, based on their loss probability) but under household contract the household (H,L) has chance of dropping out altogether, thereby reducing membership from 3 (in individual contract case) to 2 (in household contract case).

To give a numerical example consider the following configuration of parameters:

$$Y = 100; L = 36; p = 0.5; q = 0.1; U = \sqrt{Y}$$

Given this configuration and given that there are 3 high risk individuals, the pooled premium rate is given by

$$p' = (0.75 \text{ X } 0.5) + (0.25 \text{ X } 0.1) = 0.4.$$

When *individual contract* is offered at pooled price, the household (H,L) will buy insurance for only high risk individual since the utility it gets from insuring both individuals (appox. 13.08) is less than the utility it gets from insuring only high risk individual (appox. 13.59). Now, instead of individual contract, if *household contract* is offered, the household is better off not buying any insurance (13.33) than insuring both individuals at the pooled premium (13.08). So the household will opt out of the household contract, reducing the number of insured members (from 3 to 2) who would have bought under individual contract.

So under certain conditions, defining household as membership unit can lead to perverse outcome compared to individual membership. Under what conditions is this likely to happen? This is likely to happen when the proportion of high risk individuals in the society is high and therefore the cross subsidy (from the low risk to high risk) makes the contract unattractive to households having some low risk members. When such households dropout under a household contract, the scheme also loses high risk individuals belonging to these households, who would have bought insurance under individual contract. In the

present example, the condition under which this happens is given below. The LHS expression in the following condition denotes the utility of the household (H,L) under household contract. Since the LHS is less than equal to RHS which denotes household utility without insurance, the individual is better off not buying household contract.

$$(1-p)(1-q)U(2Y-2p'L) + (1-p)\ q\ U(2Y-2p'L)\ (1-p)(1-q)U(2Y) + (1-p)\ q\ U(2Y-L) + q(1-p)$$
$$U(2Y-2p'L) + p^2 U(2Y-2p'L) \leq \quad + (1-q)\ p\ U(2Y-L) + p\ q\ U(2Y-2L)$$

To sum up, we find that household as unit of insurance is not always superior to defining individual as membership unit. Therefore, in defining appropriate unit of insurance the characteristics of target population are important.

3.2   Incentives to reduce the Moral Hazard Problem: Establishing a Group Insurance Contract

The ex-ante moral hazard problem

The moral hazard problem arises because of the tendency of individuals to behave, once they are insured, in such a way as to increase the likelihood or size of the risk against which they have insured (Criel 1998). Moral hazard problem too has implication on financial sustainability of a scheme, but in addition, it also has implications for costs of provision of such services. The moral hazard problem is of two kinds: ex ante moral hazard and ex post moral hazard problem. The ex ante moral hazard problem arises due to reduced care of health after joining a scheme. The ex post moral hazard problem arises due to over-consumption of medical services. The over-consumption may be the result of provider's behavior or due to patient's behavior. When it comes to providing health insurance to the low income people through micro-insurance we argue that it is the ex ante rather than ex post moral hazard problem that is dominant and serious. Where supply of health care services is scarcer and is distributed among many people who demand such services, its over-consumption is unlikely to assume any serious proportion. Therefore, ex post moral hazard problem in low income communities is unlikely pose any great difficult in design of health insurance. Furthermore, in a low-income society there is considerable scope for risk reduction which does not take place due to lack of health information such as

basic hygiene sense, cause-effect relationships, and preventive measures. Even where such knowledge exists, or is provided, the difficulty is in motivating the people to follow such advice.[19] The challenge instead is of encouraging preventive and promotive care among people, which is a precondition for making insurance viable and affordable.

According to the literature, ex ante moral hazard problem arises due to lack of monitoring of agent's care level that tends to reduce after the purchase of insurance. Any insurance contract drawn on the assumption that the risk probability would remain unchanged is likely to be upset. Supposing expected utility of a risk averse, expected utility maximizing agent, in the absence of insurance, is given as: $(1-p)U(Y) + p\,U(Y-L)$. The agent expend some effort, denoted as $c(e)$, to lower risk probability from p to q only when it is worthwhile for the agent to do so, i.e.,

$$(1-q)\,U(Y) + q\,U(Y-L) - c(e) > (1-p)U(Y)+p\,U(Y-L) \qquad (1)$$

Now if insurance is made available to the agent, the agent is likely to reduce the effort level. An insurance contract drawn on the assumption that the risk probability remains unchanged, is bound to be upset. This is how the ex ante moral hazard problem is defined in the literature. To overcome this problem, the literature suggests partial coverage that can take several different forms such as deductible, co-payments and so on.

