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Issue of health insurance in Assam

Mausumi Das
Research Scholar, Department of Humanities and Social Sciences, IIT Guwahati, Assam, India

Abstract
Most of the time, it has found that the price of insurance policy starts to increase because of the moral hazard issue. People often find it difficult to buy insurance policy due to this increasing price. In case of Assam, health insurance coverage among the people is insufficient. Somehow moral hazard may be the reason behind it. This paper tries to examine the existence of moral hazard issue in case of Assam. For the analysis, secondary data have been used. In the study, it is found that the problem of moral hazard exists in the health insurance market of Assam.

Keywords: Moral hazard, Health Insurance, Expenditure

1. Introduction
Health care expenditure cuts the household budget in two ways. One way is through increasing the medical expenditure, and another way is through reducing the earnings of the household. Due to the increase in the medical cost and reduction of earnings of the household, people have to sacrifice or curtail the consumption of the basic needs like food, clothing, etc. Again to meet the medical expenditure, poor people have to borrow money at a higher rate of interest from money lenders, which lead them to indebtedness. In this situation, health insurance is an essential tool which can take care of the health and wealth of the people. According to Vishwansthan (1996) [10] "Health insurance is the one of the measures of social security by which members of the community are assured benefits of both maintenance of health and medical care when they fall sick". However, in Assam, existing health insurance coverage is insufficient. It is mostly limited to a small proportion of people in the organized sector. The latest National Family Health Survey (2015-16) states only 10.4% of household in Assam have a member covered by health schemes or health insurance. In 2005-06, it was 2.3%, neighboring Tripura in the same survey recorded 58.1%, Meghalaya registered 34.65, and Sikkim 30.3%. If we compare the out of pocket health care expenditure in Assam with the North Eastern region average, we see a huge difference. The total average out of pocket expenditure is found to be Rs. 14810. This is higher than the North Eastern Region Average of Rs 8770.88. So increase in the out of pocket health expenditure is also a financial burden for the people, which lead to an increase in poverty. In this context, to reduce the out of pocket health care expenditure through health insurance is necessary.

Sometimes it is shown that in the case of health insurance, market fails because of the existence of asymmetric information. In the case of health insurance, the patient has more information about his health than the insurance company. This asymmetric information leads to two issues—one is adverse selection, and another is moral hazard. Empirically it is shown that in the case of countries like USA, Japan, Switzerland, these two issues exist in health insurance, which leads to overutilization and the average quality of the product gets low. In India, also medical overuse is emerging as a serious issue, especially as more people can afford to pay for medical interventions due to increasing access to insurance cover. People with private health insurance are two to three times more likely to be hospitalized than the national coverage (World Bank Warning Report, 2014). This overutilization issue may increase the price of the health insurance policy.

There is a dearth of studies on Assam, especially regarding the existence issue of moral hazard in the health insurance market. We aim to fill up the gap in this study. In this paper, we will study whether health insurance leads to the overutilization of health services or not. For this to assess the overutilization length of stay in hospital is to be taken.

2. Literature review
Dave &Kaestner (2009) [5] used longitudinal data from the health and retirement study to observe the behavior of the person, before and after the age of 65. They compare the changes in the behavior of pre to post age 65 of those who were uninsured with the changes in the behavior of pre to postage 65 of those who insured before age 65. By studying this, it has found that for a male person, the ex-ante moral hazard effect is associated with the receipt of Medicare. In case of male 39.7% decrease in the probability of engaging in vigorous physical exercise, 22.7% increase in cigarette consumption, 14.8% increase in the likelihood of daily alcohol consumption, etc. are found for people who insured before age 65 as compared to those who uninsured before age 65. But for female, there is no evidence of ex-ante moral hazard. Stanciole (2008) has also found evidence of ex-ante moral hazard in health insurance. From his study, it is found that health insurance has significant incentive effects on lifestyle choices, increasing the propensity of heavy smoking, lack of exercise and obesity, and decreasing the tendency to heavy smoking.

Imperfect information leads to the overutilization in case of insurance market. From the various empirical evidence, it is found that expenditure of insured people after insurance is increased. The Rand Health Insurance Experiment (RAND, HIE), Anderson & Newman (1973) [1], Paulin & Weber (1995) [8], Joseph (1972) [6], Nguyen *et al.* (2012) [7],

