
DETERMINANTS OF HEALTH INSURANCE PURCHASE:

AN EMPIRICAL STUDY

Bakshi, Archana

Dr Kanwaljit Kaur

ABSTRACT

Economic development is a multidimensional concept. It encompasses not only economic growth but also improvement in standard of living of the citizens of a country. Hence a superior measure of economic development is an improvement of Human Development Index (HDI) rank rather than increment in GNP. To bring about an improvement in HDI rank (currently 135) India needs to invest in better healthcare system. Health financing models in contemporary world are suggestive of health insurance mechanism through which financial risks due to medical adversities can be pooled. The World Bank report estimated that in India about 300 million persons i.e. about 25% of India's population, had access to some form of health insurance. This low level of health insurance penetration is a great cause of concern. A detailed analysis of determinants of its purchase is required to make it a mainstream of our health financing model. In this study, an empirical analysis of the consumer decision making behaviour for purchase of health insurance coverage is done. The relationship between health insurance purchase and some independent variables like family size, age, sex, income; education, employment, health status, health expenditures and awareness is examined through a binary logistic regression model.

Keywords Health insurance, healthcare financing, health risk, Out of Pocket expenditures

INTRODUCTION

Human Development Index is globally considered to be a good measure of economic development of any nation. It is a composite index of life expectancy, education and income indices. A long and healthy life is an important dimension of it. India's HDI rank was 131 out of 188 countries in 2015 and was ranked behind many smaller countries such as Tunisia, Moldova and slotted in the "Medium Human Development" category, which also included countries like Congo and Ghana. Among our neighbours, the Indian rank was closer to that of Pakistan, Bangladesh and Nepal but far behind Sri Lanka (73rd rank). Further, over the years, India's HDI rank has remained largely static, which raises several questions about Indian health system and living standards.

In absolute terms too, India faces huge challenges related to health status of its citizens. Non-communicable diseases (NCDs) and Cardiovascular Diseases account for 52% of mortality, followed by Chronic Obstructive Pulmonary Disease, Cancer, Diabetes and Injuries. More than 20% of the population is suffering from at least one chronic disease and more than 10% have more than one. Chronic diseases are widespread particularly among individuals who are younger than 45 years and also in case of poor people. Most of these NCDs like Cancer, Diabetes, Cardiovascular Diseases, mental disorders and problems relating to ageing are not only chronic in nature but also have long pre-disease period. Costs borne by the affected individuals and families may be catastrophic as treatment is long term and expensive. (MoHFW, GOI, 2011). Forgia and Nagpal, (2012) estimated that these NCDs accounted for 60 per cent of the deaths in India. The probability of an Indian, in the age group of 30-70 years, dying at present from the four main NCDs -- diabetes, cancer, stroke and respiratory problems is 26 per cent. Risk factors including tobacco and alcohol use, lack of physical activity, unhealthy diet, obesity, stress and environmental factors contribute to high disease burden of NCDs.

Indian health care system is one of the most privatized one. Three fourth of the health expenditures are incurred by the private sector and only one fourth is publicly financed. The total expenditure on health as a percentage of GNP is only 4% ,which is lowest among BRICS nations. With medical inflation the financial burden of health care has significant 'impoverishing' effects on Indian households. This has led many households to incur catastrophic health expenditure (defined as health expenditure that threatens a household's capacity to maintain a basic standard of living). The World Bank Report also revealed that "85% of the working populations in India do not have Rs. 5, 00,000 as instant cash; 14% have Rs. 5, 00,000 instantly but will subsequently will face a financial crunch; Only 1% can afford to spend Rs. 5, 00,000 instantly and easily; and 99% of Indians will face financial crunch in case of any critical illness (<http://www.healthinsuranceindia.org/>)

It is a cause of great concern that poor health can impose huge out of pocket expenses (OOP) that can adversely affect current and accumulated household saving. The pursuit of financial security in case of medical exigencies has led to the evolution of health insurance. Health insurance (HI) protects individuals against catastrophic financial burden resulting from unexpected illness or disability by pooling of resources to cover risks. Health Insurance was defined by Marcinko as "coverage that provides for the payment of benefits as a result of sickness or injury. It includes insurance for losses from accident, medical expenses, disability or accidental death and dismemberment".

