CHAPTER TWO

CONCEPTS, REVIEW OF LITERATURE AND METHODOLOGY

2.1. Introduction

This chapter explains the concepts used in the study, presents a critical review of relevant literature, data sources and methodological aspects of the study. First, the basic concepts of HI are explained. Further, the review of literature is organized on selected themes with an objective of elaborating the conceptual, theoretical and analytical frame of the study. The literature review is organized under the following themes namely, Health Insurance Market, failures in Health Insurance Market, Demand for Health Insurance, Willingness to Pay for Health Insurance, and Some selected study on Health insurance schemes in India. Subsequently, the data sources and methodological aspects of the study are described at greater detail.

2.2. Health Insurance: Basic Concepts and Principles

Normally people seem to dislike risk. What is unpredictable to an individual is predictable to a group of individuals. Health care expenses are not only expensive but highly random in nature. Health Insurance mechanism provides a way by which risk sharing within a society may take place (Akin, 1987). One of the most efficient ways of providing access to universal health care is to pool health risks between rich and poor, young and old, and employed and unemployed, to enable cross subsidization in the form of health insurance. HI is a mechanism of pooling fund from its members and paying them when they fall sick. The fundamentals of risk pooling and sharing depend on to what extent both the risks and incomes related cross subsidization, that is, risk solidarity and income solidarity are prevalent. Cross subsidization can be classified into two types as vertical and horizontal. Vertical cross subsidization is
realized when solidarity is achieved between groups, for example, pooling
the health risk between rich and poor, young and old, and employed and
unemployed etc, while horizontal cross subsidization is within the groups,
that is, the healthy would pay for the illness costs of the sick in the same
group. The vertical cross subsidization will promote an efficient and
equitable risk pool. Moreover, an efficient insurance system is based on
the law of large numbers, that is, it requires large risk pools.

The literature summarizes the case for HI under the following three
categories, namely i) illness cannot be predicted, ii) hospitalization costs
are lumpy and cannot be planned, iii) the proportions falling ill requiring
hospitalization in any large population is small and, therefore, permits
risk pooling. These three factors enable a person to cover the risk of
illness at a very small cost, provided an appropriate insurance scheme is
in position (Krishnan 1996). By pooling financial contributions from many
people, insurance plan can cover the hospital expenses of those
experiencing catastrophic events, such as near-fatal illness or injury. The
experts of health care financing argue that there is no alternative to
pooling medical risks that provides the same level of protection to its
members. On equity angle, within the risk pool, benefits are provided on
the basis of need rather than by income class. Further, payments go to
the sickest people, and, because lower income and less-educated people
tends to be sicker, they also have the potential of benefiting more from
insurance claims (Mc Greevy 1990).

The premium of insurance (cost of insurance) is determined by the value
of actuarially fair Premium (expected payoff) and the price (loading fees) of
insurance. Health insurers determine actuarial premiums by using either
community or experience rating. When an insurance company uses
community rating, the actuarial premium is based on the risk
characteristics of its entire membership and there is no discrimination in
actuarial premium calculations on the basis of age, health status, claims
history or other factors (everyone pays the same premium for the same
product, irrespective of their risk or previous claims experience). In

8 The insurance system using such a premium rating is called as Private community-rated
health insurance and Private risk-rated health insurance models, respectively.
contrast, when actuarial premiums are determined using experience rating, insurers place individuals, or a group of individuals, into different risk categories based on various identifiable personal characteristics, such as age (as a health proxy), gender, industrial occupation, and prior illness and will be charged different premium accordingly. Another way of fixing actuarial premium is through risk rating, which is a mix of both community and experience rating. Insurers add loading fees to the actuarial premium to arrive at a total premium. Loading fees cover the administrative costs of supplying insurance, specifically, the costs of marketing, underwriting, management, advertising, and claims processing. In conventional theory, the loading fee portion of the premium is considered the “price” of insurance because it represents the cost of transferring the risk of medical expenditures from the individual consumer to the insurer. Therefore, the price of insurance is the portion the premium over and above the payment for the expected medical care expenditures (Phelps, 1997).

To regulate and monitor the health care utilization of insured people, insurers normally use the techniques of co payments and indemnity payments. There are two types of Co-payments: 1) Co-insurance where the beneficiary must pay a certain percentage of the medical care expenditure specified in the health insurance policy; 2) Deductibles where insured pays a fixed amount of the medical care expenditure. The indemnity payments are a kind of Pay out limits where insurance company pays no more than an established amount.

Individuals can take up insurance individually, or the cover can come as parts of a group which are referred to as 'Personal or Individual' and 'Group' health insurance, respectively. The distinction between group insurance and individual health insurance is important because the former can bring important social elements into the private cover. Premia under group insurance are often lower because insurers bear lower administrative costs and the size of the pool is greater.
2.3. Health Insurance Market

Economists generally favour choice in health insurance for the same reasons they favour choice in other markets; choice allows people to opt for a plan that is best for them and encourages plans to provide services efficiently. But choice in HI is a mixed blessing because of adverse selection due to which people can select their policies according to their health risk and insurers can reduce the degree of adverse selection problem by offering insurance coverage to the needy after distinguishing them. However, optimal design of policies must make tradeoffs appropriately between risk sharing, on the one hand, and agency problems such as moral hazard and supplier induced demand (cost escalation), on the other.

Michael E. Chernew et al (1999) examined existence of equilibrium in insurance markets when the number of insurance policy attributes is increased (i.e., managed care is introduced). Individuals choose an insurance contract from an endogenous choice set. The introduction of managed care improves the ability of low risks (from healthy people) to distinguish themselves from high risks (from unhealthy people). However, managed care expands the product space in which a pooling policy could break a separating equilibrium.

One of the major problems of an unregulated competitive market for individual health insurance scheme is the seeming incompatibility of the equivalence principle and the solidarity (or fairness) principle. The equivalence principle of a competitive insurance market implies that an insurer has break even on each insurance contract. The solidarity principle implies that the high-risk individuals receive a subsidy from low-risk individuals to access the health insurance coverage.

The two types of solidarity in health insurance market, which may lead to cross subsidization, are risk solidarity (solidarity between high risk and low risk individuals) and income solidarity (between high-income and low-income individuals). In a competitive market a system of cross-subsidies cannot be sustained because competition minimizes the predictable profit.
per contract. Consequently, an insurer has break-even on each contract either by adjusting the premium to the consumer's risk (premium differentiation) or by adjusting the accepted risks to the premium (selective underwriting).

Because of the importance of health insurance coverage in meeting the huge medical bill in the uncertain illness episode, access to health insurance coverage is an important aspect in the HI literature. Premium rate restrictions are often considered a tool to increase access to coverage for high-risk individuals in such a market. The study by Wynand et al (2000) analyzed 3 strategies to increase a high-risk individual's access to coverage in a competitive individual HI market: 1) Premium rate restrictions for specified HI coverage, 2) Risk-adjusted premium subsidies, and 3) A combination of both. By considering the risk-adjusted premium subsidies, the study inferred that subsidy approach is the preferred strategy to increase access to coverage for high-risk individuals. According to this study, a competitive market for individual HI tends to risk-adjust the premiums. It can be also seen that, now-a-days, the premium per person may be related to age, gender, family size, region, occupation, length of contract period, individual or group contract period, the level of deductible, the sum insured, health status at the time of enrolment and health habits such as smoking, drinking, exercising (Abel-Smith 1992).