We suggest below another kind of ex ante moral hazard problem. Once again the starting point is:

$$(1-p)U(Y) + p\,U(Y-L).$$

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[19] The World Bank health study on India finds the prevalence of tobacco, both smoking and non-smoking, and alcohol to be significantly higher for those below the poverty line. It infers that the poor are more likely than those with hi gher income to suffer from the negative health consequences of these behavior.

Supposing that the agent can reduce loss probability if he exerts some effort that costs him c(e), but it is not individually rational for him to do so as the benefit from reducing probability is lower than the cost associated with it, that is,

$$(1-p)U(Y) + p\,U(Y-L) > (1-q)U(Y)+q\,U(Y-L) - c(e) \qquad (2)$$

However, if the agent could insure against the loss it may be worthwhile for him to expend effort, that is,

$$U(Y-q\,L) - c(e) > (1-p)U(Y) + p\,U(Y-L) \qquad (3)$$

By paying premium (q L), the agent converts uncertain outcome into certain outcome.[20] Conditions (2) and (3) together imply that insurance (at actuarially fair price) makes expending of effort possible, which is not the case prior to the purchase of insurance.

Note that the insurance contract is designed on the assumption that the individual expends effort. This assumption is reflected in the amount of premium (q L), charged in the contract. There would be no problem if agent's effort level could be monitored by the insurer. Typically, insurers cannot monitor the effort level. In that case, it would be rational for the agent to buy the contract and not expend effort. The insurance contract drawn on the assumption that agent would expend effort is bound to be upset. This is the *ex ante* moral hazard problem defined in the present context.[21]

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[20] q is per unit price of insurance and L is the coverage level, hence, qL is the total premium amount. We assume here that the insurer makes zero-expected profit or breaks even which is not an unreasonable assumption given the current context. The implication of this assumption is that the insurer charges actuarially fair price which means that price is set equal to loss probability.

[21] Notice the difference between the way moral hazard problem is defined in the present context and that assumed in the literature where individuals expend effort in the absence of insurance and this effort level comes down after the purchase of insurance.

Having defined an ex ante moral hazard problem in the context at hand, we identify conditions under which insurance contract should or should not encourage preventive action. But before that, we state a result already established in the literature.

When U(Y-p L-π (p)) = (1-p)U(Y) + p U(Y-L), π (p) denotes risk premium. Schlensinger and Venezian (1986) show that π (p) is concave in p i.e., at some value of p, say p*, π reaches maximum. Willingness-to-pay (WTP) for complete risk elimination, denoted as v (Y,p,0), takes the form: v(Y,p,0)= pL+π (p). Given the linearity of *pL, v* also has the same property as *π (p)* i.e., concave in p.

Given this result and the ex ante moral hazard problem defined above, we get the following two results:

Result 1: For q < p ≤ p*, if condition 2 holds, then encouraging preventive action lowers agent's welfare.

Proof : Supposing *(1-p)U(Y) + p U(Y-L) > (1-q)U(Y)+q U(Y-L) –c(e)*, that is, condition 2 holds. Then using the definition of risk premium this condition can be re-written as, *U(Y-p L-π (p)) > U(Y-q L-π (q)) –c(e)*. Because q < p ≤ p*, and the fact that *π (p)* is concave in *p,* implies that π (p) > π (q). This latter condition preserves the inequality: *U(Y-p L) > U(Y-q L) –c(e),* implying that the agent is better off having full insurance without expanding effort than full insurance with effort.

Result 2: For p*≤ q < p, if condition 2 holds, then an insurance contract that somehow ensures preventive action could improve agent's welfare.

