

Issue of Adverse Selection in Health Insurance Market in Assam

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Abstract: Health insurance acts as an important support system, which protects the health as well as the wealth of people. But health insurance is hardly present in developing countries and in many countries it is totally absent. Presence of asymmetric information among the buyers and sellers makes the insurance market more complicated. Due to which insurance companies finds it is difficult to enter into the insurance market and eventually leads to market failure. To get rid of this problem insurance company increased the price of insurance policies. This has more impact on the poor people as they cannot meet their medical expenses. Adverse selection is the one of issues related to asymmetric information. This paper tries to examine the presence of adverse selection in health insurance market in Assam and about the various factors that influence on decision to buy an insurance policy. Based on primary survey this study used a probit model to analyses the presence of adverse selection in health insurance market. Findings of the study shows that adverse selection is absent in health insurance market but income is found to be an important determinant of insurance coverage. About one third of the population in Assam is living below poverty line and the cost of medical is too higher for the people. So health insurance is necessary in recent time to improve the health status of people in Assam. Therefore government should provide health insurance policies for poor people to improve their health status.

Keywords: Health insurance, asymmetric information, adverse selection, market failure, poverty line.

I. INTRODUCTION

Theory of demand for health care by Grossman propagates that the spending made on health care services are investment for an individual, it is not only a consumption expenditure. However, for a poor it is always a tough decision to spend a part of their hard earned money on such expenditure. Expenditure on health cuts poor man expenditure in two ways – firstly their health expenditure increases, secondly they are more affected due to their inability to earn during the period of illness. Finally, they are forced to sacrificed or curtail their basic consumption needs such as food, clothing and other essential needs. Moreover poor people also borrow money at a high rate of interest during the period of illness which pushes them into indebtedness. In India more than 40 percent people, hospitalized in a year, sold their assets or borrowed money to meet medical expenditure (World Bank Report, 2002). Eventually financial burden of health care has become a major problem for the poor people of India.

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Health insurance acts as an important support system, which protects the health as well as the wealth of people. However, health insurance is hardly present in developing countries and in many countries it is totally absent (Ron et al., 1990). Most people are very poor for which they couldn't insure themselves under health care schemes. Thus they have no choice other than spending out of their pocket for the payment of medical expenditure. As per World Health Organization Statistic (2015) it was found that in 2014 almost 89.2% of total expenditure on health in India was made out of pocket. In comparison to India, the status of other developing countries of Asia were 99.6 percent in Afghanistan, 94.5 percent in Bhutan, 95.8 percent in Srilanka, 79.9 percent in Nepal, 92.9 percent in Bangladesh and 86.8 percent in Pakistan. Countries having high HDI index have a low out of pocket expenditure on health care unlikely to those countries with low HDI index. Report from developed countries was 40.2 percent in Netherland, 21.4 percent in USA, 52.7 percent in UK and 29.1 percent in France (World Health Organization, 2017). Every year 7 to 8 percent of the population in India and China falls under poverty due to out of pocket expenditure on health care services (Bansal et al. 2015). Again in India the health insurance policy only cover the hospitalized expenses only not the other medical cost such as outpatient cost. So it fails to protect the poor from health expenses.

The insurance cover in case of Assam also limited. Assam falls in the North Eastern region of India, situated on the south of eastern Himalayas. As per the 2011 census report, literacy rate of Assam is 73.18 percent, out of which literacy rate of male is 78.81 percent and for female is 67.27 percent. In case of poverty, 31.98 percent of the total population of Assam falls under below poverty line (BPL). Health status of Assam shows that, in 2014 life expectancy at birth is 63.9 years which was 45.5 years in 1975. The out of pocket health expenditure is higher in Assam for which poverty in Assam is increasing. There is a huge difference between the out of pocket health expenditure in Assam in comparison to the other North Eastern states. Average out of pocket expenditure in Assam is Rs. 14810, which is greater than the average of North Eastern states of Rs. 8770.88. So increased in out of pocket expenditure is also a financial burden for the people. In this backdrop reducing out of pocket health care expenditure through health coverage is a major concern.

Under such a situation the public health insurance policy can play a vital role in reducing disparities in health in case of socio economic status. In a village without insurance the poor had much higher mortality than the rich, but such disparities were completely eliminated in village with insurance coverage (Sood et al., 2014).

According to the evaluation of the Vajpayee Arogyasree Scheme (funded by World Bank) it is found that mortality rates dropped for individuals with insurance. Mortality rate reduced by 64 percent and out of pocket health expenditure on hospitalization dropped by 60 percent due to insurance due to insurance cover.