Chiappori & Salanie (2000) [3], Curtis *et al*. (2004) [4], Pauly (2007) [9] etc. empirically shows that moral hazard is present in health insurance. The RAND Health Experiment expenditure empirically found that cost-sharing reduced inappropriate or unnecessary medical care. However, emergency room use involving the less urgent diagnosis was 47% lower on the cost-sharing plans than thee free plan. Anderson and Newman (1956) study indicates a higher level of utilization for insured families or persons as compared to those uninsured. This study shows that uninsured persons exceed insured persons in utilization is in the average stay per admission. But this is offset by the higher admission rates of insured persons. From the survey of 25 Michigan hospitals, it is found that total hospital days involved were 76238 where 11172 were considered unnecessary to the recovery, safety or reasonable comfort of the patient. Paulin and Weber (1995) [8] by using the data of Consumer Expenditure Survey for all families between 1993 January to 1993 December found that the medical expenditure pattern of fully insured, partially insured, Medicaid recipients and uninsured are differ from each other. Joseph (1972) [6] shows the effect of insurance on the length of stay in a hospital. For that author take 22 illness conditions. Out of 22 illnesses condition by using the regression line, it is found that seven categories of illness condition are influenced by insurance. Nguyen *et al*. (2012) [7] using the data of 2004 and 2006 in Vietnam, concludes that health insurance in the number of outpatient visits to state health care providers. Chiappori *et al*. (2000) [3] in French has observed that health insurance has a significant impact on visit. Curtie *et al*. (2004) show the effect of insurance on prescription drug expenditure among the elderly. Data collected from the 1997 medical expenditure panel survey of prescription drug expenditure of aged 65 years and above. They found that on average total drugs expenditure without prescription drugs insurance were 280 dollars less per year than for those with insurance. The average expenditure per prescription was 28% lower for uninsured. On average subject, prescription drug insurance filled six fewer prescriptions than did those with insurance. Pauly (2007) [9] collected the data about the medical spending and health outcome of non-poor young women ages between 21 to 41 and their insurance states from 1996 Medical Expenditure Panel Survey. Health spending measures by money spent on health care and a visit to physician offices or hospitals outpatient department, on the other hand, health outcome measures in terms of whether the person's self-reported health status was fair or poor. By analyzing the data, it is shown that for both the use of medical care and total spending, the people with insurance had substantially more total spending and outpatient visits than the people without insurance

Wang *et al*. (2008) [11] has empirically found that there is a positive correlation between insurance coverage and claims in Taiwan automobile insurance market. This correlation can be reduced through increasing deductible, i.e., moral hazard can be increased through increasing the deductible. Bolhaar *et al*. (2012) [2] have found that the moral hazard is absent and the adverse selection in present in Ireland health insurance market. Their study found that the health consumption expenditure of insured people is not greater than the uninsured people.

From the above literature, it is found that in most of the insurance company hesitate to sell health insurance policy due to the existence of moral hazard issues. After buying a health insurance policy, people may give up doing regular exercise, increase the consumption of alcohol or may visit more time to doctors, etc. In the case of Assam, there are no sufficient attention is given by the researcher in this issue.

3. Analytical framework

3.1 Objectives of the study

The following basic objective drives the present study.

1. To examine the issue of moral hazard in the health insurance market in Assam.

To examine this particular objective, this paper studies the effect of payment by health insurance on the length of stay in a hospital. The length of stay in hospital bed represents the uses of hospital services. If the payment by health insurance has a significant effect on length of stay in hospital then we can conclude that moral hazard is present in health insurance.

3.2 Material and method

3.2.1 Data source

The present study is based on secondary data. Basic secondary data has been collected from discharge data of Marwari Maternity Hospital and Research Centre for the January 2017 to July 2017. The 6 disease and conditions that occurred most frequently in the data were selected for the empirical test.

3.2.2. Line of analysis

Moral hazard leads to overutilization of the services after buying insurance policy. After buying health insurance policy, people may visit more times to doctor or may stay more days at hospital bed. In this study the effect of insurance status on the length of stay in hospital will be analysed.To study the effect of insurance status on length of stay in hospital by the patient will be analyses through multiple linear regression model.

The estimated model:

LSi=f (AGEi, SDi, MSDi, TAD1i, TAD12, ISDi, ICD1i, ICD2i, ICD3i, ICD4i, ICD5i)

Where

Dependent variable

LSi= Length of stay in hospital of the ith patient.

Independent variable:

AGEi= Age of ith person.

SDi=Sex of ith person.

MSDi=Marital status of ith person

TADi=Type of accommodation of ith person. Types of accommodation are a categorical variable. It has three categories, i.e., general, semi-private, and private. So two dummy variables are taken in the study.

ICDi= Illness condition of the ith person. The types of diseases also effect on the length of stay in hospital. So it is necessary to study the effect of different types of diseases on the length of stay. Here six types of diseases have taken in our analyses which are frequently found in the data set. So five dummy variable is taken in the study.

ISDi= Insurance status of ith person

Thus the complete model can be written as

$LSi=\beta i+\beta Zi+ ui$

Where ui is the random error term that satisfies ui~IID (0, $\sigma 2$) and Zi includes LSi, AGEi, SDi, MSDi, TADi, ISDi and

ICDi. Both independent variables and ui are assumed to be independently distributed for all i. βi is a constant specific to all i.