When markets cannot charge premium that accurately reflect the individual’s risk of using covered services, competition is not efficient; low risks are not able to purchase comprehensive coverage in such markets (Rothschild, M and Stiglitz 1976). Pauly (1974) and Stiglitz (1994) have argued that compulsory pools are a Pareto-improvement over competitive markets, which is an indication for the need of government intervention in the HI market. Pools can make all consumers better off because the low risk's gain from purchasing more complete coverage is greater than the subsidy required for the high risks. Because government is the only social organisation with compulsory membership, it alone has the power to

9 There are two types of premium rate restrictions- Community rating (by class), and a ban on certain rating factors, or rate banding (by class).
enforce a welfare-enhancing pool of low and high-risk individuals. Dahlby (1981) has pointed out that this conclusion is valid only if Nash equilibrium does not exist in the competitive insurance market. Wilson (1977) has shown that compulsory partial pooling which permits private insurers to sell supplementary coverage may represent a Pareto-improvement over the competitive equilibrium.

If premium for HI are not risk related, there exists a consumer information surplus that may result in adverse selection. The study by Wynand et al (1995) revealed that insurers can greatly reduce this surplus by risk-adjusting premium. They concluded that there need not be any substantial unavoidable consumer information surplus if consumers can choose whether to take a deductible for a one or two-year HI contract with otherwise identical benefits. Therefore, adverse selection need not be a problem in a competitive insurance market with risk-adjusted premiums or vouchers and with such a consumer choice of health plan. For example, in Chile, private insurance does not face adverse selection, possibly due to the design of insurance plans. However, this design does not prevent over-utilisation.

According to Randall P. Ellis (1998), reimbursement incentives influence both the intensity of services and who is treated when patients differ in severity of illness. He compared the social optimum to the private Cournot-Nash solution for three provider strategies: creaming - over-provision of services to low severity patients; skimming - under-provision of services to high severity patients; and dumping - the explicit avoidance of high severity patients. Cost-based reimbursement results in over provisioning of services (creaming) to all types of patients. Prospectively paid providers cream low severity patients and skim high severity ones. If there is dumping of high severity patients, then there will also be skimming.

It can be seen that the above discussed review deals with the issues like the importance of choice in the health market in order to deal with the selection issues, changes in premium rate as a way to increase access for different category of risk people, and market equilibrium. In this context, it can be observed that the Indian health insurance market, even though
at the infant stage, is characterized by varieties of HI products offered by 11 insurance companies, comprising of both public sector and private sectors. By a preliminary look up on each policy, it can be inferred that the insurance policies of each company is different from the rest in its design and characteristics. Moreover, the premium rate for each insurance policy varies according to disease, age, gender, group/single policy and total insured amount. The present study will analyse how each policy will address the issues like the high health risk and low health risk people, and their access, cream skimming, the over-utilization etc. Recently, the introduction of managed care in the Indian health insurance market by the Insurance Regulatory and Development Authority (IRDA) in the form of Third Party Administrators (TPAs) may be expected to influence the features of the insurance policies.

2.4. Market Failures in Health Insurance Market

There are mainly 2 forms of market failures in HI market, namely Selection Bias (adverse selection) and Moral Hazard.

2.4.1. Selection Bias

Asymmetric information about potential demand for medical care creates another analytical problem for insurance markets. Individuals themselves know much about their health condition than the insurance companies.

Selection can be described as actions by insurers and consumers to exploit un-priced risk heterogeneity and break pooling arrangement (Akerlof, 1970). It can be classified into two types - Adverse Selection and Cream Selection (skimming). The problem of adverse selection is present in all lines of insurance due to the hidden information, the people insuring themselves are those who are increasingly certain that they will need the insurance (Akerlof 1970). “Adverse selection” arises because individuals face different risks. Customers who know themselves to be at high risks are motivated to buy more insurance and are likely to use it (WDR 1993). In a population of individuals whose underlying health risks
are heterogeneous, more or less healthy people will demand different insurance policies, which will be an "adverse selection" for the insurance companies. Defensive efforts to obtain valuable information about risks add to the cost of insured health care without improving health outcomes. Adverse selection presents a serious problem for risks existing at the time when insurance is taken up but an even and more complex problem arises from the fact that an initially low risk person becomes high risk later in life (WDR, 1993). Neither solution is easy to implement because of the extreme uncertainty; insurance can cover known risks but not uncertain risks.

A straightforward method of preventing an extreme form of adverse selection - that is, one in which low-risk individuals do not buy the specified HI coverage and thereby do not cross-subsidize the high risk individuals - is to mandate that everyone buys the specified HI coverage. On the contrary, a straightforward method of preventing an extreme form of cream skimming - that is, one in which insurers refuse to (renew a) contract with relatively high-risk individuals - is to require open enrolment. The cream skimming may result in the exclusion of the population group consisting of aged, poor, women and high health risks.¹⁰

¹⁰ A detailed discussion on various aspects of adverse selection is attempted in one of the subsequent chapters.
Table 2.1 A summary of different studies about selection bias

<table>
<thead>
<tr>
<th>Paper</th>
<th>Data</th>
<th>Empirical Methods</th>
<th>Highlights of the results</th>
<th>Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juba, Lave, and Shaddy (1980)</td>
<td>Carnegie-Mellon University employees' health insurance enrollment and survey</td>
<td>Maximum likelihood logit estimates of determinants of plan choice</td>
<td>Lower family self-reported health status results in significantly less chance of selecting HMO enrollment</td>
<td>Adverse</td>
</tr>
<tr>
<td>Farley and Monheit (1985)</td>
<td>1977 National Medical Care expenditure survey</td>
<td>OLS and 2SLS estimation of health insurance purchases</td>
<td>Ambulatory care expenditures have an insignificant impact on health insurance purchases</td>
<td>Ambiguous</td>
</tr>
<tr>
<td>Wrightson, Genuardi, and Stephens (1987)</td>
<td>Disenrollees from 7 plans offering different types of managed care</td>
<td>Comparison of costs and disenrollment rates for insures</td>
<td>Disenrollees have lower inpatient costs and occupy less risky demographic groups than continuing enrollees</td>
<td>Adverse</td>
</tr>
<tr>
<td>Cardon and Hendel (1996)</td>
<td>National Medical Expenditure Survey</td>
<td>Tobit-style model insurance choice</td>
<td>Individuals who are younger, male, or in &quot;excellent&quot; self-reported health are significantly less likely to become insured</td>
<td>Adverse</td>
</tr>
<tr>
<td>Ellis (1985)</td>
<td>1982-83 employee health plan enrollment and expense records of a large firm</td>
<td>Logit estimates of health plan choice</td>
<td>Age and worse previous years' health expenses are associated with choice of more generous health coverage for the next year</td>
<td>Adverse</td>
</tr>
<tr>
<td>Marquis (1992)</td>
<td>Plan selection of families in Rand Health Insurance Experiment</td>
<td>Comparison of plan choices with age/sex adjustments under various group-rating regimes</td>
<td>73% more individuals in high risk quartile choose most generous plan than those in low risk quartile, even with age/sex or experience rating</td>
<td>Adverse</td>
</tr>
<tr>
<td>Van de Ven and Van Vlenit (1995)</td>
<td>Survey and claims data from 20,000 families insured by largest Dutch insurer, Zilveren Kreins</td>
<td>Regression of risk factors on prediction error of difference in costs between members of high and low cost plans</td>
<td>Age-and sex-composition of plans explain 40 % of error in predicted cost differential between plans</td>
<td>Adverse</td>
</tr>
</tbody>
</table>
2.4. 2. Moral Hazard