India's insurance sector regulator -Insurance Regulatory and Development Authority (IRDA) definition elaborates that "health insurance business or health cover means the effecting of contracts which provides sickness benefits or medical, surgical or hospital expense benefits whether in-patient or out-patient, on an indemnity, reimbursement, service, prepaid, hospital or other plans basis, including assured benefits and long term care".

Health insurance can serve as a good financial instrument of mitigating unexpected medical expenditures and thus bring stability of income. It allows liquidity of funds during medical emergencies for the disabled and sick persons. It maximizes consumer satisfaction by customizing health insurance plans for different needs of individuals. It promotes efficient allocation of resources by ensuring equity in health financing needs. It is beneficial to society as it promotes the habit of saving in the form of premium payments and pools health risks of the citizens. It has great potential to supplement and complement government social security planning and thus play an important role in human capital formation.

The health insurance infrastructure in India covers a very wide spectrum of arrangements. Based on ownership the existing health insurance schemes can be broadly divided into categories such as:

- Government or State-based systems
- Market-based systems (private and voluntary)
- Community based schemes

India has had limited experience in health insurance. Though penetration of health insurance is increasing recently in India, the pace is very slow and much below the expectation (Rao 2004, Ahuja 2005). The World Bank estimated that over 30 crore people, or more than 25 per cent of the population, only gained access to some form of health insurance by 2010, up from 5.5 crore during 2003-04. Hence there is great need for analysing the determinants of the health insurance purchase decision so that pragmatic policy initiatives may increase the penetration of health insurance in India. The present study aims to inquire into the forces that determine Health Insurance purchase decision.

LITERATURE REVIEW

Bawa,S.K. and Ruchita (2011) in their empirical study of 600 respondents observed that only 19.4% were covered by some health insurance scheme and among the uninsured only 11.9% were ready to purchase and another 19.8% only after some conditions are met. They identified seven barriers in the purchase of HI-paucity of funds, low awareness level, poor capability of Intermediaries, limited reliability and coverage, poor availability and accessibility of healthcare services, squeezed policy alternatives and preference for alternative modes of investment. They also identified certain conditions of purchase like comprehensive package and incentive by employers. In addition to this, they found association of willingness to pay for health insurance to be significant with the gender; age; education; occupation and income of the respondent.

Yellaiah,J. and Ramakrishna,G. (2012) in their survey undertaken in 2011 by taking a sample of 200 respondents in Hyderabad tried to identify determinants of demand for health insurance. They constructed a binary logistic model and considered HI purchase as a dichotomous dependent variable .They concluded that the major factors affecting demand were income, health expenditure ,awareness level and occupation. Education and age were also found to be positively correlated with demand but were not found to be statistically significant.

Vellakkal, S. (2013) researched for the determinants for enrolment in voluntary HI schemes in Kasaragod and Trivandrum cities in the state of Kerala, India in 2007-08 .He used mix of qualitative and quantitative approaches for this purpose. He defined insured category in terms of enrolment in a 'Mediclaim Policy' for at least one member of the household with any of the four public sector insurance companies.The logistic regression model was used to measure the association of various factors with enrolment in HI. His result showed significant association with very high income level but not with education or health risk(thus eliminated adverse selection).In contrast to evidence from the developed countries , he found that income is only moderately associated with enrolment in HI.

Mathur,T.et al (2014) tried to estimate the factors that influence respondents' decision to purchase health insurance through an online questionnaire in Lucknow region. They found that socio-economic factors, individuals' product perception and personality traits induces health insurance policy subscription in the region. Age, dependent family members, medical expenditure, health status and individual's product perception were found to be significantly associated with health insurance subscription in the region. Personality traits also showed a positive relationship with respondent's insurance status. They recommended timely claims settlement, transparency in policy guidelines and increase usability of technology for consistent growth of this sector.

Khan, Bharathi and Londhe (2015) used Analytic hierarchy process (AHP), a standard method for multi-criteria decision making, to analyze the exact factors influencing a purchase of private health insurance especially by consumers from low earning groups. Ten expert sales professionals, who had sold specific products to these consumer groups, were presented with a collection of nine important factors which influence buying of private health insurance. Through AHP analysis they were requested to identify and rank the factors which they considered most influential from the point of view of specific consumer groups.Their study indicated that the premium stood out at rank one with customer service standing second and claims settlement history, purpose of buying HI, payment option, policy features and benefits, trust in insurance provider, insurance awareness and brand being the ranking of other factors.

