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# Socio economic determinants of health insurance in India: the case of Hyderabad city

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## Abstract

Health has been declared as a fundamental human right in India and several other countries. Theoretical works as well as empirical evidences clearly show the positive linkage between good health and economic development. The policy concern in developing countries including India is not only to reach the entire population with adequate healthcare services, but also to secure an acceptable level of health for all the people through the application of primary healthcare programs. Health insurance is one of the most important aspects of health care management system. This paper identifies the socio economic determinants of demand for health insurance in India taking Hyderabad as the case. For this purpose, a sample survey has been conducted taking 200 sample units in Hyderabad city. The logistic model has been used to identify the determinants of health insurance. We conclude that the main determinants of demand for health insurance in Hyderabad are the occupation, income, health expenditure and awareness. The other variables such as the age and education are positively associated with demand for health insurance but are not statistically significant. In view of these findings, some policy suggestions are made.

**Keywords:** Health insurance, Economic development, Logit model, Income, Expenditure, Awareness

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## **1. Introduction**

Health is an important constituent of human resource development. Good health is the real wealth of society. It not only enhances human efficiency but also leads to a decline in the private and public expenditure on sickness and disease. The human capital model of demand for health (Grossman, 1972) has been one of the major theoretical innovations that have emerged in this regard. This approach provides insights not only into the demand for medical care, but also into the determination of health itself. Healthcare services help to reduce infant mortality rates, check crud death rates, keep diseases under control and raise life expectancy. Improved health contributes to economic growth in four ways (World Bank, 1993). It reduces production losses caused by worker illness, it permits the use of natural resources that had been totally or nearly increasable because of disease, it increases the enrolment of children in schools and makes them better able to learn, and it frees for alternative uses resources that would otherwise have to be spent on treating illness. The economic gains are relatively greater for poor people, who are typically most handicapped by ill health and who stand to gain the most from the development of underutilized resources. Health has been declared as a fundamental human right in India along with several other countries. The policy concern in developing countries including India is not only to reach the entire population with adequate healthcare services; but also to secure an acceptable level of health for all the people through the application of primary healthcare programs. Health insurance can be understood as any form of insurance whose payment is contingent on the insured incurring additional expenses or losing income because of incapacity or loss of good health. It is also known as disability insurance, or medical expense insurance. Health insurance is a type of insurance whereby the insurer pays the medical costs of the insured become sick due to covered causes, or due to accidents. The insurer may be a private organization or a government agency. A health insurance policy is a contract between an insurer and an individual or a group, in which the insurer undertakes to provide specified health insurance benefit to the insured in consideration of a fixed price called premium payable either in lump sum or in installments. Health insurance usually provides either direct payment or reimbursement for expenses associated with illnesses and injuries. The rate of premium charged and extent of cover provided by the health insurance depends on the specific policy bought under the insurance contract between the insured and the insurer. There are several studies among several issues regarding health insurance in India. However, there are very few studies involving econometric models and using survey data. There is no such empirical study in Andhra Pradesh more particularly, for Hyderabad city. The present study is an attempt to fill this gap. We have organized the rest of the paper as follows: in the next section a brief review of literature has been presented; the socio economic characteristics of sample households are presented in the third section; in the fourth section, we present the data and the econometric model; the fifth section deals with the empirical findings; the final section is the conclusion and policy suggestions.

## **2. Literature review**

In this section we review the relevant empirical studies relating to demand for health insurance. Several studies have discussed and debated various experiments for extending health coverage and recommended

micro and macro solution to achieve greater coverage (Ahuja and Narang 2005; Acharya and Ranson 2005; Gupta and Trivedi 2005; Devadasan et. al. 2004a; Devadasan et.al 2004b). Mahal (2002) has examined the entry of private health insurance. He suggested for a comprehensive and long-term perspective at issues of health insurance and health care provision in India. Gumber and Kulkarni (2000) tried to explore the availability of health insurance system for the poor and especially women, their needs and expectations of a health insurance system and the likely constraints in extending current health insurance benefits to workers in the informal sector. Mudgal et al. (2005) and others have tried to verify whether consumption expenditure of households in rural India was insured against medical ailments and have concluded that the villagers were not able to perfectly share the risk of all shocks. Bansal (1999) has examined the status of health care financing in India and concludes that increase in health expenditure is mainly due to salary and non-salary components and not because of higher share of health expenditure in State Domestic Product. Ahuja (2004) concluded that health insurance was emerging as an important financing tool in meeting the health care needs of the poor. Bhat and Jain (2006) have studied the micro health insurance schemes and communities based on health insurance schemes and have concluded that the household income is an important determinant. Bhat and Jain (2007) claimed that the households which have higher health expenditure and income have higher probability of renewing their health insurance policy. Menon (2006) has attempted to explore whether the system can be made to generate better health outcomes, enable participation of civil society, optimize utilization of existing capacities and promote more need based on the development of resources. Srinivasan (2006) has studied about the economics of health insurance in India. The author concluded that the increased public health spending and revamping of public health facilities are must for the success of the community based health insurance scheme in India. Srinivasan and Ponmuthusaravanan (2009) concluded that the income variable had a positive influence over the probability of the purchase of health insurance. Kirigia et al (2005), in their study on developed countries claimed that individual and household level variables are important determinants of health insurance ownership. Nyaman (2002) says that the demand for health insurance is a demand for an income transfer in the event of illness. This income transfer allows those who become ill to purchase more health care and other goods and services than they would if uninsured. Sethi and Bhatia (2009), stated that demand for health insurance in India is due to aggravation of environmental pollution, poisonous gasses, life style changes, difficulties in meeting the cost of medical treatment and hospitalization, government policies and regulations in the form of taxation benefits. In addition, most companies these days are providing the advantage of health insurance to their workforce, thus boosting the demand for health insurance.