One of the limits, which have been much stressed in insurance literature, is the effect of insurance on incentives (Arrow 1965). It is frequently observed that widespread medical insurance increases the demand for medical care. Moral hazard (hidden action) refers to the likely malfeasance of an individual making purchases that are partly or fully paid by others (Arrow, 1965; Pauly, 1968 and 1974; Zeckhauser, 1970; Kotowitz, 1987). It occurs when members of a HI plan use services more frequently than they would have had they not been the members. In short, the moral hazard occurs when insurance contracts are written on the basis of endogenously incurred expenses and not on the basis of exogenous health needs (William, 1999). Moral hazard is a concern because it conflicts with risk spreading goals. HI involves a fundamental trade off between risk spreading and appropriate incentives.

Increasing the generosity of insurance spreads risk more broadly but also leads to increased losses for the insurance companies because individuals choose more care (moral hazard) and providers supply more care (principal-agent problems). Pauly (1987) attributes incomplete HI coverage to "moral hazard". That is, for insurance markets to produce an optimal allocation of resources, the method of insurance must be neutral with respect to the demand for medical care. Neutrality is absent with insurance because the price of medical care to the insured is below marginal cost, leading to inefficient usage of medical care resources. Moral hazard also results from patients making less effort to search for low cost providers.

Moral hazard arises because medical needs are not fully monitorable, and different people with similar condition have different optimal expenditures, at least as best as the insurance company can determine11. If people have "too much" health insurance, they may have an incentive to

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11 There is some moral hazard in the markets for house and vehicle insurance. But unlike the consumption of too much health care, these actions are crimes, with penalties that may greatly exceed the value of the asset. It is harder to attribute them to behavioral choices. There is no market value for the human body and no possibility of abandoning one that is worn out and acquiring a new one.
use “too much” health care at too high prices. Unfortunately the difficulty of judging health care risks and the impossibility of placing a value on a living body makes it impossible to determine how much is “too much” in health care and HI (WDR, 1993). Two types of control are typically used to minimize moral hazard such as demand side and supply side policies:

Demand side measures attempt to control a patient’s demand through financial penalty in the event of an insurance claim by using Co-insurance, Deductible, Pay out limits and No-claims bonus. Insurers also use non-financial control techniques to verify that treatment given is appropriate, effective and cost-effective. Supply side policies are mostly used as state control on the overall level of expenditure and access to services through limitations on the number of doctors, hospital beds and medical technology using regulatory and bureaucratic controls. But these measures are not in the best interest of health care.

Significant effects of insurance on the demand for health services (moral hazard) have been found in the literature (Newhouse, 1993; Cameron et al., 1998; Bertranou, 1998). The usual finding is that those who voluntarily purchase HI have a higher health risk than an average individual in the population, and consume more health care services than if they were not insured. Empirical evidences show that both moral hazard and demand inducement are quantitatively important.

The RAND Health Insurance Study was one of several social science experiments conducted under federal government auspices in the 1970s to learn more about how insurance affects demand for health care (Newhouse, 1993). This study basically followed standard “laboratory” experimental design methods where a total for 5,809 enrollees was chosen from four US cities and two rural sites. By giving different option of health

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12 Co-insurance - A percentage of the charges for medical care specified in the policy, that the beneficiary must pay.
Deductibles - Insured pays a fixed amount of the cost.
Pay out limits -- insurance company pays no more than an established amount.
No-claims bonus — no (or small number of) claims in a year results a reduction on the cost of next year’s policy.
13These techniques are generally known collectively as ‘managed care’ and encompass both financial incentives for providers - such as capitation funding for institutions and individual physician bonuses/penalties - and management of clinical activity - for example utilization review, physician audit and drug formulations.
insurance plan with different copayments for the selected people, the
study inferred that HI coverage leads to over-utilisation of health care at
various degrees as according to the types of health care goods. Emmett B.
Keeler and John E. Rolph (1988) analyze claims data from the RAND
Health Insurance Experiment, which were grouped into episodes of
treatment. The insurance plans in the experiment have coinsurance and a
cap on out-of-pocket spending. Using new statistical techniques to adjust
for the increased sickliness of those who exceed the cap, the effects of
coinsurance on cost per episode and number of episodes are estimated.
Cost sharing reduced the number of episodes but had little effect on cost
per episode. People in the experiment responded myopically as their
current insurance status changed through the year. The price elasticity of
spending was about -0.2 throughout the range of coinsurance studied.

Cameron and Trivedi (1991) within the framework of inter-temporal (two-
period) utility maximization under uncertainty, pointed out that in
Australia, in the initial periods, individuals (or family groups) choose the
health insurance plan, without knowledge of the health status, which will
determine their demand for services during the period to follow.
Individuals choose a health plan and make utilization decisions so as to
maximize expected utility.

To estimate the over-utilization, Claudio Sapelli and Bernardita Vial
(2003) compared the utilization of health care services with public and
PHI by the dependent and independent workers with and without
insurance in Chile. There is a difference in premiums in public and
private insurance policies of the Chilean health insurance system. Public
insurance sets premiums as a percentage of income, while private
insurance uses risk rating. In Chile, law allows private insurance
institutions, to adjust premiums according to age, sex, and number of
dependents. Based on the 1996 CASEN survey, the study found that
utilization of services by the non-insured is almost always lower than
utilization by the insured. The study inferred that this might be due to
differences in costs, moral hazard, or self-selection based on observable or
non-observable characteristics. As expected, utilization increases with
illness. There is no clear relationship between income and utilization of
medical services; utilization among insured workers decrease with income, but among non-insured workers it increases.