Proof : The proof runs similar in spirit to the proof outlined above. Supposing *(1-p)U(Y) + p U(Y-L) > (1-q)U(Y)+q U(Y-L) –c(e)*, that is, condition 2 holds. Then using the definition of risk premium this condition can be re-written as, *U(Y-p L-π (p)) > U(Y-q L-π (q)) –c(e)*. Because p*≤ q < p, and the fact that *π (q)* is concave in *q,* implies that π (q) > π (p) . For

the large difference between π (q) and π(p), relative to c (e), the condition *U(Y-q L) –c(e)> U(Y-p L)* may hold, implying that the agent is better off having full insurance with effort than full insurance without expending effort.

To give a numerical example, consider the following parameter configuration :

$U(Y) = \sqrt{Y}$; Y = 10,000 ; L = 3,600 ; q = 0.2 ; p = 0.53 ; c(e) = 6.7

In this example, (1 – p)U(Y)+p U(Y – L) = 89.4 > (1 – q) U(Y) + q U(Y – L) –c(e) = 89.3, implying that the individual doesn't expend effort prior to the purchase of insurance. However, after the purchase of insurance individual is worse off expending effort and buying insurance at reduced risk probability than buying insurance at unaltered risk probability (as U(Y – qL) – c(e) =96.33276 –6.7 = 89.63276 < U(Y – pL) = 89.95554). In this example, encouraging preventive action reduces individual welfare.

For result 2, let's change some of the parameter values to p = 0.8 ; q = 0.53 ; c(e) = 5.42.

(1 – p)U(Y)+p U(Y – L) = 84.0 > (1 – q) U(Y) + q U(Y – L) –c(e) = 83.98
U(Y – qL) – c(e) =89.95554 –5.42 = 84.53554 > U(Y – pL) = 84. 38009.

The above numerical example confirms result 2 : the agent is better off taking preventive action and having full insurance than full insurance at unreduced probability. However, if the preventive action is not observable the agent would rather not expend effort after buying insurance.

In case of result 2, the problem with the insurance contract (qL) which yields higher utility is that if the insurer cannot observe agent's effort level, the agent will have incentive not to expend effort. One way out for the insurer is to not assume agent to expend effort and to sell insurance at their unaltered risk probability. But that, under certain conditions, yields lower welfare as show above.

While the situation described above, of making people undertake preventive action even when it is in their own interest, amounts to questioning the standard rationality assumption about individual's behavior, we do not intend to do so. Instead, we assume that prior to insurance, taking preventive action which is costly is not in individual's interest (condition 2), but purchase of insurance can make preventive action viable (condition 3). Lowering of risks may also make purchase of insurance affordable. Given this, insurance contract needs to be designed in such a way as to ensure that people take preventive action. We demonstrate below that a group contract, as opposed to individual contract, can encourage preventive action.

A potential solution to encourage preventive action in a low-income community is not through co-payments or deductibles as it is suggested to deal with ex-post moral hazard but through a group contract designed to induce peer monitoring by limiting the number of claims.[22]

Initiating a group insurance contract

A group insurance contract can be so designed as to generate *interdependence* among group members in such a way that the members who do not expend effort run the risk of not getting their claim reimbursed. The interdependence is built by restricting the size of loss insured under the contract *vis-à-vis* total group loss. More precisely, we assume that so long as the actual loss suffered by the group as a whole is less than the insured loss, the group members do not bother about reporting to the insurer as to who undertakes preventive action and who doesn't. It is only when the actual group loss exceeds insured loss that the "careful" members report to the insurer about other members who did not take preventive action. Since the level of claim reimbursement that careful members get is dependent on their reporting about the behavior of non-careful members, it is therefore in their own interest to do so. We assume that group members can prove to the insurer as to who has undertaken prevention and who hasn't at low costs. This way of generating

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[22] However, in a market provided insurance that consists of much larger pool of individuals and where differentiated risk premium depending on individual risk profile can be charged, correcting the problem through co-payments or deductibles is generally effective.

interdependence encourages group members to keep a tab on other preventive action of other members with whom they sign up a group contract. In fact, the information about the preventive action of one's peers is readily available in the informal setting, and does not require incurring any additional costs. This knowledge of one's behavior comes handy both in formation of groups and, once the group is formed, in keeping members who do not take preventive action, out from receiving the benefits in certain situations.

