Original Research Article

Impact of Publicly Funded Health Insurance Scheme and Risk Coping Strategies Against Health Expenses in Kerala

ABSTRACT

Aims: The objective of the paper is to understand the role of publicly funded health insurance schemes in helping poor households to come out from expensive coping strategies such as borrowing and sale of assets against health expenses in the state of Kerala, India.

Study design: Cross-sectional study.

Place and Duration of Study: The study used data collected from a primary survey in the Palakkad district of Kerala. Duration of the study period is between January 2018 to January 2019.

Methodology: A total sample of 408 poor households including both insured and uninsured were collected in a primary survey using a structured schedule. Probit and log-linear regressions were employed to understand the impact of insurance coverage for the poor on risk coping strategies such as borrowing and sale of assets.

Results: Probit regression results showed that uninsured households have around 32% higher probability of borrowing (P value-0.003) compared to insured households where as sale of assets as a coping strategy did not yield any significant results.

Conclusion: Results showed a negative significant relationship between insurance coverage and risk coping strategy of borrowing. The amount and probability of borrowing were found significantly lower among insured households for inpatient care. But the sale of assets did not have any significant impact from the insurance coverage.

Keywords: Risk coping strategies; Publicly funded health insurance; Borrowing; Sale of assets; Health shock; Health expenses.

1. INTRODUCTION

One of the most common economic shocks faced by the poor is the health shock. Health shock is considered to be idiosyncratic in nature which deteriorates the health condition or death of a household member. Unexpected illness is found to have adverse long and short term economic impacts especially for the poor in developing countries [1,2]. There are evidences that health shocks even push households into poverty and also deepen it [3-5]. Households depend on different coping strategies for smoothing their consumption when they face any kind of income shocks.

Lack of proper safety net mechanisms and huge dependence on out of pocket expenditure to pay for health care expenses lead households to depend on expensive and distressing coping strategies such as borrowing and sale of assets [6]. These strategies not only cost additional expenses but also increases the vulnerability in future against any economic shock [7,8]. India is not an exception to the high share of out of pocket expenses and poor spread of insurance coverage. According to the latest reports of National Sample Survey on health, households in India largely depend on ex post measures of coping mechanisms such as savings, borrowings and sale of assets to cope with out of pocket expenditure [9]. The lack of collateral or other securities results in the poor depending on the easily available sources such as borrowings from friends and relatives or money lenders. Though high interest rates pose a big challenge for them to repay the loans, poor are left with no option but to borrow from them to meet unexpected expenses. This results in poverty deepening and falling into the debt trap. To reduce financial risk from health expenditure, Government introduced a nationwide publicly funded health insurance (PFHI) scheme in India with an objective to protect the poor. Publicly funded health insurance scheme for the poor was introduced with the objective of increasing health care utilisation and financial protection. Financial protection indirectly ensures less reliance on distress coping strategies and improved welfare of households. The impact of PFHI schemes on financial protection in terms of share of out of pocket expenditure, catastrophic expenditure and utilisation are extensively studied [10-12]. There is a scarcity of impact studies of PFHI on coping strategies such as borrowing and sale of assets which are expensive and distressing in nature, in India. Therefore, the objective of the paper is to understand the role of publicly funded health insurance schemes in helping the poor households come out from expensive coping strategies such as borrowing and sale of assets against health expenses in the state of Kerala, India.

1.1 Review of literature

Use of high share of out of pocket expenses to cope with health shocks can result in huge economic impoverishment [13,14]. A study on low and middle income countries have found that poor have higher financial risk of hardship financing due to poor access to health services and credit [6]. Health insurance coverage as an ex ante measure is suggested by various studies to overcome the ill effects of health shocks. Dekker and Wilms studied the risk coping strategies in Uganda and found significantly lower frequency to use sale of assets as a coping strategy among micro insurance holders using probit and ordinary least square regression analysis [15]. Babiarz et. al also brought out the importance of health insurance coverage by statistically confirming that chances of reliance on unsecured debt is 26% higher among uninsured households than insured in the United States [16]. The average outstanding debt also increased by more than 42% among uninsured. The

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study focused on the impact of adverse health events on the use of unsecured debt using fixed effect logistic regression and long term impact using fixed affect least square method.