In the above-mentioned Chilean study, the dependent variable is the number of services (physician visits and days of hospitalization) consumed by the household head during the three months preceding the survey. The choice of HI is made by the household head, and is assumed to have been made prior to the 3-month period in question. To estimate the utilization equation, the study used count data model, since the dependent variables are discrete. The empirical model allowed for different marginal effects in different population segments; and corrects for self-selection of individuals in health insurance decisions, since the choice of health plan is endogenous. The model to explain the quantity of services consumed in the insurance plan $j$ takes the form:

$$E[y_i /d_{ji}, e_i] = \exp (\beta x_i + e_i)$$

Where $y_i$ is the number of services consumed by the family unit $i$, $d_{ji}$ the dummy variable with a value of one if insurance plan $j$ is purchased, $x_i$ the vector of characteristics of family unit $i$, and $e_i$ is the heterogeneity component in the count equation. The expected value of over-utilization associated with the purchase of health insurance is the difference between (i) the expected number of services consumed by individual $i$ after purchasing the insurance, and (ii) the expected number of services which this individual would consume if he/she had not purchased health insurance:

$$\text{Moral hazard (insurance)} = E(y_i / D_i = 1) - E(y_N / D_i = 0)$$

Where $y_i$ is the utilisation with insurance, and $y_N$ the utilisation if non-insured; $D_i = 1$ for individuals who had purchased health insurance (and $D_i = 0$ for uninsured individuals).

The probability of purchasing health insurance is greater for families with higher income, young children, larger household size, and more
education; and when the household head is older, female, and contributes to a pension saving account. A higher income, younger age, smaller number of dependents, residence in urban area, higher educational level, and employment in a larger company, all these increase the probability of choosing private insurance. The finding that older age and more dependents positively affect affiliation to the public insurance indicates the presence of self selection against public insurance based on observable risk variables. All these results agree with previous work in the area (Sapelli and Torche, 1998). The study revealed that insured workers consume more than twice the quantity consumed by non-insured workers. While considering private and public insurance beneficiaries separately, it was found out that moral hazard is larger in case of public insurance. This result is consistent with the fact that independent workers who purchase public insurance have access to almost complete coverage in physician visits, but in the private insurance sector co-payments are usually different from zero. For hospitalization days moral hazard is not significantly different from zero, a result consistent with much lower price elasticity of demand for hospitalization than for physician visits. In short, there is no over-utilisation in the case of hospitalization, for either public or private insurance.

Bertranou (1998) studies the relationship between utilisation of outpatient health care and HI in Argentina. His results are similar to the Chilean study. For working people without mandatory insurance he finds higher utilisation among the insured (45% above average utilisation) using an OLS regression. When he uses two stage least squares to account for the endogeneity of the dummy variable for HI, he finds an even higher utilisation among the insured.

With rare exceptions, the provision of actuarially fair HI tends to substantially increase the demand for medical care by redistributing income from the healthy to the sick (de Meza, David, 1983). This suggests that previous studies, which attribute all the extra demand for medical care to moral hazard effects, may overestimate the efficiency costs of HI.
Stephen H. Long (1998) in his paper provided a test of the hypothesis that people shift their consumption of health services to time periods when they have more generous insurance coverage, in order to take advantage of third-party payment. Data from the Survey of Income and Program Participation is used to compare utilization rates for people in transition between being insured and being uninsured to those who are continuously insured and continuously uninsured. The study found little support for the hypothesis that people anticipate changes in their insurance status and arrange their health care consumption accordingly.

It has been observed that choosing optimal HI coverage involves a trade-off between the gain from risk reduction and the deadweight loss from moral hazard. Willard G. Manning and M. Susan Marquis (1996) examined this trade-off empirically by estimating both the demand for HI and the demand for health services. The study relies on data from a randomized controlled trial of cost-sharing effects on the use of health services and on the health status for a general, non-elderly population.

Using the Egyptian Household Health Utilization and Expenditure Survey (1995), Winnie Yip and Peter Berman (2001) had shown that the School Health Insurance Program (SHIP) of Egypt significantly improved access by increasing visiting rates and reducing financial burden of use (out of pocket expenditure). With regard to the success of targeting the poor, conditional up on being covered, the SHIP reduced the differentials in visit rates between the highest and lowest income children. However, only the middle-income children benefited from reduced financial burden (within group equity).

2.5. Demand for Health Insurance

The motivation behind people going for HI has been explained, from time to time, by the scholars in various ways. Daniel Bernoulli in 1938 postulated that an individual derives different levels of satisfaction or utility from different levels of income (or wealth). Given a specific concave utility function and a specific insurance problem, he derived the conditions under which the utility level achieved after paying the
insurance premium exceeded the expected utility level from remaining uninsured, and suggested that insurance was purchased because people were maximizing expected utility. The cardinal measurement of utility function by John Von Neumann and Oskar Morgenstern in 1944 made it possible to measure the shape of the expected utility function and to predict how individuals with variously shaped utility functions would respond to the opportunity to purchase insurance. Shortly thereafter, Milton Friedman and L.J Savage (1948) stated that consumers purchase insurance because they prefer a certain loss to an uncertain loss of the same expected magnitude, and concluded that the consumer is “choosing certainty in preference to uncertainty”. Kahneman and Tversky (1981, 1986, and 1988) through the prospect theory with the support of empirical evidences argue that the opposite is true namely, that consumers actually prefer an uncertain loss to a certain loss of the same magnitude. John Pratt (1964) and Kenneth Arrow (1965) separately developed a statistic of curvature of the consumer's utility function, a measure at each level of income, Y, is r(Y) = -U''(Y)/U'(Y), that became the measure of the relative risk averse ness of the individual consumer. Risk aversion and uncertainty about future health creates a demand for HI (Arrow, 1963; Phelps, 1975). Kenneth Arrow (1963) argued that if consumers were 'rational expected utility maximizers', and 'risk averse', and charged actuarially fair premiums, the case for health insurance is "overwhelming."

Since the advent of Mark Pauly's (1968) influential article, almost many health insurance economists believed in a theory that implies that the voluntary purchase of HI makes the consumer worse off. Empirical calculations based on this theory have borne this out. These studies have implicated that consumers are worse off with HI contract with the features of coinsurance rates, deductibles, and limits on out of pocket spending. As against the conventional theories of demand for HI, a recent theory by John A Nyman (2003) suggests that consumers who voluntarily purchase unsubsidized HI are better off. And also, this theory rejects as unnecessary the decidedly unintuitive approach to understanding the purchase of insurance based on the utility function developed in 1944 by John Von Neumann and Oskar Morgenstern. HI transfers income from
those who purchase insurance and remain healthy, to those who purchase insurance and become ill. Thus, the decision to purchase insurance is essentially a comparison of 1) the expected utility lost from paying premium when healthy, and 2) the expected utility gained from the income transfer if ill (Nyman, 2003). While trying to understand the motivations behind buying HI, one caution has to be made here that all these theories are adaptable to developed countries context.

The access value of insurance as a motivation for purchasing HI has gone largely unrecognized in conventional theory. Accordingly, the access value theory of health insurance proposed (Nyman, 2003) the main motivations for purchasing insurance is that desire to gain access to those health care services that would otherwise be unaffordable. For example, although a US$300,000 procedure is unaffordable to a person with US$50,000 in net worth, access is possible through insurance because the annual premium is only a fraction of the procedure's cost. The value of insurance for coverage of unaffordable care is derived from the value of the medical care that insurance makes accessible.

In many developing countries, specifically in India, where access to health care services is restricted due to low level of ability to pay, the access value theory of HI has more policy relevance. Indeed, in India, HI has begun to accept as a mechanism to extend health care security to the poor, and reaching consensus to the principle of "access to health care through access to HI".