In case of two identical individuals, if each of the individuals is offered an independent contract, it will fail to invoke any preventive behavior. Similarly, a group contract that covers for both illness episodes fails to generate interdependence, and hence any peer monitoring and reporting. But if two individuals are covered for, say one illness episode, the group contract can encourage preventive care. Failing to take preventive action by any one member will ensure that that member is excluded from receiving benefits if both members were to fall sick. The possibility of getting excluded in such situation would spur each individual to take preventive action. This is how by limiting the insurance cover, group insurance can generate interdependence between two individuals. However, there is another danger of both individuals forming coalition and jointly deciding not taking preventive care. An optimal group contract must rule this possibility out as well. In other words, the optimal joint coverage must ensure that any such coalition agreement is not credible. That is, it is in each individual's interest not to uphold the agreement if the other does. Let's give shape to these conditions that appear in the form of constraints in 2-individual case.

Let *group insurance contract* be denoted by *(2α, β)*, where α is the premium amount collected per person and β is the total loss reimbursement. We rule out the possibility of insurer writing state dependent contract and focus only on simple contract which is appropriate in the current context. By simple contract we mean that premium amount does not depend on state of nature but reimbursement of claim does as it is dependent on number of illness episode which, unlike preventive action, cannot be hidden. If any one of the two agents suffer loss, the loss is made good to the extent of β. However, if both the individuals suffer loss each agent is given half the value of β provided both

agents expend effort or none of them expend effort; and if one of the agents expend effort the entire benefit (β) goes to that agent.

The three constraints that must be satisfied are: one, that it should be in individual's interest to buy insurance (participation constraint); two, after buying insurance it should be individual's interest to expend effort (incentive compatibility constraint); and finally, any coalition agreement between the two individuals on not expending effort is not credible ("anti-coalition" constraint). These three respective constraints are shown below.

The first constraint is *the participation constraint (PC)* –also called individual rationality constraint--which sets minimum coverage that must be offered in a group contract so as to encourage the individual to form a group and buy the contract. This constraint takes the following form:

$$(1\text{-}q)\, U(Y - \alpha) + q\, [(1 - q)\, U(Y - L - \alpha + \beta) + q\, U(Y - L - \alpha + \beta/2)] - c\,(e) \geq (1 - p)\, U(Y) + p\, U(Y - L) \tag{PC}$$

The RHS of the above constraint represents agent's reservation utility which the agent must get to be able to participate in the contract while the LHS represents agent's expected utility drawn on the assumption that the agent undertakes preventive care. Different terms appearing on the LHS show agent's utility under different states of nature times probability of that state occurring.

The second constraint is *the incentive compatibility (IC)* which ensures that it is in individual's interest to expend effort after joining the scheme. The constraint takes the following form:

$$(1\text{-}q)\, U(Y - \alpha) + q\, [(1 - q)\, U(Y - L - \alpha + \beta) + q\, U(Y - L - \alpha + \beta/2)] - c\,(e) \geq (1 - p)\, U(Y - \alpha) + p\, [(1 - q)\, U(Y - L - \alpha + \beta) + q\, U(Y - \alpha - L)] \tag{IC}$$

The third constraint is *the anti-coalition (AC)* which ensures that it is individually rational not to adhere to any joint agreement on not expending effort. This constraint is expressed as:

$$(1 - q) U(Y - \alpha) + q U(Y - L - \alpha + \beta) - c(e) \geq (1\text{-}p) U(Y - \alpha) + p [(1 - p) U(Y - L - \alpha + \beta) + p U(Y - L - \alpha + \beta/2)] \tag{AC}$$

The fourth constraint is *zero-expected profit constraint* that ensures that the premium charged is actuarially fair.

Note that the only difference between these two terms is in the effort cost that affects loss probability, therefore, the RHS of the AC constraint is strictly greater than LHS of the (IC) constraint.