Need of this study-The Union Territory of Chandigarh, (Capital of Punjab and Haryana) in India came into existence in 1966. As per Census 2011, the population of Chandigarh U.T has crossed the one million mark.Of this, 10, 25,682 (97.25%) of its population was urban and 29,004 (2.75%) was rural. The city is among the top by per capita income in the list of Indian States and Union Territories. Chandigarh has always recorded high literacy rate since its inception due to the high quality of educational infrastructure available in the city. With high per capita income



(Rs 130763) and high literacy rates (86.43%), the city of Chandigarh has a Human Development Index of .784 as against the national average of .577. It has been rated as the “Wealthiest Town” of India

The health infrastructure of Chandigarh includes all three levels of healthcare delivery - primary, secondary as well as tertiary. There are 16 sub centers, 52 civil dispensaries offering Allopathic, Ayurveda and Homeopathic OPD medical services, seven Alternative Medical Units, three Urban Primary Health Centers, two 50 bedded Community Health Centers , private nursing homes, One 100 bedded Civil Hospital, one 500 bedded Govt. Multi-Specialty Hospital, one Govt. Medical College and Hospital and one PGIMER.

RESEARCH OBJECTIVE- To identify the determinants of purchase of health insurance policy by households in Chandigarh.

RESEARCH DESIGN AND RESEARCH METHODOLOGY

The present study is a cross sectional study based on household level information collected during a primary survey in Chandigarh. In this survey, primary data was collected through personal interview method using a pre-tested structured questionnaire. For determining the sample size (384), Krejcie& Morgan (1970), table for sample size for finite population was used.

Sampling Technique: Area sampling, a type of cluster sampling was followed in which the sample items were clustered on a geographic area basis. This method is typically used when no current and accurate list of universe elements is available. Out of 56 sectors in Chandigarh households were randomly selected.

A) Research Method-. Using structured questionnaire, the primary data was collected covering a diverse set of demographic, economic, and social factors of the selected households. A Logistic regression was done to study the relationship between purchase of HI and its determinants.

The predicted probability of HI purchase in sampled households of Chandigarh factors can be obtained from the equation:

$$P=1/(1+e^{-Y})$$

Where $Y= \beta_0+\beta_1X_1+\dots+\beta_{11}X_{11}$

This logistic regression model in terms of a generalized linear model can be achieved by taking log odds of the predicted values i.e.

$$Y=\text{Log} [P/ (1-P)] = \beta_0+\beta_1X_1+\dots+\beta_{11}X_{11}$$

Thus, the log odds have a linear relationship. The coefficients of independent variables of the logistic regression model, that is, $\beta_0, \beta_1, \dots, \beta_{11}$ can be estimated using the iterative maximum likelihood method

A situation in which HI is not purchased is given a code “0” and HI purchased cases were represented as “1”.Thus

Y=	Health insurance purchase	=1, if the respondent has purchased health insurance; =0, if the respondent has not purchased health insurance
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Eleven independent variables were identified for the empirical analysis and were named $X_1\text{---}X_{11}$

where X₁: age, X₂: sex, X₃: marital status, X₄: education, X₅: employment, X₆: Size of family, X₇: number of dependents, X₈: religion, X₉: Income, X₁₀: health status and X₁₁: ownership of property, X₁₂: monthly health expenditure, X₁₃: Awareness about health insurance. These variables as defined for the model are described in Table no.1.

Table 1: Variables

S.NO	VARIABLE	DESCRIPTION OF VARIABLE
1	Age	Respondent's age in years
2	Sex	Male-1, Female-2
3	Marital status	Never married-1, currently married-2, Widowed, Separated-4
4	Education	=1, for matriculation =2, for graduation =3, for post graduation or professional
5	Employment	=1, if respondent has a govt job; =0, if respondent has a private sector job =2, if self employed
6	Family Size	Number of Family members
7	Number of Dependents	Upto two-1 Upto four-2 Upto six-3
8	Religion	Hindu-1 Sikh-2 Any other-3
9	Income	Monthly income of the respondents in Indian Rupees.
10	Health status	Excellent-1, Good-02, Average-3, poor-4, very poor-5
11	Ownership of Property	=1, if yes =0, if no
12	Health Expenditure	Monthly health expenditure of the respondents in Indian Rupees
13	Awareness about HI schemes	1-low, 2-average, 3-high.