Consumers differ in terms of the amounts and types of HI coverage they buy, and these differences are reflected in such items as deductible amount, the coinsurance rate, and the number of sickness events covered. Some consumers purchase HI plans that offer first-dollar coverage for all types of medical services, including routine care. Others purchase HI plans with large deductibles and co-payments that cover only catastrophic illnesses. Difference in health care coverage can be explained by a host of factors, including the price of obtaining health insurance, the individual's degree of risk aversion, the perceived magnitude of the loss
relative to income, and information concerning the likelihood that an illness will accurately occur.

Through a regular telephone survey in Ireland, responses were obtained from 2620 individuals randomly selected from the Electoral Register, as according to the study by C. Harmon and B. Nolan (2001)\textsuperscript{14}, reason for having insurance, almost everyone with insurance regards 'being sure of getting into hospital' and 'fear of large medical or hospital bill' as either very or quite important. However, 'being sure of getting good treatment in hospital' is also regarded as very or quite important by almost all the insured.

### Table 2.2 A summary of the reasons for having health insurance in Ireland

<table>
<thead>
<tr>
<th>Reason</th>
<th>% Saying very important</th>
<th>% Saying very or quite important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being able to have a private or semi-private room in hospital</td>
<td>27.8</td>
<td>65.2</td>
</tr>
<tr>
<td>Being able to choose your own consultant</td>
<td>52.7</td>
<td>88.9</td>
</tr>
<tr>
<td>Being sure of getting in to hospital quickly</td>
<td>86.4</td>
<td>98.6</td>
</tr>
<tr>
<td>Being sure of getting good treatment in hospital</td>
<td>77.4</td>
<td>95.9</td>
</tr>
<tr>
<td>Being able to get in to private hospitals</td>
<td>27.2</td>
<td>63.3</td>
</tr>
<tr>
<td>Being sure of getting consultant care</td>
<td>67.5</td>
<td>96.0</td>
</tr>
<tr>
<td>Being able to arrange hospital treatment for when it suits you</td>
<td>68.7</td>
<td>95.7</td>
</tr>
<tr>
<td>Fear of large medical or hospital bills</td>
<td>88.5</td>
<td>98.4</td>
</tr>
</tbody>
</table>

Further, the study analyzed with a probit model, the choice of the individual whether to buy private insurance or not. The explanatory variables include a number of individual characteristics, such as age, sex

\textsuperscript{14} In Ireland, those with insurance generally received 'private' care in private or semi-private accommodation, and choose their own consultant, but much of this private care is delivered in public hospitals. In Ireland, the health care delivery system comprises of both public hospital and private hospital, which is somehow similar to Indian situation.
and marital status; household composition in terms of the number of children, adults and elderly persons; family income levels and health status variables. The summary of the results of the study is as follows. Specification-A includes only personal and household characteristics. The overall predicted probability of being privately insured on the basis of the mean values of the data is 35% - very close to the actual figure in the sample. The expected probability of choosing private health insurance is dramatically different between the below median income (17%) and above median income (48%) groups. The individual characteristics such as higher levels of education and higher levels of attainment are highly significant in the probability of being insured. Both age and gender are statistically significant determinants of the demand for insurance - older respondents have lower probability of choosing private insurance, while women appear to be more likely to be insured than men. In Specification-B, the disposable income of the household is included as an additional explanatory variable – all of the principal results in the specification-A remain, whereby higher income is associated with an increased probability of choosing private insurance. Under Specification-C, additional explanatory variable is the self-reported health status i.e., very good, good, fair, bad, and very bad. The poorer self-reported health levels are all statistically significant and lower the probability of choosing private insurance. Specification D includes Medical card status as an additional independent variable. This is strongly negatively associated with the demand for HI.

In Chile, the 1996 CASEN survey reports that 60% of the total populations are beneficiaries of public HI, 25% purchase private insurance, 11% have no insurance and the remaining individuals have special coverage schemes. The study by Claudio Sapelli and Bernardita Vial (2003) found that among independent workers, the percentage who purchase insurance increases with income, age and household size, and it is larger for women and for workers who live in urban areas. Among the dependent workers who purchase private insurance increases with income, and decreases with age and household size.
M. Susan Marquis (1995) examined decisions to purchase individual insurance by workers who do not have employment-based insurance. Using data from the Current Population Survey and the Survey of Income and Program Participation, coupled with prices for a standard insurance product in different market areas, the study estimated a price elasticity of -0.3 to -0.4 and an income elasticity of 0.15 and raised doubts that even substantial subsidies to the working uninsured would induce many of them to purchase coverage voluntarily.

2.6. Some Selected Studies on Health Insurance Schemes in India.

Another aspect of the demand for HI is the willingness to pay (WTP) for HI by the people. In WTP for HI studies, respondents were presented with well described but hypothetical situations of buying HI. Several studies in India and abroad reveal that WTP for HI will be affected by sex, age, and years of schooling, income, residence, and health status.

A study by K Mathiyazhagan (1998) about the willingness to pay for a rural HI scheme through people's participation in rural Karnataka suggests that most of the people are willing to join and pay. However, the probability of willingness to join was found to be greater than the probability of willingness to pay. Further, the study reveals that socio-economic factors and physical accessibility to quality health services are significant determinants of willingness to join and pay for such a scheme.

Dror et.al. (2007) provides evidence on Willingness to pay (WTP), gathered through a unidirectional (descending) bidding game among 3024 households (HH) in seven locations where MHI units were in operation in India. Insured persons reported slightly higher WTP values than uninsured. About two-thirds of the sample agreed to pay at least 1%; about half the sample was willing to pay at least 1.35%; 30% was willing to pay about 2.0% of annual HH income as HI premium. Nominal WTP correlates positively with income but relative WTP (expressed as percent of HH income) correlates negatively. The correlation between WTP and education is secondary to that of WTP with HH income.
Household composition did not affect WTP. However, HHs that experienced a high-cost health event and male respondents reported slightly higher WTP. The observed nominal levels of WTP are higher than has been estimated hitherto.

Sodani P R (2001) investigates the community's preferences on various aspects of health insurance. According to the study, quality of care and cost are the two important factors identified by the community as the factors affecting their decision to subscribe to any new health insurance plan. An integrated provider and insurer system is preferred, irrespective of public or private-based management. Hospitalization and maternity services are preferred among the given choices for benefits to be included under the plan. The results also suggest that there is high level of willingness to join a health insurance plan in future if designed carefully for the informal sector.