The above constraints are drawn on the assumption that $\beta < L$. In case where $\beta \geq L$. These constraints take the following form:

$$(1\text{-}q) U(Y - \alpha) + q [(1 - q) U(Y - \alpha) + q U(Y - L - \alpha + \beta/2)] - c(e) \geq (1 - p) U(Y) + p U(Y - L) \tag{PC'}$$

$$(1\text{-}q) U(Y - \alpha) + q [(1 - q) U(Y - \alpha) + q U(Y - L - \alpha + \beta/2)] - c(e) \geq (1 - p) U(Y - \alpha) + p [(1 - q) U(Y - \alpha) + q U(Y - \alpha - L + (\beta - L))] \tag{IC'}$$

$$(1 - q) U(Y - \alpha) + q U(Y - \alpha) - c(e) \geq (1\text{-}p) U(Y - \alpha) + p [(1 - p) U(Y - \alpha) + p U(Y - L - \alpha + \beta/2)] \tag{AC'}$$

Result 3: Let $(2\alpha, \beta)$ denote group insurance contract. If constraint set is non-empty, the optimal group insurance contract provides partial insurance and corrects for *ex ante* moral hazard problem. Under certain conditions, group insurance may be superior to individual insurance.

An optimal contract is one that provides maximum coverage subject to these three constraints and, of course, the zero-expected profit constraint. Participation constraint merely sets lower bound on the coverage that must be provided to elicit participation by the two individuals. The other two constraints define the upper bound on the coverage level. At the optimum only one of these other two constraints is binding. If the participation constraint is satisfied, the optimal coverage (α^*, β^*) is determined by one of the other constraints.

The next question to ask is if group contract is *superior* to individual contract. The necessary conditions for this to hold are: $p^* \leq q < p$ and the affordability condition (implying that individual cannot pay premium beyond certain level). To show superiority of group contract, we control for the amount of premium paid in both the cases. That is, we compare agent's utility under group contract with that under individual contract (controlling for the premium level under individual contract, that is, buying that level of coverage under individual contract that the premium paid under group contract allows).

A simple numerical example demonstrates the basic point. Taking the same parameter configurations:

$$Y = 10000, L = 3600, p = 0.8, q = 0.53, U = \sqrt{Y}; c(e) = 5.42.$$

With the above configuration we have already shown above that the agent is better off taking preventive action and having full insurance than full insurance at unreduced probability.

At this level of parameter configuration, the incentive compatibility constraint becomes binding first and therefore determines the optimal level of coverage under group contract which is 4082, and each individual pays premium of (appox.)1334.

At this level of premium and coverage, utility that each agent gets is (appox.) 85.2. The same level of premium (1334) allows for the coverage level of (appox.) 1668 under individual contract. At this level of coverage the utility that agent gets under individual contract is (appox.) 84.3, which is lower than the utility the agent gets under the group contract. Hence the group contract is superior to individual contract entailing the same level of premium expenditure.

To sum up, we define the moral hazard problem likely to be present in the context at hand, and specify the condition under which this problem could be mitigated through a group insurance contract. In demonstrating this we assume no externality in prevention activity. However, if a positive externality exists in prevention activity, the argument in favor of group contract would only get reinforced.

3.3   *Incentives to Increase the Risk Pool: Managers Payment Contract*[23]

Besides the issue of appropriate design of insurance contract, there is an additional issue, namely of providing appropriate incentives to scheme managers for improving scheme's performance through, for example, widening of risk pool. We make a distinction between the *organisers* and *managers* of a scheme. Organisers are typically the donor agencies, policy makers and others working with the objective of building health security into the lives of the poor through CBHI schemes. The scheme managers, on the other hand, refer to those who are in-charge of actual running of the scheme.

In community based insurance, the sustainability issue, which is affected by the quality and the size of risk pool, is not faced *directly* by the individuals (members) who participate in the scheme.[24] The sustainability issue is faced by the organisers and by the scheme managers. The organisers need to provide incentives to managers for economising the costs.

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[23] This issue, we believe, would become increasingly important as the schemes are up scaled or replicated.

[24] However, members of a scheme do get affected if the scheme runs into trouble due to small membership size.

Broadly, there are three types of costs faced by the managers of a scheme. The first relates to the claims cost that has a direct relation with the number of scheme members. The second relates to certain administrative expenses such as paying commissions for collecting premium from old and new members.[25] These costs also vary with the number of members. Finally, there are certain fixed costs incurred for starting a scheme (the start-up costs).