In India, impact studies of health insurance on coping strategies are largely limited to the micro health insurance schemes limited to certain regions. Aggarwal studied the impact of a community health insurance scheme in Karnataka on utilisation and financial protection using difference in difference method. The results showed that insured are better financially protected and depended less on borrowing or sale of assets to meet surgical health expenses [17]. Similar results were found by Savitha and Kiran in an impact study of micro health insurance on coping strategies in Karnataka, India [18]. The study brings out the significance of insurance coverage in reducing the probability of using borrowing as a coping strategy. Study used a probit and logit regression to examine the relations. Usage of other coping strategies was not affected by the insurance coverage. The same programme was studied to analyse its impact on the usage of informal credit to cope against illness. A significant reduction in the dependency on usurious credit among the insurance holders was found [19]. The literature review brings out the fact that health insurance coverage has a potential to protect households from using hardship financing when faced with health shocks. Also shows the gap in literature in analysing the role of PFHI scheme which was introduced nationwide to protect poor from financial risks. Therefore the study analyses the impact of PFHI schemes on hardship coping strategies in a case study of Kerala.

1.2 Publicly funded health insurance scheme

Publicly funded health insurance schemes are the government sponsored schemes where a third party insurance company is the insurer for the poor households. Government bears the premium charge for those enrolled. Rashtriya Swasthya Bima Yojana (RSBY) and Comprehensive health insurance scheme(CHIS) were the two publicly funded health insurance schemes that were operating in Kerala. The Schemes have changed the terms and conditions and names to Pradhan Mantri Jan Arogya Yojana and Karunya Arogya Suraksha Paddhati with implementation of Ayushman Bharat scheme in India. RSBY was a cashless mechanism which provided an yearly coverage of Rs30,000 for a family of five on a floater basis. It included transportation cost of Rs 1000 for an year with a limit of Rs100 per visit. The coverage also included expenses one day prior to hospitalisation and five days post hospitalisation. Apart from the eligible population of RSBY, CHIS gave additional coverage to the poor who were not included in the central list but in the state list of poverty. Therefore CHIS worked as an extension of RSBY in the state. Both the schemes work together as a single comprehensive health insurance scheme in the state.

2. METHODOLOGY

2.1 Data

Data for the study is collected through a survey in the year 2019 in the district of Palakkad, Kerala. Population of the study includes all poor households in the district. Poverty line used by the government to provide subsidies to households is used as the criteria to identify the poor households. Household is considered to be the basic unit of analysis. Total samples of 408 households including 1,741 members were collected. The sample used for analysis includes both insured and uninsured households who availed inpatient care in the past 365 days. Samples were selected from all 13 community development blocks of the district using simple random sampling. Separate structured schedule were used to collect information from the groups for the detailed information. Total samples were divided into three groups namely the households which are uninsured (86 households), households which used insurance benefits for the first time (206 households) and the ones who used insurance benefits more than once (116 households) for multivariate analysis. This classification not only helps to understand the difference among insured and uninsured but also helps in understanding the difference among first time users and the others. The data is limited to inpatient care health expenses.

2.2 Methods

Bivariate analyses are carried out to check the association between health insurance coverage and other coping strategies. Pearson Chi square test of independence and Kruskal-Wallis test are applied to understand the strength of association of health insurance coverage and the use of other coping strategies. The presence of significant difference in the amount and use of coping strategies among both the groups lead to further detailed analysis by considering other variables. Multivariate probit regression model is used to study the impact of PFHI coverage on the incidence of other coping strategies and ordinary least square regression to understand the impact on the amount of money used from these coping strategies.

Modelling impact analysis of health insurance is prone to the problem of potential endogeneity and selection bias [20]. Endogeneity issues for the health insurance variable arise as the decision to join health insurance by a family may also be influenced by various unobserved factors which can also influence the outcome variable. Therefore perceived impact of health insurance on an outcome variable may not be due to health insurance alone. The presence of these unobserved factors results in over estimating the impact of health insurance on the outcome variable.

To measure the endogeneity of the health insurance variable, one of the methods suggested by Waters is used [20]. This method is adopted by

> **Comment [J8]:** Information on data needs to be more detailed. For instance, state the total population size of the poor household from whiich sample was taken.
> Also, indicate the population size of both the insured and uninsured.

various studies to test the endogeneity of the variable [15,18,21]. To test for the problem of endogeneity, first, determinants for health insurance coverage is estimated through a probit regression. This probability estimation of health insurance coverage includes independent variables from the impact analysis model as well as few other variables which influence the decision of membership in the scheme. The predicted values from the regression are then used as a regressor along with other regressors to estimate the impact analysis model. If the coefficient of the predicted value is significantly different from zero then results indicate that the assumed endogenous variable is endogenous in nature. If endogeneity is proved, probit or logit regression do not yield efficient estimates. The results of the tests of endogeneity are given in the Table 6,7,8 (appendix). For checking endogeneity of health insurance in ordinary least square models instrumental regression is run to test whether health insurance is endogenous. All the test gives coefficients that prove health insurance as an exogenous variable. Indian studies on health insurance have largely ignored the problem of self-selection and endogeneity except few studies.