Another study by Gumber and Kulkarni (2000) conducted in Gujarat State of India explored the availability of health insurance coverage for the poor, especially women, their needs and expectations from a health insurance system and likely constraints in extending current health insurance benefits to workers in the informal sector. The study made a comparative analysis of different forms of health insurance i.e. the ESIS, Mediclaim policy and SEWA, in the informal sector of Gujarat State. They analyzed the comparative advantage of different forms of health insurance in meeting the health care burden of the people in the informal sector and also estimated the demand for and willingness to pay for the health insurance. The households subscribing to Medi-claim generally belonged to the higher income strata and their average annual income was twice that of the households enrolled with SEWA and ESIS as well as that in the non-insured category. The literacy rate is very close to 100 percent for both male and female mediclaim households. They further pointed out that over 92 percent of the non-insured households in both rural and urban areas had no awareness about the existing health insurance schemes. Further, only a miniscule number of households were aware of other insurance plans available in the market.
The IIMA study (1987) for an ADB seminar, based on Maharashtra and West Bengal, reviewed various health insurance schemes, namely, the Sewagram experience in Maharashtra, the Seba co-operative health society in West Bengal, the government owned GIC schemes, the ESIS, and CGHS. The moral hazard and adverse selection are the threat faced by the Sewagram and Seba, as revealed by the study. The study highlighted the poor performance of the mediclaim policy due to 1) even those who can afford the premium are not typically insurance conscious; and 2) the insurance companies have very low priority to the HI business since the HI premium forms a meager portion of their total premium income and hence they would not have followed aggressive marketing strategies.

Bhatt (2000) by studying the Mediclaim policies of GIC’s at the Ahmedabad City revealed that 64 percent of the claimant suffered from non-communicable diseases where communicable diseases still account for 50 percent of the mortality in India and also the average age of the claimant was 29.45 and 43.08 for both the communicable and non-communicable diseases, respectively. The study points out that there is an increase in both the enrolment and claims, and a third of the increases in claims are due to the problem of adverse selection and supplier induced demand.

2.7. Data Sources and Methodology of the present Study

The present study looks into the available HI schemes before the public as a remedy to reduce their health care burden. As it has been noted before there are mainly 3 types of HI schemes, namely, 1) Public (Social) health insurance schemes like CGHS and ESIS, 2) PHI schemes, and 3) MHI schemes. But the Social Health Insurance (SHI) schemes are limited only to some selected people in the formal sector. Thus, the present study considers both the Private Health Insurance (PHI) and Micro Health Insurance (MHI) Schemes as the viable HI schemes for the public in India. The PHI schemes are the HI schemes offered by insurance companies (irrespective of whether the private sector and public sector companies) in the open market in which affiliation into the scheme is not determined by legislation. The MHI schemes are schemes provided by civil society and
other community organization at the grass root level in some selected locations.

2.7.1. Data Sources

There is no systematic data base in India on HI schemes. The secondary information from the providers of both PHI and MHI schemes is not sufficient enough to address the research questions posed in the present study, but it can be used to substantiate some of the research issues. Thus, the information supplied by insurance companies and MHI units is used as the secondary data source for the study. In addition to this, the present study utilized 3 major data sets, namely,

1) Primary Data on Private Health Insurance Scheme (PHI)
2) Household Data on Micro Health Insurance Schemes (MHI)
3) Primary Data on Clients Preferences on Health Insurance Benefits

2.7.1.1. Primary Data on Private Health Insurance (PHI)

Through the primary survey information from both insured and uninsured people were collected. The study has used household (family) as the sample unit because (as argued by the writers like Ngui, Burrow, and Brown (1990)) the health of one family member (income unit) may affect the utility of others. As income is likely to be shared between all members of the family, the financial costs associated with one member seeking treatment will also be shared. As such, the utility of all members of the family may decline in the event of one of the members falling ill.

A multi-stage stratified random sampling technique has been used to select the households for the primary survey. In the first stage, Kerala is used to identify the households. In the second stage, two districts were selected out of 14 districts from Kerala. In the third stage, branches of the four public sector insurance companies have been selected from each of the two districts to identify the insured people.
In the first stage, the state of Kerala had been selected to understand the ground level realities of the nature of voluntary HI in India. In taking one or more state or geographical area as a sample to represent India is a difficult task with its endless diversity in terms of population, climate, topology, religious beliefs, languages, and socio-economic and cultural settings. All these diversified facts have their own role in the health status achievement and the related decision-makings by the population. The Insurance companies providing health insurance schemes have been fairly spread across all Indian States and Territories, and they sell similar insurance policies across the States, and there is no evidence of any kind of sharp and significant difference among all Indian states on the nature of Voluntary HI coverage. The research questions raised and the research objectives stated in the present study allow taking any State or geographical area for selecting the insured people, from the list provided by insurance companies. Moreover, given the time and resource constraints, and the absence of a sound secondary data set for the present study, purposively the state of Kerala has been selected.

In the second stage, two districts were selected out of 14 districts of the state. On the basis of development, the 14 districts of Kerala can be classified as less developed and developed districts. The study covers two districts selected randomly - the first one from among the less developed districts and the second one from among the developed districts. Thus, the two districts, one from the Northern Kerala, i.e., the district of Kasargod and another from Southern Kerala, i.e., Trivandrum have been selected for the household survey. Both the districts are characterized by the presence of urban, semi-urban and rural areas.

In the third stage, samples of the health insured and uninsured households were selected. The insured people were selected from the list provided by the branches of insurance companies in these two districts. It can be seen that the Non-life insurance companies comprising of four public sector and six private sector companies are supplying Voluntary HI in India. These companies are providing a large number of policies in Indian HI market. Among these, the four public sector companies, viz,
NIC, UIC, NIAC, and UIC, occupy a lion's share in the HI market (around 90% of the total share). As against this, the private sector companies are the new entrants to the market and have a very small market share. To add, both the public and private sector companies are under the purview of Insurance Regulatory and Development Authority (IRDA) and these companies have to follow the norms prescribed by the IRDA while developing HI policies. Thus, it can be expected that there will be some uniformity among the various HI policies of all insurance companies. Thus, the study will take the sample of insured people having coverage from the public sector companies. The HI policies (schemes) of the four public sector companies are similar in nature by both title and features. The Mediclaim Insurance Policy (individual and group) of these four companies reflects many features of a standard scheme and many of the standard HI policies of the Private General Insurance Companies follow these features of Mediclaim policy. Thus, the HI schemes of the private health insurance companies such as Health Shield, Basic Health Cover, Tata AIG Health First, and Health Guard are similar to the Mediclaim policy with only slight differences. Moreover, the HI in India is generally equated with the Mediclaim policy and also one of comprehensive one as compared to all other policies. Introduced in 1987, this policy underwent some modification in the subsequent years especially in the upper limit of the insured amount. Furthermore, out of the total HI coverage the Mediclaim policy occupies more than 80% of the market share (IRDA, 2003). Hence, the present study has used Mediclaim policy as the sample space to understand more about Indian HI and people who bought the Mediclaim policy were identified as the insured people, and were interviewed. The list of insured people selected in the financial year of 2003-04 with the aim of getting information from the insured by incorporating the recent developments in the Indian HI market. Moreover, as the HI schemes are renewable in nature on an annual basis, taking the year 2003-04 will automatically cover the people enrolled into the insurance schemes in the previous years also. The sample size of the insured people is 200 that were selected from the Mediclaim Policy enrolment list of the branches of four public sector companies from the two districts. Thus, total 100 insured households from the district of Kasargod and total 100 insured households from the districts of
Trivandrum with 25 households from the list of the Mediclaim Policy of each of the four Insurance Companies were selected as sample of insured households. The sample size of uninsured is 200 households and it was randomly selected from the locations where insured households have been selected. In short, the total sample size is 400 households consisting of un-insured and insured.