Method = Forward Stepwise (Likelihood Ratio) Model validation

Table 2

Observed	Predicted				
	HEALTH INSURANCE PURCHASE			Percentage Correct	
	No	Yes			
Step 1	HI PURCHASE	No	22	63	25.9
		Yes	13	288	95.7
	Overall %age				80.3
Step 2	HI PURCHASE	No	22	63	25.9
		Yes	17	284	94.4
	Overall %age				79.3
Step 3	HI PURCHASE	No	25	60	29.4
		Yes	17	284	94.4
	Overall %age				80.1

In a binary logistic model, 80.1%% of the original cases were correctly classified

Table 3:Omnibus Tests of Model Coefficient

		Chi-square	df	Sig.
Step 1	Step	65.252	1	.000
	Block	65.252	1	.000
	Model	65.252	1	.000
Step 2	Step	7.563	1	.006
	Block	72.815	2	.000
	Model	72.815	2	.000
Step 3	Step	7.254	1	.007
	Block	80.069	3	.000
	Model	80.069	3	.000

According to Omnibus tests of model coefficients(Table3), p-value of<0.05 is suggestive of the fact that the forward stepwise (likelihood) procedure of logistic regression is appropriate.

Table 4

		B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1 ^a	Awareness	.107	.015	51.595	1	.00	1.113	1.081	1.146
	Constant	-4.740	.820	33.417	1	.00	.009		
Step 2 ^b	Education	.545	.197	7.634	1	.006	1.725	1.172	2.540
	Awareness	.102	.015	46.142	1	.000	1.108	1.076	1.141
	Constant	-5.787	.922	39.385	1	.000	.003		
Step 3 ^c	Education	.528	.199	7.017	1	.008	1.696	1.147	2.508
	Health_Status1	.448	.174	6.621	1	.010	1.566	1.113	2.203
	Awareness	.108	.016	48.065	1	.000	1.114	1.080	1.148
	Constant	-6.875	1.042	43.542	1	.000	.001		

a. Variable(s) entered on step 1: Awareness.

b. Variable(s) entered on step 2: Education.

c. Variable(s) entered on step 3: Health_Status1.

Out of X_1, \dots, X_{11} independent variables, only three variables, namely, education, awareness about HI and health status were found to be significant ($p < 0.05$). The Wald test clearly shows that there are three significant variables (or predictors), which can predict the purchase of HI. The value of Y can be written as

$$Y = -6.875 + 0.528(\text{Education}) + 0.448(\text{Health status}) + 0.108(\text{Awareness})$$

The three variables chosen by the model show significant changes in the - 2 log-likelihood method as shown in Table which further supports the adequacy of the model. Coefficient of determination (R^2) was computed to check the association of variables in the current model. It is evident from Nagelkerke's $R^2 = 0.288$ value that there is a association of selected independent variables with dependent variables (Nagelkerke's, 1991). The predicted value (P) can be obtained from Equation (1), by substituting the value from Equation (2) after specifying the values of three predictors.

Variables not in the Equation^a

			Score	df	Sig.
Step 1	Variables	Family size	.245	1	.621
		Religion	.191	1	.662
		Income	2.882	1	.090
		Property	.608	1	.436
		Dependents	2.758	1	.097
		Age	1.137	1	.286
		Sex	2.135	1	.144
		Marital Status	1.585	1	.208
		Education	7.842	1	.005
		Employment	1.177	1	.278
		Health Status	7.334	1	.007
		Medical expenditures	6.790	1	.009
Step 2	Variables	Family size	.442	1	.506
		Religion	.085	1	.771
		Income	1.791	1	.181
		Property	.673	1	.412
		Dependents	1.325	1	.250
		Age	.144	1	.704
		Sex	1.161	1	.281

Step 3	Variables	Marital Status	.733	1	.392
		Employment	2.240	1	.134
		Health Status	6.779	1	.009
		Medical exp	5.652	1	.017
		Family size	.365	1	.546
		Religion	.040	1	.841
		Income	1.853	1	.173
		Property	.789	1	.374
		Dependents	2.417	1	.120
		Age	1.471	1	.225
		Sex	1.250	1	.264
		Marital Status	.880	1	.348
		Employment	1.695	1	.193
		Medical exp	1.027	1	.311

a. Residual Chi-Squares are not computed because of redundancies.