Health insurance coverage in Assam has been insufficient and largely limited to small proportion of people in organized sector. According to Vishwanathan (1996), Health insurance is the one of the measures of social security by which members of community are assured benefits of both maintenance of health and medical care when they fall sick. The latest National Family Health Survey (2015-16) states that only 10.4% of household in Assam have a member covered by a health schemes or health insurance. It was only 2.3 percent in 2005-06 in Assam, which was 58.1 percent in Tripura, 34.65 percent in Meghalaya and 30.3 percent in Sikkim.

Government tried to reduce the out of pocket expenditure of poor people through health insurance. But health insurance market fails due to asymmetric information among the buyer and seller. During the process of health insurance, the patient has more information about his health than the insurance company. Asymmetric information creates two problems- one is adverse selection and another is moral hazard. Adverse selection refers to the situation in which the buyers and sellers of an insurance product do not have the same information available. A common example with health insurance occurs when a person waits until he knows he is sick and in need of health care before applying for a health insurance policy. People with higher risk of health issues or sick individuals have more coverage needs, purchase health insurance, while fit and healthy people delay or decide to abstain. The next problem related to health insurance is moral hazard; this arises when people with insurance coverage change their behavior towards health consciousness.

Empirical studies show that for countries like USA, Japan and Switzerland, presence of adverse selection and moral hazard in health insurance leads to overutilization, for which average quality of product gets low. In the context of India also medical overuse emerged as a serious issue, as more people getting access to insurance cover can pay more for medical intervention. Moreover people with private health insurance are two to three times more likely to be hospitalized than the national coverage (Hellinger, 1992). Due to these issues of overutilization, the price of the health insurance policy increased. Therefore due to the presence of asymmetric information the price of insurance policy has raised. This has more impact on the poor people as they cannot meet their medical expenses with low income.

There is a dearth of literature from Assam, especially regarding the existence issue of adverse selection in the health insurance market. This study is modest attempt in this regard to find whether unhealthy people take more insurance than healthy people.

II. OBJECTIVES OF THE STUDY

The following objective drives the present study.

- To examine the issue of adverse selection in the health insurance market in Assam.

To test the adverse selection in the model, present study tests whether the more risky people have more probability to take

insurance policy than the less risky people i.e. healthy people. To assess the more risky and less risky people in the model the self-assessed health status of the people is taken into account. The self-assessed health status are the good health status and bad health status, good are considered as less risky and bad are considered as more risky. If people with bad health take more insurance than people with good health then we can say that adverse selection is present in the model

III. METHODOLOGY

A. Data source

The study is based on primary data. Primary data are collected from Kamrup metro and Kamrup rural district through direct interview with the help of questionnaire. In case of collection the sample, simple random sampling technique is used.

B. Methods

To study the issue of adverse selection in health insurance this study examines the impact of health status on insurance buying decision. If people with poor health take more insurance than people with better health then we can say that adverse selection is present in the model. For this the choice to take insurance policy is taken as dependent variable. The choice of insurance policy took two variables i.e. if a people have insurance policy then its takes value one and zero for other. Since dependent variable is taken as dummy variable so present study use the nonlinear regression model i.e. probit model. The model assumed that choice of insurance by people is determined by his marital status, income, age, sex and his health status. If the poor health status people are more likely to buy health insurance then we can say that adverse selection is present in the model. So the estimated model is as follows.

The empirical model can be expressed as:

$$P_i = P(Y=1/X) = P(I_i^* < I_i) = P(Z_i < \beta_1 + BX_i) = F(\beta_1 + BX_i)$$

Where, $P(Y=1/X)$ means the probability that an event occurs given the values of explanatory variables and where Z_i is the standard normal variable i.e. $Z \sim N(0, \sigma^2)$, F is the standard normal CDF, which can be present as

$$F(I_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{I_i} e^{-z^2/2} dz$$

$$= \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_1 + \beta_2 X_i} e^{-z^2/2} dz$$

The variables used in the model are discussed below

Dependent variable in the model:

The choice of insurance is taken as the dependent variable in the model. It takes two values if people have insurance policy then it takes value one and zero for other.

Where,

Explanatory variables:

The explanatory variables are

Sex:

Males use less medical services than females. So males generally bear more risk than female i.e. female choose more insurance coverage than male (Novi, 2008). So we can expect a positive sign of coefficient for female. In the model sex is taken as dummy variable i.e. it takes two values 1 for male and 0 for others.

Where,
SD=1 for male and 0 for others

Age:
Aged people become ill, when their increase in age. Since illness conditions increase the catastrophic health expenditure of the people, so they are likely to buy more insurance. Aged people like to buy more insurance policies (Resende and Zeidan, 2010).

Health status:
Health status is an important variable for insurance. Person with illness are likely to take more insurance than a person with good health (Resende and Zeidan, 2010). Health status is divided in 2 categories, i.e. good and bad health. So in the model, health status is taken as dummy variable, which takes value 1 for good health and zero for others.

Where,
HSD= 1 for good health and zero for others.