Two separate questionnaires were administered for both insured and uninsured, and household heads (decision-makers) were interviewed. Data collection was carried out in August to December 2004. Similarly, peer group discussions were organized with insurance officials with the help of a semi-structured interview schedule.

2.7.1.2. ECCP Household Data on Micro Health Insurance (MHI)

The European Union Cross Cultural Program (ECCP) Project on “Strengthening Micro Health Insurance Units for the Poor in India” has conducted a household survey in seven locations all over India, where micro health insurance schemes are already in place. One of the core objectives of the ECCP Project is capacity building through promoting research on HI in India. Hence, the present study utilized the Household Survey Data provided by the ECCP project. The survey was conducted in the locations of 7 MHI units operating in 4 Indian States, viz, Maharashtra, Karnataka, Tamil Nadu, and Bihar and collected information from both the Health Insured (through MHIUs) and Health Uninsured, hereafter called as Insured and NonInsured. The non insured households are selected from the same location where the insured households are. The total sample size is 4931 households consisting of 2453 (49.7%) insured from MHIUs and 2478 (50.3%) uninsured from the locations where insured people were selected. However, the present study has considered only 5 MHI, they are: 1) YESHASWINI TRUST-Karnataka, 2) KARUNA TRUST-Karnataka, 3) DHAN-Tamil Nadu, 4) UPLIFT-Maharashtra, 5) VHS-Tamil Nadu. Thus, the total sample size is 3523, consisting of the 1755 insured households and 1768 non insured households.
Table 2.3 Number of Households from the locations of Micro Health Insurance Units

<table>
<thead>
<tr>
<th>MHI Units</th>
<th>Insured Households</th>
<th>Non Insured Households</th>
<th>Total Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karuna Trust</td>
<td>352</td>
<td>348</td>
<td>700</td>
</tr>
<tr>
<td>(Karnataka)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yeshaswini Trust</td>
<td>346</td>
<td>354</td>
<td>700</td>
</tr>
<tr>
<td>(Karnataka)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DHAN (Tamil Nadu)</td>
<td>360</td>
<td>362</td>
<td>722</td>
</tr>
<tr>
<td>UPLIFT (Maharastra)</td>
<td>347</td>
<td>353</td>
<td>700</td>
</tr>
<tr>
<td>VHS (Tamil Nadu)</td>
<td>350</td>
<td>351</td>
<td>701</td>
</tr>
<tr>
<td>Total</td>
<td>1755</td>
<td>1768</td>
<td>3523</td>
</tr>
</tbody>
</table>

Source: ECCP Data

Further, the present study classified the MHI schemes as Rural MHI and Urban MHI for convenience of making analysis and interprets the results. The Karuna Trust, Yeshaswini Trust, DHAN are located in rural areas and labeled as Rural MHI units and the UPLIFT and VHS are located in the urban areas and labeled as Urban MHI units. However, such a classification has limitations too. These schemes have different mode and structure of operations. Nonetheless, they differ in the benefit package, level of premium subsidy and the target populations. So interpretations of the results are done as Rural MHI and Urban MHI and also in terms of each of 5 MHI units.

2.7.1.3 Primary Data on Clients Preferences on Health Insurance Benefits (Choosing Healthplans All Together (CHAT-1))

A decision tool called Choosing Health-plans All Together (CHAT-1) was experimented in various locations in India to measure the preferences of the people for HI benefits, which is a modification of the CHAT exercise that was previously designed to allow groups to choose HI packages in the United States. Groups of village members were recruited from the following locations of two Indian states: Karnataka and Maharashtra.
Table 2.4 Locations of the Study Population

<table>
<thead>
<tr>
<th>STATES</th>
<th>LOCATIONS</th>
<th>NUMBER OF HOUSEHOLDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>KARNATAKA</td>
<td>V.P. Hundi</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Madavadi</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Kiragasur</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Banave</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Hiriyuru</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Beedanahalli</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Kempaiahnahundi</td>
<td>24</td>
</tr>
<tr>
<td>MAHARASHTRA</td>
<td>Gokhale Nagar</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Karve Nagar</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Janata Vasahat</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Kashewadi</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Ter</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Wakerwadi</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Dhanegaon</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Chata</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Boramani</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Musti</td>
<td>13</td>
</tr>
</tbody>
</table>

A total of 302 members participated in 24 sessions during November-December 2005. These participants consist of both Micro Health Insured and Noninsured.

2.7.2 Methodology of Present Research

The study makes an attempt to understand the HI mainly from a demand side perspective although considerations have given to the supply side. Thus, the study has used a sample of the insured people from both MHI and PHI schemes. Moreover, a sample of uninsured people also has been drawn from the same locations where the sample of insured people was drawn from. In the study, the insured people of both MHI and PHI are called as 'MHI insured' and 'PHI insured', respectively. In the present study, the uninsured people from the locations of MHI schemes are called 'MHI uninsured' even though they do not have any relation to the MHI Units other than living in the same geographical locations where MHI insured also live. Similarly, the uninsured people from the locations of PHI insured are called as 'PHI noninsured' (or uninsured) people.
The main issue addressed in the study is the scaling up process of HI on an equitable basis and identification of various contributory factors for such an outcome. On a welfare point of view, scale up of HI should also ensure coverage for the poor people too, which may increase the access to health care for the weaker sections of the society. First of all, we analyze the equity aspects of HI coverage. In this regard, the study examines the nature of PHI and MHI coverage to understand whether these schemes have given coverage to the weaker and disadvantaged sections. Therefore, the representations of weaker and disadvantaged sections in various HI schemes are investigated. As the weaker and disadvantaged sections of Indian society are heterogeneous groups, it is difficult to put them under one entity for the sake of analysis. However, they live at their subsistence and belong to the informal sector. One of the common features of these populations is their low level of material well-being. The material well-being of a household can be measured by its annual per capita household income. Hence, in the present study, we define the weaker sections and disadvantaged sections of Indian society as those who have very low level of income. In this context, equity in HI coverage is defined as the situation of having HI for the low-income people.

To understand the equity aspects of HI coverage, the analysis is performed in terms of various groups. The households are classified into 6 categories of income groups on an income scale starting from 'Destitute' to 'Wealthy' based on their annual per capita household incomes. These income classes are again merged into 3 categories as 'Low Income Class Households', 'Middle Income Class Households' and 'High Income Class Households' for further analysis.
Taking a cut off point of income for the classification of the households into the above six categories is a tricky issue. The official estimates (GOI, 2006) state that around 26% of the Indian population lives below poverty line and the cut off point of income has been defined, from time to time, in terms of calories of food. As poverty is understood as a multi-dimensional problem than simply a matter of starvation, the official poverty lines – Rs. 368 and Rs. 559 per person per month for rural and urban areas - are highly unsatisfactory. A recent study by Guruswami and Abraham (2006) estimated the necessary income to lead a normal life and argued that the poverty line in India should be Rs.840 per capita per month. At this expenditure level, nearly 69% of the total and 84% of the rural population lives below the poverty line. However, we do not go for any estimate on defining poverty line for the present analysis, but adopt a simple classification of the population into a range of low income to high income class.