4. Estimation of the model

While dealing with cross-section data, it is most important to test whether the assumption of classical linear regression model valid or not.seen to violate the assumption of the classical linear regression model. For example, estimation done in presence of heteroscedasticity and multicollinearity would be misleading. Therefore present study has tested for the presence of heteroscadasticity and multicollinearity before estimating the models. In the model is found that the heteroscedasticity is present and multicollinearity is absent. So after correcting the heteroscedasticity, the following result is found.

Table 1: Result of linear regression model.

Dependent variable: Length of stay in hospital (Number of days)			
Method: Ordinary least square			
Particular	**Estimated Coefficient**	**Standard Error**	**t value**
Constant	3.982***	1.175	3.39
Age	-0.011	0.017	-0.63
Sex	0.001	0.713	0.00
Marital Status	-0.655	0.950	-0.69
TAD_1	3.056***	1.018	3.00
TAD_2	0.894	0.578	0.15
Insurance Status	2.609***	0.764	3.41
ICD_1	-0.781	1.058	-0.74
ICD_2	2.472*	1.457	-1.70
ICD_3	2.413	3.758	0.64
ICD_4	-0.094	0.716	-0.13
ICD_5	-0.965	0.871	-1.11
R^2	0.426		
F	6.95***		

Degrees of freedom for t' statistics to test the significance of individual coefficient =84-12=72
Degrees of freedom of 'F' statistics for the testing of overall significance is (12-1), (84-12) =11, 72
***=Denotes significance level of 1%.
**=Denotes significance level of 5%
*=Denotes significance level of 10%

5. Explanation and interpretation of the results

In the model almost 42% of the variance in the dependent variable (length of stay) is explained by the estimated model. This is called moderate fit. Though R2 value is low because the diversity of the cross sectional units. So it is better to check the individual significance of the regressor's. The overall significance of the given by respective 'F' statistics which is found to be higher significant i.e. 1% level of significant. So we can conclude that there is significant impact of regressor on regressend. Based on the values of R square and 'F' statistics, it can be concluded that model provide significant explanation of length of stay in hospital.

In the model the intercept term is highly significant. Highly significant intercept term is not good indicator because we have excluded some important explanatory variable in the model. However, this exclusion is unavoidable in this regard, there are some variable in the model which have to be excluded because of lack of data.

From the regression model, it is observed that the' statistics for estimated coefficient of insurance status is significant at 1 percent level, i.e., it is highly significant. So we reject the null hypothesis and accept the alternative hypothesis. This implies that insurance status has a significant impact on the length of stay in hospital of the patient. The coefficient of insurance bear a positive sign, i.e. it implies people with insurance policy used to stay more day in hospital compare to uninsured people. Again the't' statistics of estimated coefficient of TAD1 has also significant at 1% level i.e. it is highly significant and also the estimated coefficient bears a positive sign. TAD1 is a dummy variable in the model used to explain the type of accommodation. Its takes value 1 when it is private and 0 for others. So from the model it can be concluded that people stay more days in hospital if they are admitted in private room rather than semi private room and general ward. The explanatory variable ICD2 is also significant at 10 percent level. ICD2 is a dummy variable taken for illness condition which takes value 1 for jaundice and zero for other. From the result we can interpret that in case of jaundice people stay more time in hospital than in on average of hospital stay.

In the model the in case of other variable such as age, sex, marital status, TAD2, ICD1, ICD3, ICD4, ICD5, effects are insignificant. So from above analysis it is found that age, sex, marital status of the patient do not effect on how many days a patient stay in hospital bed. Again TAD2 is insignificant, where TAD is a variable which takes 1 for semi-private room and 0 for others. So there is no difference in case of length of stay in case of a patient who is staying in semiprivate ward with others type of accommodation. In case of illness condition such as fever pneumonia, sugar, anemia, and appendices people do not stay more day in the hospital.

The objective of the present study was to find out the effect of insurance status on length of stay in hospital. From this study, it is found that insured people stay more days in the hospital rather than uninsured people. In the present study with the help of this objective, it can be clearly said that insured people use more medical services than uninsured people i.e. moral hazard present in case of health insurance.

6. Conclusion

Based on the findings of the study various conclusion can be drawn. In the present study moral hazard is significant in health insurance market. In this study, only the demand side moral hazard is studied. It has found that the insured people use more medical services than the uninsured 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 for recent time to improve the health status of people in Assam. But in recent time premium are increases in every year, so it is difficult for the poor people to getting the insurance coverage. The main reasons for increasing premium are the inflation in medical-related product and issue of moral hazard. From the present study it has found that moral hazard is present in the insurance market in Assam. That is why the moral hazard issue should be reduced.

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