While in a market based insurance all these costs are taken into account, in community based insurance inclusion of such costs in the price of insurance would jack up premium, which may exclude many poor individual/households from joining the scheme. Probably, the best form that subsidy can take is in meeting fixed costs involved in setting up of a scheme. Certain recurring administrative expenses such as those involved in maintaining accounts, salaries to managers etc can also be financed through subsidies. The CBHI schemes must strive to at least meet all claims cost from premium amount collected from the members. Achieving this goal is as much dependent on the members' ability to pay premium as on scheme managers' incentive to encourage membership, improving pool size, charging differential premium wherever possible, negotiating with the healthcare providers and so on. Therefore it is essential that incentives for mangers for performing these functions be set appropriately.

There is little mention in the literature on the kind of incentives given to the managers of schemes. External funding from donor agencies, on which some information is available, suggests that there is room for improvement. The incentives can be better aligned with the interests of managers. This wasn't the case in some of the schemes. For example, in Nkoranza scheme the external donors virtually guaranteed against all deficits, whatever that amount be. This is believed to have adversely affected managerial performance (USAID/PHR Ghana case study).[26] However, the same was *not* repeated in

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[25] In case of new members the commission is typically higher.

[26] The evaluation of the Nkoranza scheme noted serious shortcomings that were masked by external donations.

the West Gonja scheme and the external funds were used only in case of real emergency and not as part of current income.

A small membership provides limited scope for risk pooling which has a bearing on the financial sustainability of schemes because of high variance displayed by actual claims vis-à-vis expected claims. In a scheme, premium is calculated based on the expected claims from the members over a period of time. But, in any given period, the actual claims may depart significantly from the average claims in which case the scheme managers must have access to credit, instead of non-repayable funds, to meet the shortfall in the premium collection vis-à-vis claims costs. If managers know that any amount of shortfall in premium collection will be made good by grants or subsidies, they will have little incentive to manage the scheme well.

The organizers must devise the remuneration package for the managers so that the latter have incentive to (a) expand the risk pool, and (b) not expand the pool recklessly i.e., without paying heed to the risk profile of new members. Unlike large risk pool, in a small pool actual claims tend to significantly depart from expected claims. The figure below demonstrates this fact: as the size of risk pool increases, the spread of actual claims around expected claims becomes narrower.

Figure 1: Claims Variation and Size of Risk Pool

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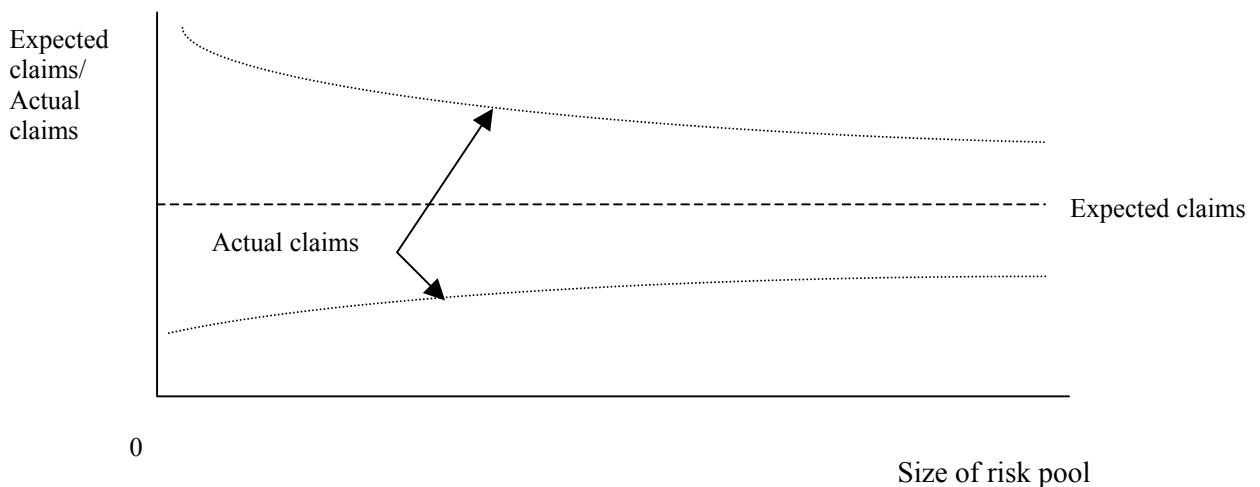
What incentives are devised for scheme managers depends very much on the assumption made about the managers, that is, whether the managers are *risk neutral* or *risk averse*.