### **3. Socio economic characteristics of sample households**

- The age of the respondents sample size is 200, out of 200 samples the respondents between 31-40 age group are highest (38.5 percent), 20.5 are insured between this age group. Because in most of the families the people between this age group are the earners and the entire family depends on them.

- When we look at the gender response, among male (72 percent) 34 percent are insured and 38 percent are non-insured. Among female (28 percent) 16 percent are insured and 12 percent are non-insured. Thus female are less insured compared to male.
- The percentage of insured among SCs (Schedule Casts) (9.5 percent) and STs (Schedule Tribes) (4 percent) is very low. Coming to others, insured are (11.5 percent) more compared to the non-insured. Similarly, among OBC (Other Backward Classes), non-insured are smaller than insured. The reason for less percentage of insured among SC and STs could be due to lack of awareness and due to low levels of income.
- 36 percent of the insured sample households are Under Graduation/Diploma holders (14%). Followed by this, 13 percent of the households are educated up to high school (6.5%) and the rest are post graduates (7%), primary and illiterate categories are only 2%.
- In case of the type of family, the nuclear family (a small family with one or two children) which constitutes 75% of the sample has insurance of only 34.5 percent. Nuclear families are more interested in health insurance compared to joint families.
- Occupations of the respondents show that 34.5 percent of households belong to self employment, among them 14.5 percent are insured and the rest are non-insured (20 percent). And 34.5 percent of households are private employees, among them 19 percent are insured and the rest are non-insured (15.5 percent). Similarly, 6.5 percent are government employees and all of them are insured. Some 24.5 percent households belong to business, among them 10 percent are insured and 14.5 percent are non-insured.
- When we look at the occupation of the respondents, private employees are found to be more insured. The reason is, in the organized sector, the employer will arrange insurance schemes for their employees. The deduction of the premium amount will be deducted from the salaries of employees.
- The annual income of the respondents reveals that 44 percent households get below Rs. 25000. Among them 4.5 percent are insured and the rest are non-insured (40 percent), 29.5 percent of households belong to 25001-75000 income range. Among them 25 percent are insured and the rest are non-insured (4.5 percent). 15 percent of households belongs to 75001-125000 range and among them 10 percent are insured and 5 percent are non insured. As the income increases to Rs.125000, most of the respondents get insured.
- Except for the annual health expenditure of the respondents marked below Rs. 5,000, in all other segments, an over whelming majority has health insurance. A substantial proportion (42.5 percent) of respondents falling in the category of having spent below 5000 have insured, where as comparatively low percent (14 percent) don't possess any health insurance. It is interesting to note that a vast majority (56.5 percent) of respondents are standing below 5000 as the annual health expenditure. As regards the health investment between 5000-10,000 a sizeable number (48 percent) of respondents are insured and 15 percent of respondents are non-insured.
- When we look at the non-insured respondents, some 4 percent are already covered by other schemes (general insurance), 50 percent of households feel that the health insurance policy is too expensive, 15 percent of households are covered by government health welfare schemes (called Arogyasri) and 31 percent households do not like any scheme. And 50 percent non-insured people felt that they were not able to pay the premium and they found it too expensive.

#### 4. The data and the econometric model

The present study was carried out in Hyderabad city of Andhra Pradesh using 2011. Since the main objective of the study was to analyze determinants of health insurance, we concentrated on the variables like age, education, gender, occupation, income, family size, premium of health insurance, health expenditure, awareness, etc. Using structured questionnaire, the primary data have been collected covering the wide range of demographic, economic, and social factors, from the randomly chosen two hundred respondents from the study area. Apart from the primary data, secondary data were also collected from the reports of the Ministry of Health and Family Welfare. The primary data for 200 sample households in Hyderabad city of Andhra Pradesh has been collected during a survey conducted in 2011. We have used logistic regression to identify the factors determining health insurance. The binary logistic model consists of continuous as well as discrete variables which are defined as shown in Table 1.