Income:
In the model income is taken as explanatory variable in the model. In order to buy health insurance policy, people need to pay a certain amount in the form of premium to cover their uncertain risk, so in many time, people with low incomes are unable to afford the premium to enjoy such advantage. But people with higher income are able to afford the price of premium, therefore they like to buy more health insurance to avoid the uncertainty which is arises in case of health expenditure. So the rich people buy more insurance than poor people (Zeidan& Marcelo, 2010). In the model the monthly income of the people are taken for analysis and it is expected that people with higher income are more likely to take insurance coverage than people with lower income.

IV. RESULT AND DISCUSSION

A. Estimation of the Model

The existence of heteroscedasticity is a major concern in the application of regression analysis, as it can invalidate the statistical test of significance. For any nonlinear model heteroscedasticity has more severe consequences i.e. the maximum likelihood estimates of the parameters will be biased as well as inconsistent. In the above model chi squared value is significant at 5% level so the null hypothesis is rejected i.e. heteroscedasticity is present in the model. So for estimation the heteroscedasticity should be removed to find an unbiased estimator. The following table shows the estimation after correcting the heteroscedasticity by robust test.

Table I - Estimated coefficient of the binary outcome (probit model):

Variable	Estimated coefficient	Std. error	Z statistics	Probability
Age	-0.005	0.0164	-0.30	0.763
Sex	-2.433***	0.663	-3.67	0.000
Income	0.00007***	0.000	3.47	0.001
Health status	0.2618	0.488	0.54	0.592
constant	-0.9732	0.867	-1.12	0.262
Pseudo R squared	0.54			
LR statistics	15.24			
Probability of LR statistics	0.0042			

Degrees of freedom of 'F' statistics for the testing of overall significance is (5-1), (73-5) = 4, 68

Degrees of freedom of 't' statistics is (73-5)=68.

***=Denotes significance level of 1%.

**=Denotes significance level of 5%

*=Denotes significance level of 10%

B. Explanation and interpretation of the results

In case of binary regression, to test the goodness of fit we cannot use R squared in OLS estimator, so we regress 0& 1 values and not the real value of dependent variable. But for binary regression model a similar measure Pseudo R squared is used. Here Mc Fadden's Pseudo R squared is used in the above table like R squared in OLS, the McFadden also lies between 0 & 1. In the Pseudo R squared is 0.54. So we can interpret that the model is moderately fit.

In case of overall significance of the regression model, the null hypothesis model is that all parameter are simultaneously zero. In nonlinear model we have to test the likelihood ratio which is equivalent to the F statistics in linear regression model. In the above model the likelihood ratio is found as 15.24 with probability 0.0042. So it is highly significant at 1% level and that is why we reject the null hypothesis. Thus we can say that the variables which are adopted in probit model are important determinant.

In the above table sex of the patient and income of the people is highly significant at 1% level so we can say it is highly significant. On the other hand age and health status of the patient is insignificant. From the above result we have seen that the coefficient of income is highly significant and it bears a positive sign. So we can say that individual with higher income are more likely to have health insurance. In case of sex, since the male persons takes value 1 and female takes value 0, so from the sign of the coefficient of sex we can conclude that male are less likely to have health insurance than the female.

In the present study it is found that the explanatory variable age and health status is insignificant. Since health status is insignificant, the null hypothesis should be accepted i.e. there is no significant difference between high risk and low risk people in taking decision about buying insurance policy.

In case of linear regression model we can directly interpreting the estimated coefficient. This is because in the linear regression model the regression coefficient are the marginal effect. But in case of probit model we cannot interpret the coefficient from the output of a probit regression. We need to interpret the marginal effects of the regressors, that is, how much the probability of the outcome variable changes when we change the value of regressors, holding all other regressors constant at same value. Therefore in probit regression, there is an additional step of computation required to get the marginal effect. The following table shows the marginal effect of the regressors'.

Table II - Marginal effect of the regressor

Variable	Marginal effect(dy/dx)
Age	-0.0019
Sex	-0.7734
Income	0.000026
Health status	0.0972



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The above table represents the marginal effect of each explanatory variable at mean. From the above table it is reveal that people with higher income is 0.000026% more likely to take health insurance than people with low income So from the present study it has found that the people with higher income take more insurance than people with lower income.

V. CONCLUSION

Based on the findings of the study various conclusion can be drawn. In the context of Assam, the issue of adverse selection is absent in health insurance. It implies that the preference to buy an insurance policy is same among ill and healthy people. Again another major finding is that people with higher income are likely to take more insurance coverage rather than low income people. In Assam about one third of the population are lives in below poverty line and the medical cost also high for the people. So health insurance is necessary in recent time to improve the health status of people in Assam. Therefore government should provide health insurance policies for poor people to improve their health status.

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