Assuming that managers are risk neutral, which is likely to be the case, they would be indifferent between receiving a particular amount for sure *and* a lottery having expected value equal to the sure amount. At any given level of membership (or pool size), actual claims over a period of time will be equal to expected claims. Since the pool size affects only the variance or spread of the actual claims around the expected claims the managers will have no incentive to reduce variance by expanding the risk pool. In that case, we propose the following incentives for managers:

$$I = AN + Min\ [(1-p)\ RN,\ (1-s)RN]$$

where, I = manager's incentive; A = fixed amount per member; N = total number of members; R = amount paid per member who do not claim; p = expected loss probability; s = actual loss probability.

Manager's remuneration has two components. The first component, which is a certain fixed amount (A) per member times the membership size, defines the amount managers get for covering the costs involved in attracting a new member or to retain an existing member into the scheme. The second term defines managers incentive for widening pool size, and also not widening the pool recklessly since the remuneration is linked to the number of people who do not claim. This term is a "Min" expression which denotes that the mangers get the minimum of the two terms in the bracket. The first term inside the bracket defines manger's remuneration in case actual claims are *lower* than the expected (s<p). In this case the remuneration that manager gets is based on the expected claims. If the actual claims *exceed* expected claims (s>p) then the manger gets remuneration based on the second term inside the bracket i.e., on the basis of actual claims. So, there is asymmetry built into the remuneration of managers. The manager gets penalized if actual claims exceeds expected but doesn't get rewarded should the reverse

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happens i.e., when actual falls short of expected. It is this asymmetry that drives the risk neutral manager to enlarge risk pool so as to increase their remuneration. (Note that the manager's remuneration is the highest when the actual number of claims is equal or lower than expected claims). If this asymmetry is not built into the remuneration of managers, and managers are instead given only on the basis of actual claims, then managers will not have any incentive to expand size of pool.[27]

This incentive structure would encourage manger to seek good risk and/or set minimum preventive action in case of bad risk. This can be ensured only if part of managers' remuneration depends on the number of members who didn't make claim. This will also check against the behavior to recklessly increase membership.

So, we find that defining explicit incentive for scheme managers is important for improving the coverage and reach of the schemes and thereby improving schemes' sustainability. To achieve this desired result, we indicate above how the remuneration package for scheme mangers could be devised.

4   The Role of Public Policy in Setting the Right Incentives

Public policy plays a crucial role in expanding the scope of this emerging and promising institution in meeting health care needs of the poor population in developing countries. A key issue relates to the design of incentives to improve the performance of CBHI schemes. Improved performance has a bearing on the reach of the scheme as well as on the scheme's reliance on external funding or subsidies.

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[27] If we assume managers to be risk averse then design of incentives would be different from what is outlined above. For risk averse managers, the remuneration package could just be linked (negatively) to the actual claims, giving higher reward when the actual claims fall short of the expected and lower reward when the opposite is true. The remuneration package could take the following form: $I = AN + (1-s)RN$. This way of defining their remuneration package will cause high variation in their remuneration when the risk pool is small. Because of their being risk averse, they would be induced to reduce to variation in their remuneration by enlarging the pool size. Note that this incentive scheme will not work for risk neutral managers. In both cases, since the remuneration is linked to the number of members who do not claim, managers will pay heed to the risk profile of a person in widening of the pool.

Often, lack of ability of the people to pay full insurance premium is considered to be the rational for providing external funding or subsidies. While there is no denying the fact that CBHI schemes need some external funding or subsidies, the form that such funding or subsidies take can make or mar the performance and hence the sustainability of a scheme. This paper hints at the various form that subsidies can take without distorting incentives. Hence, the important policy question is what form should a subsidy take? The findings of this paper suggest that subsidies should not distort incentives for an appropriate design of the schemes. Appropriate design of schemes refers to the control of the adverse selection and moral hazard problems as well as devising incentives for scheme managers. Probably the best form of giving subsidy is in meeting start-up costs that are essentially of fixed-cost nature, and therefore, distort the incentives the least. By the same reasoning, subsidy could also be given for meeting certain recurring administrative expenses such as salaries of personnel, maintaining accounts, medical vehicle as well as equipment and so on. Furthermore, given the low capital base of the schemes, subsidy could also take the form of making funds available at low interest costs to cover the premium shortfall. This shortfall should not be covered through grants as it interferes with manager's incentives to improve scheme's performance. External funding could also go into financing the cost of generating health consciousness among the public, spreading awareness about the benefit of joining a scheme, training of the personnel in managing risk and funds and so on.