Two aspects of the coping strategies are considered for analysis. Probability of using a particular coping strategy and the amount of money used from that particular coping mechanism to cover the hospital expenses are considered. The whole analysis is therefore divided into two parts. The first part studies the impact of PFHI on the probability of depending on other coping strategies such as borrowing and selling of assets using a probit regression. Second part of the analysis considers impact on the level of dependence on a particular coping strategy using the amount of money from a particular strategy as the dependent variable. A log linear ordinary least square regression is carried out for the analysis. Fitness and robustness of the models are tested using Hosmer Lemeshow test for the probit model and F test for the log linear model.

General specification of the probit model used for analysis is

$$\text{Prob}(Y = 1|X_1 X_2,... X_n) = \varphi(\beta_0 + \beta_1 X_1 + \beta_2 X_2... + \beta_n X_n) = \varphi(X)....(1)$$

where,

- $\text{Prob}(Y=1|X)$= Probability of using a particular coping strategy given other independent variables
- φ = standard normal cumulative distribution function(CDF)
- X_1= Dummy variable for health insurance coverage for the household
- $X_2,..X_n$ = Control variables used in the model

Regressors used in the models are considered based on the available empirical studies on the impact of health insurance on the coping strategies. Details of the variables used in the models are given in table 1 and table 2 gives the summary statistics of them. Control variables used in the models include individual characteristics, household characteristics and

characteristics at the community level. Individual characteristics of the patient such as age, gender, social groups, religion, education and health status are used. Household characteristics includes dummy variable for MGNREGA participation (Mahatma Gandhi National Rural Employment Guarantee Act is a national employment generation programme ensuring 100 days of unskilled manual work for rural household in India.) from the family, household size, highest educational attainment in the family, number of working members in the family, main occupation of the household, income, dummy variable for incurring catastrophic health expenditure, total expenses of the inpatient care incurred for the household. Colour of the ration card which denotes the different levels of the economic status of the household is also used at the household level. Yellow colour card belongs to Antyodaya Anna Yojana category which are considered highest priority cards for subsidies by the Governments as they are in the very lowest end in terms of economic status. Pink colour card holders belong to priority category who fall in the next higher level after yellow card holders. Both the categories are considered to be the households below poverty line. The community level variables include the place of residence, distance to hospital. The second part of the analysis uses log linear regression to understand whether PFHI is a significant determinant of the amount of money used from a particular coping strategy.

Log linear model is given as

$$Log(Y = amount\ from\ coping\ strategy) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 ... + \beta_n X_n + \varepsilon \qquad (2)$$

Where,

- Y is the log transformed value of amount of money used from a particular coping strategy
- X_1 = Dummy variable for health insurance coverage for the household
- $X_2, .. X_n$ = Control variables used in the model

Table 1: Description of Variables

Variables	Description
Borrowed	=1 if borrowed to pay for inpatient care, =0 otherwise
Amount borrowed	Amount borrowed to pay for inpatient care (Rupees)
Sold assets	=1 if sold assets to pay for inpatient care, =0 otherwise
Amount of sold assets	Amount used for inpatient care by selling assets (Rupees)
Credit type	=1 if borrowed from formal source , =0 if otherwise
Uninsured †	=1 if household is not covered under PFHI scheme, =0 otherwise
First beneficiary	=1 if household received benefits under PFHI scheme for first time,=0 otherwise

Beneficiary more than once	=1 if household received benefits under PFHI scheme more than once, =0 otherwise
MGNREGA participation	=1 if any member of the household works in MGNREGA Programme, =0 otherwise
Total income	Total average monthly income of the household (Rupees)
Household size	Total number of members in the household
No of working members	Total number of working members in the household
Place of residence	=1 if household belongs to rural area , =0 if urban area
Catastrophic health expense	=1 if HH incurred health expenses beyond 40% of their total income, =0 otherwise
Distance to hospital	Total distance to the hospital from the house (Kilometres)
Total health expenses	Total health expenses incurred for inpatient care
Highest education	Highest educational attainment in the household
Type of ration card	=1 if ration card belongs to priority HH (pink), =0 if it belongs to Antyodaya Anna Yojana category (yellow)
Education	educational level of the patient
Health status	=1 if the patient has chronic illness, =0 otherwise
Hindu	=1 if patient belongs to Hindu religion, =0 otherwise
Islam	=1 if patient belongs to Islam religion, =0 otherwise
Christian †	=1 if patient belongs to Christian religion, =0 otherwise
Scheduled Caste	=1 if patient belongs to Scheduled caste, =0 otherwise
Scheduled Tribe	=1 if patient belongs to Scheduled tribe, =0 otherwise
Other Backward Caste	=1 if patient belongs to Other Backward Caste , =0 otherwise
Other caste†	=1 if patient belongs to other caste group, =0 otherwise
Gender	=1 if the patient is female, =0 if patient is male
Age	Age of the patient