Analysis of the above model revealed that the main determinants of demand for health insurance in Chandigarh were education, awareness about health insurance and health status. The variables such as age, family size, medical expenditure, income were statistically not significant though they had expected signs.

There is no doubt that education and awareness about health insurance are logical inferences for health insurance purchase decision. It is only when knowledge about the need and availability of a particular good or service is there that its purchase is possible. A better educated person is likely to be better informed about the benefits of joining a health insurance scheme. This view of the role of education in health decision-making has been well documented by Grossman (1972) and Muurinen (1982). As expected in case of Chandigarh, a high literacy level (86.43%) was supported by high level of awareness (81.3%) about health insurance.

The presence of third significant variable in the list of predictors is health status corresponds to presence of adverse selection—a specific problem of insurance related to asymmetric information. Standard models of adverse selection (Rothschild and Stiglitz 1976) in their work on asymmetric information expected that high risk individuals are more likely to purchase insurance given an equal premium and benefit. Thus the theory of risk has been applied extensively to the literature related to health insurance decision (Arrow 1963; Feldstein 1973). Under conditions of consumer rationality and risk averseness, the decision to purchase insurance is linked to poor Health status of individuals. Under such situations consumers are said to have better information about their health status than the insurance company. They maybe facing greater health risk than others due to their age, pre-existing disease or job profile and thus be more inclined to buy HI. It becomes a challenge for the company to assess the demand for their product. This situation paves way for distortion in setting of premiums and at times makes HI unviable business. This often leads to relatively more unhealthy people buying HI than healthy because they are aware of the fact that their medical expenditures would

definitely be larger than the premium they would pay.

There is a significant body of empirical work that finds evidence of adverse selection within health insurance markets. Finkelstein (2004) found evidence of adverse selection in the Medigap market in the US. Gardiol et al. (2005) in their study in Switzerland found the presence of adverse selection in private insurance market.

Wang et al. (2006) carried out a panel data analysis in rural China and found that medical expenditure for enrolled individuals was 9.6% higher than average expenditure of all residents thus confirming evidence of adverse selection. Wagstaff, (2007); Zhang and Wang (2008); in their experimental studies from developing countries also found enrolment in health insurance program to be linked with chronic condition history, with fair or poor health, thus showing the existence of adverse selection. Similarly, Ito and Kono (2010) found some evidence of adverse selection in a micro health insurance program in India

Policy Suggestions The present study strongly recommends the push factors in terms of creating financial literacy and awareness regarding HI products. Private insurers can take up this responsibility of spreading a word about the need of insurance, setting up distribution and supply channels for the hitherto uncovered population. They can continuously pursue greater media exposure, smarter communication and specific consumer segmentation. Social media, web portals, bundling banking services with HI possess strong potential to increase awareness levels. Advertisements at shopping malls, petrol pumps, railway stations could also serve some purpose. 'Word of mouth' can be a good communicator provided reliability of the product and insurers is maintained amongst the masses. Thus greater volume of purchase decisions would bring effective risk pooling. As far as adverse selection is concerned, private insurers have to bring about smart strategy of health checkups pre-enrolment and on renewal, introduce coinsurance for some diseases and better coordination with the TPAs.

Conclusion

Health insurance is gradually emerging as a financial tool to provide access to good quality healthcare to the Indian people. In spite of the slow evolution of the health insurance sector, its future does not seem to be bleak. Growth has been fuelled through role of government in liberalizing and privatizing this sector. An effort has been made to identify the determinants of Health Insurance purchase so as to provide an explanation of its relatively low penetration levels in India. The results of the logistic regression model used by this study indicate that education, health status and awareness of the product were the main predictors of demand for HI. The study finds some evidence for the existence of adverse selection: households with a poor health status are more likely to purchase insurance.

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