Therefore, for the present analysis, the household data set is re-arranged by sorting the households of the MHI locations in an ascending order on the basis of their per capita household incomes, which has resulted in the ordering of the households from the lowest income class to highest income class. Accordingly, the first 16.7% from the income households are called as ‘Destitute’, and, next 16.7% of the households as ‘Extreme poor’. Similarly, the remaining households are also arranged with intervals of 16.7%. The last 16.6% of the households who belong to the

Figure 2.1 Classification of households into different income classes

- Destitute
- Extreme Poor
- Moderate Poor
- Vulnerable
- Non-Poor
- Wealthy

- Low Income Class
- Middle Income Class
- High Income Class
highest income households are named as 'Wealthy'. These income groups are used for the present analysis. To recall, this exercise is performed on the selected household data set only, and no way related to the population. The outcome from the above classification based on the MHI locations are also applied for sorting the PHI households into different income classes. The following table summarizes the methods of ordering of the households into different income groups.

Table 2.5 Classification of households into various income classes and cut-off points

<table>
<thead>
<tr>
<th>Income Class</th>
<th>Percentage of Households</th>
<th>Income group (in Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destitute</td>
<td>16.7</td>
<td>0-4800</td>
</tr>
<tr>
<td>Extreme Poor</td>
<td>16.7</td>
<td>4801-7200</td>
</tr>
<tr>
<td>Moderate Poor</td>
<td>16.7</td>
<td>7201-9000</td>
</tr>
<tr>
<td>Vulnerable Non-Poor</td>
<td>16.7</td>
<td>9001-12000</td>
</tr>
<tr>
<td>Non-Poor</td>
<td>16.7</td>
<td>12001-17200</td>
</tr>
<tr>
<td>Wealthy</td>
<td>16.6</td>
<td>17201 and above</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>-</td>
</tr>
</tbody>
</table>

The above table shows the income group for each category of population with an interval of 16.7% sample population, starting from 'Destitute' to 'Wealthy'. Accordingly, for example, the 'Destitute' who constitutes the first 16.7% of the population belong to the income group of Rs 0-4800, and 'Wealthy' who constitutes the last 16.6% belong to the income group of Rs. 17201 and above. In the present analysis, we use the above income classification to define various income groups from 'Destitute' to 'Wealthy'.

The extent of equity in HI coverage is examined by comparing the insurance coverage status of MHI clients with the uninsured people of the same locations of each MHI units, and the PHI clients to the uninsured people from the locations from where PHI clients are recruited. And simultaneously, comparison has also been made between various income groups of MHI insured and PHI insured. The HI coverage by income class is analyzed in terms of both inter income class and intra income classes. After investigating the representation of various income groups in the risk
pool by considering the insured households alone, the analysis is extended to understand how the insured populations differ from the non-insured population of the respective location of the HI schemes. It is done by taking the case of both the Insured and the Non-Insured households. The mean income of both the Insured and the Non-insured within each income class is compared to understand the HI coverage within each income class (that is, intra-class). Further, the premium burden of MHI and PHI schemes on households are examined.

Further, the determining factors resulting in equity and inequity in MHI and PHI schemes are examined and analyzed also as factors contributing to the scale up of HI. The determinants of HI coverage (and therefore of the determinants of equity) in MHI schemes are analysed. The significance of various factors such as Level of Education, Household Size, membership status in Self Help Groups/Other Community Organizations (broadly termed as SHGs) membership status and Health Risk on the probability to have HI coverage by each income class in each of the selected MHI schemes are examined. The above mentioned factors are analyzed under the frame of push and pull factors. To distinguish the pull and push factor aspects of household income, the different income classes and their membership status in SHGs are analyzed; first a comparison of the SHGs membership status of the Insured across different income class is done, and secondly, comparisons of the SHGs membership between the Insured and the Non Insured within and across different income classes are performed. The role of education and household size on the decision to buy HI is examined after classifying the education and household size under various income classes. Binary Probit models are used to estimate the significance of both the push and pull factors on the probability to buy HI of households.

After analyzing the determinants of HI coverage in MHI schemes, the analysis is extended to investigate the determinants HI coverage in PHI schemes (and therefore of the determinants of equity). Adverse Selection is an important constraint for Insurers to sell HI schemes. It acts as a factor adversely affecting the scale up process of HI. First the issue of selection bias is analyzed in PHI schemes. In the scale up process of PHI scheme, the income maximizing behavior of insurance agents and its effects on
equity aspects of HI coverage and selection bias in PHI schemes is presented in the form of a simple theoretical model. The analysis is performed in a theoretical frame of asymmetric information with special reference to PHI schemes. The factors contributing to asymmetric information on HI policies are examined by analyzing the level of familiarity of HI and other forms of insurance. In this context, a comparison of different aspects of awareness on different types of insurance in general and HI in particular between the Insured and the Non Insured of the PHI schemes is done. Further, the familiarity of the people with different forms of insurance is measured by comparing the 'Other Insurance enrolment statuses' of both the PHI Insured and the Non Insured. Insurance Agents are the main information dissemination channel for HI schemes. We analyze the role of information asymmetry on HI schemes between the Client and Insurer on the selection bias through his role. In PHI schemes, the role of 'Insurance Agents' in the scaling up of HI and 'Selection Bias' is examined by analyzing utility maximizing behavior of the 'Insurance Agents'. The theoretical model so developed is empirically tested. Both bivariate and multivariate analyses including the Probit regression model are applied to estimate the significance of various factors including 'Selection Bias' affecting the decision to buy HI.

After the investigation of the determinants of PHI coverage, including testing of 'Selection Bias', the analysis is extended to examine the presence of 'Selection Bias' in MHI schemes also. Firstly, it is investigated on whether there is any Adverse Selection or not in each MHI. Thereafter, presence of adverse selection by each income class in each of the MHI scheme is investigated. Moreover, the role of SHGs in 'Selection Bias' is also examined. Binary Probit regression models are used to examine the factors affecting the probability to opt MHI by the people.

Finally, the question whether the prevailing HI schemes are attractive or not has been examined. If the prevailing HI schemes do not reflect the preferences and requirements of the clients, it seems to be unattractive and would lead to low level of health insurance coverage. Therefore, whether the prevailing HI schemes match the preferences of the people or not are investigated. The preferences of the people for various health care
benefits are measured under two situations: 1) Without Budget constraint, and 2) With Budget constraint. The preferences without budget constraint are measured from the responses of those who are willing to pay for health insurance, for which we use the ECCP data. And, the preferences with budget constraint are measured with the help of a decision tool called CHAT exercise (Choosing Healthplans All Together). CHAT is a simulation exercise designed to allow persons to define their own benefit package within constraints of limited resources. Thereafter, we analyze whether the preferences of the people match with various benefits on offer with the available HI schemes in India.