†reference category

Table 2: Descriptive Statistics of Variables

Variables	Uninsured (1)	Insured (2)	Total (1+2=3)	Chi Square *P* value(4)
Household Level Characteristics				
MGNREGA participation(%)	55.9	40.6	43.9	0.012
Income (mean standard deviation)	2053.5	1902.7	1934.5	0.25†

Household size(mean standard deviation)	4.15	4.62	4.52	0.06†
No of working members (mean standard deviation)	1.55	1.54	1.54	0.42†
Total expenses (mean standard deviation)	56153.5	6861	17251	0.003 †
Highest education (mean standard deviation)	9.8	10.9	10.6	0.0 †
Type of ration card Priority card(pink) %	79.1	86.0	84.5	0.11
Catastrophic health expense (%)	69.7	18.6	29.4	0.004
Community Level Characteristics Place of Residence Rural (%)	87.2	69.6	73.3	0.001
Distance to hospital (mean standard deviation)	23.9	23.9	23.9	0.33 †
Individual Level Characteristics Education(median)	6.25	6.53	6.47	0.68†
Chronic patient (%)	30.2	30.4	30.4	0.97
Hindu (%)	89.5	78	80.4	0.016
Islam (%)	10.5	19.5	17.6	0.05
Scheduled Tribe (%)	7	3.1	3.9	0.10
Scheduled Caste (%)	30.2	32	31.6	0.76
Other Backward Caste (%)	61.6	62.1	62	0.94
Female (%)	51.2	52.8	52.5	0.79
Age (mean standard deviation)	43.6	45.1	44.7	0.67 †

source: author's calculation

†Kruskal Wallis test

3. RESULTS AND DISCUSSION

3.1 Results

Table 2 shows that both insured and uninsured households do not have any significant difference in terms of their average income, economic level, number of working members and distance to hospital. Patients from both the groups also do not display much difference in their education, health condition, gender and age. But significant difference is observed among the average total expenses borne by households for inpatient care. Uninsured households face a very high share of expense. Similarly incidence of having 40% or more shares of inpatient care expenses out of income is observed more among uninsured households. Compared to insured average household size and highest educational qualification in the family is comparatively lower among uninsured.

Using bivariate analyses, relations between publicly funded health insurance schemes and risk coping strategies are analysed. Table 3 gives detailed results of the analysis. A positive significant association is observed among health insurance and savings. Being insured has a positive significant association on the use of savings for inpatient care. A relevant difference in the median amount of savings used for inpatient care is observed among insured and uninsured households. Risk coping strategies of borrowing and sale of assets for inpatient care are found to have negative association with being insured. Probability of chi square value shows significant *P* value. This reflects the fact that the average amount used from both these coping strategies by insured households are significantly different and is lower compared to uninsured households.

To understand the relationship of health insurance and risk coping strategies multivariate analysis were carried out. The probit regression analysis shows that health insurance coverage has a significant impact on the use of borrowing as a coping strategy for inpatient care (Table 4). The probability of using borrowing for coping with inpatient care expenses for uninsured compared to insured beneficiaries are higher by around 33%. Also the amount of borrowings used for inpatient care is significantly high among uninsured households. First time beneficiaries of the insurance scheme have a negative but insignificant impact on the borrowing compared to insured households that have used its benefits more than once. The results show that more than income or overall health expenses, it is the incidence of incurring inpatient care expense above 40% of the total income which influences the decision to borrow. The influence of total income and total health expenses incurred among poor has very small influence on the decision of borrowing though they are significant determinants. When health expenses go beyond 40% of the income probability of resorting to borrowing increases by 46%. The likelihood of borrowing is also high when the average distance to hospital increases. Patients suffering from chronic illness are another significant factor which increased the possibility of borrowing (21%). Chronic health conditions also increased the amount of borrowing for paying

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inpatient care. MGNREGA participation in the family also increases the possibility and amount of borrowing for inpatient care. But an increase in the number of working members in the households showed less likelihood (12%) to borrow for paying their inpatient care.