Table 1: Variable and their Definitions

Variable	Variable Description
<i>Health insurance ownership</i>	=1, if the respondent has health insurance; =0, otherwise.
<i>Age</i>	Respondent's age in years.
<i>Education</i>	Respondent's education level; =1, for matriculation (standard 10 <sup>th</sup> or secondary school) and above; =0, for below matriculation.
<i>Occupation</i>	=1, if respondent is salaried; =0, otherwise.
<i>Income</i>	Total annual income of the respondents in Indian Rupees.
<i>Health Expenditure</i>	Previous year's health expenditure of the respondents in Indian Rupees.
<i>Awareness</i>	=1, if the respondent has awareness on health insurance scheme; and = 0, otherwise.
<i>Age square</i>	Respondent's age square

##### 4.1. Econometric model

To examine the factors determining the demand for health insurance, a logit model has been used in the analysis of individual household's choice between purchasing and not purchasing health insurance. The model uses health insurance purchased among the households as the dichotomous dependent variable. The model uses various socio-economic variables as the factors influencing health insurance purchased.

$$P_i = E \left( Y = \frac{1}{X_i} \right) = \frac{1}{1 + e^{-\left( b_1 + \sum b_k X_{ik} \right)}} \quad (1)$$

$P_i$  = Probability of awareness of health insurance

$b_1$  = constant term

$b_k$  = coefficients

$X_k$  = for  $k = 1 \dots 7$ , are the independent variables and subscript  $i$  denotes  $i$  th observation.

$K_1$  = Age

$K_2$  = Education

$K_3$  = Occupation

$K_4$  = Income

$K_5$  = Health Expenditure

$K_6$  = Awareness on the Health insurance scheme

$K_7$  = Age\_squared

Let

$$Z_i = b_1 + \sum b_k X_{ik} \quad (2)$$

Then

$$P_i = \frac{1}{1 + e^{-Z}} \quad (3)$$

As  $Z_i$  ranges from  $-\infty$  to  $+\infty$ ,  $P_i$  ranges from 0 to 1 and  $P_i$  is non-linearly related to  $Z_i$ .

In estimable form, the model is

$$L_i = \text{Ln} \left( \frac{P_i}{1 - P_i} \right) = Z_i = b_1 + \sum b_k X_{ik} \quad (4)$$

where  $L$  is the logit. It shows how the log odds in favor of awareness of health insurance change as the respective independent variable changes.

## 5. Discussion of empirical findings

To determine the probability of health insurance ownership, the logit model has been estimated as in Table 2. Table 1 shows that R Square is 0.3951, and -2 Log likelihood is -83.859094. The coefficient of the estimated binary logit model measures the impact of a one unit change in an explanatory variable say income on the log

of odds of a health insurance policy ownership, holding other explanatory variables constant. The coefficients for income, health expenditure and awareness on the health insurance scheme are statistically significant at 1 % and 10 % level of significance, respectively, and have positive signs. The later result implies that an increase in any of those variables spontaneously impacts positively on of health insurance policy ownership, holding other factors constant. The coefficient of occupation is statistically significant at 5 % level but has negative effect on the health insurance policy ownership. This may be because of collinearity between health expenditure and salary which is a proxy for occupation. The coefficients of age and education have positive signs and age square has negative sign as expected. However, these variables are not statistically significant.

Table 2: Logistic Regression Model results

Sl. No.	Variables	Coefficient	P> z
1	Age	.0615354	0.591
2	Education	.3078402	0.484
3	Occupation	-.9326314	0.050**
4	Income	.0000632	0.000*
5	Expenditure	.0004492	0.000*
6	Awareness	.7132331	0.092***
7	Age_ square	-.0008932	0.511
8	Constant	-6.310117	0.010*
$R^2$		0.3951	
-2 Log likelihood		-83.859094	
$Prob > \chi^2 =$		0.0000	

\* indicates significant at 1 % level

\*\* significant at 5 %

\*\*\* significant at 10 % level

## 6. Conclusion and policy suggestions

From our study we conclude that the determinants of demand for health insurance in Hyderabad are occupation, income, health expenditure, and awareness on health insurance scheme. These variables

influence health insurance significantly. The variables such as age, education, and age square are statistically not significant though they had expected signs. Therefore occupation, income, health expenditure, and awareness on health insurance scheme play a vital role in determining of health insurance schemes. However, to include some more variables and to draw stronger conclusions, perhaps, a larger sample is needed. This acts as limitation for the present study.

### 6.1. Policy suggestions

Based on our empirical analysis on determinants of health insurance, the following policy suggestions may be made:

1. As health insurance minimizes the burden of health expenditure significantly for a poor household and increases his productivity Governments should come forward in introducing and widening the schemes such as Arogyasri along with the coverage of health insurance.
2. Governments and NGOs should chalk out programs to actively encourage, participate, and spend on promoting the awareness of health insurance particularly among women, SCs & STs and among uneducated.
3. Income, health expenditure, and occupation are being the most important factors, and are positively connected to income; the Governments should aim at generating sufficient incomes to the people through various employment guarantee schemes and through cash transfer methods.
4. There are only some selected hospitals which provide the insurance benefits to the insurer. This reduces the availability of choice to the people insured. To avoid this problem a provision should be made so that all hospitals irrespective of private or public, can provide health insurance benefits to the insurers. This would also encourage people to go for health insurance.

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