Subsidy meant for including the poorest of the poor who cannot contribute anything towards premium need to be directly linked to the number of such members. Most CBHI schemes currently tend to exclude the poorest of the poor. A promising way to cover the poorest of the poor is to subsidize the premium per poor member instead of lump sum aggregate amount per annum to the scheme, and the percentage of such members should be linked to the total group size. That way managers will be encouraged to include other (non-poorest of the poor) members in order to get entitled to receiving subsidy for including more of the poorest of the poor. For example, if donors bear premium cost of 5% of the total members with the intentions of bringing the poorest of the poor under the scheme, then the managers will be induced to enlarge scheme membership in order to become entitled to cover higher number of the poorest of the poor.

Besides subsidies and incentives, there are other important areas where public intervention can be helpful. Health insurance is not for its own sake but for enabling an insured person to demand health care services when in need. Health insurance is of little value if the supply side is weak. Government could play an active role in strengthening supply of health services. At institutional level too government has a role in providing legal status to the scheme. Currently, most CBHI schemes have little or no legal standing which tends to create some uncertainty in the minds of the public about the continuity of schemes. Providing legal status may inspire confidence among the local public, resulting in higher membership.

Another way in which government could help the schemes is in providing some insurance mechanism against risks. CBHI schemes might be successful in insuring against idiosyncratic health risks and not for correlated risks. In the event of catastrophic risks these schemes tend to collapse. Such risks can best be insured against through alternate public arrangement. Even for the idiosyncratic risks there is a limit on the size of risk pool that can be attained. Government could help in diversifying risk through social reinsurance (Dror and Preker 2002).

Like user fees, insurance should be seen as a measure that complement other measures of building health security for the low-income people. More generally, insurance is only one of the risk management strategies available to the people. Government could improve the risk management strategies of the poor through improved functioning of the labor, credit and product markets. Similarly, health security needs to be integrated with other government programs aimed at building income and health security for the poor.

5   Conclusions

Community based health insurance schemes have come up in different regions of developing countries, and these schemes appear promising in meeting health care challenges facing the poor. This paper highlights some avenues to set appropriate

incentives in CBHI schemes for improving scheme performance in terms of increasing their membership as well as in improving their financial position which influences their sustainability.

The adverse selection and moral hazard problems generally observed in health insurance are prevalent in existing CBHI schemes as well. But the way these problems could be mitigated in CBHI schemes is different. A number of measures have been suggested in the literature to mitigate these problems but the evidence available as yet is thin to be able to rank different alternatives in the order of their efficacy. The paper deals with three kind of incentive issues that come up in the context of CBHI schemes, and shows a way of dealing with these issues.

The best way of providing incentives depends very much on the context, that is, on the characteristics of the target population and the health risk profile. What alternatives may work in any one setting may not work in another. For example, we have shown that defining household as unit of insurance as suggested in the literature is not always appropriate. Similarly, the design of a scheme needs to take note of the nature of moral hazard problem present in a particular context, that is, whether ex ante or ex post moral hazard problem, and if ex ante problem, then what kind of ex ante problem. Likewise, what remuneration package to set for scheme managers depends very much on the behavioral assumption made, that is, whether the managers are risk neutral or risk averse. Indeed, sculpting an appropriate scheme is a craft. In that, a person has to bring one's knowledge of the social context to bear with the available empirical evidence on scheme functioning elsewhere. Blindly copying of the scheme that has worked well elsewhere in a different setting is unlikely to succeed.

Besides building incentives and appropriately designing insurance contract, success of a scheme depends also on a number of other design features such as the timing and periodicity of premium collection, the type of health risks to be covered and so forth. These features are also perhaps as important as successful handling of the incentive issues explored in the paper. Future research should address these other issues.

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