The results of regression for sale of assets showed that health insurance coverage is not a significant determinant of using sale of assets as a coping strategy against health care expenses (Table 5). Though the coefficients of health insurance show a negative relationship, it is not significant enough to influence the decision of sale of assets. Results show households' probability to use coping strategy of sale of assets increases when health expenses average total and its share in income goes beyond 40%. When average distance to hospital increases, the tendency to sell assets to cope against health expenses also increases. Place of residence did not significantly influence the risk coping strategies of borrowing and sale of assets. A mutual influence of both borrowing and sale of assets is shown in the results. Use of any one coping strategy will reduce the probability of use of another strategy.

2.1 Discussion

The study on the impact of publicly funded health insurance schemes on risk coping strategies throws light on the area which is largely unexplored in the context of India. Most of the studies focused only on the impact of PFHI on out of pocket expenditure, health status and health care utilisation. This case study of publicly funded health insurance scheme in Kerala helped us to understand the impact on distress coping strategies such as borrowing and sale of assets. Borrowing is the most commonly used coping strategy against health expenses after savings in the study. Use of saving as a coping strategy is found more among insured households than uninsured ones. Results of the study showed that PFHI coverage for poor helped them to resort less on borrowing. Even the amount of money used from borrowings to pay for inpatient care is found significantly lower among insured households. But the impact on sale of asset is not significant among insured households The impact among first time beneficiaries of the insurance scheme is not found significant in terms of both the coping strategies compared to beneficiaries who received more than once. This shows the need of clear awareness about the benefits received from the scheme so that households can anticipate and manage expenses to avoid unnecessary additional expenses. Results thus reflects the partial positive impact of PFHI have on reducing the reliance on distress coping mechanisms.

When expenditure goes beyond the budget constraint of a household, they resort to borrowing or other coping strategies. Results have also shown that it is the incidence of catastrophic health expenditure which increases the chances of borrowing among the poor. Less probability of borrowing among insured below poverty line households proves that health insurance could limit the share of health expenses largely within their savings. Poor

households resort largely to informal loans with exorbitant interest rates as they lack securities and lack access to formal financial mechanisms [22,23]. The tendency to rely less on borrowing will thus protect poor households from incurring any additional expenses in the form of high interest rates and debt traps. The findings have shown that participation in MGNREGA from a family could increase the tendency to borrow against health expenses. This could be because the participation in MGNREGA brings households more close and involved with the local self-help groups as most of the members in the employment programme are the members of self-help groups. This ensures more easy funds at a very low rate of interest. Moreover MGNREGA brings people who work together in such a way that they mutually help each at the time of a financial need. Both these aspects increase the possibility and sources of borrowing among households with MGNREGA participation.

The results of the study are similar to the findings of Indian studies on micro health insurance [17,18]. They found a significant impact of micro health insurance on borrowing and not much on the use of sale of assets as a coping strategy in India. But at the same time contradicts with the findings of a study on health coverage in Uganda [15].Therefore the results of the study cannot be generalised as it is subjected to change with difference in insurance scheme and place where it is implemented. At the same time study gives evidence to prove that health insurance can be used as a tool to protect people from distress coping mechanisms. To ensure better financial protection from the risk of illness, health insurance coverage can be improved along with an increase in coverage amount as households still depend largely on savings for covering expenses.

Table 3: PFHI and Risk Coping Strategies

Coping strategies	Insured (1)	Uninsured (2)	Total (1+2=3)	*P* value (Cramer's V) (4)
Savings				
Yes	241(87.64)	34(12.36)	275(100)	.002(0.307)
Amount used from savings(Median)	2156.3	2684.8	2267.7	.001†
Borrowed				
Yes	74(37.19)	125(62.81)	199(100)	.001(-0.385)
Amount used from Borrowings (mean standard deviation)	5664.6	40730.2	13055.9	.001†
Sold assets				
Yes	11 (61.11)	7 (38.89)	18 (100)	.002(-0.211)
Amount used from sold assets (median)	183.22	12500	2779.7	.001†

Table 4: Results of Regression for Coping Strategy of Borrowing

	Probit(1)			OLS(2)	
	Coefficient	**dy/dx**	**P value**	**Coefficient**	**P value**
Household characteristics					
Uninsured	1.09	0.325	0.003	2.24	0.002
First time beneficiary	-0.19	-0.071	0.26	-0.56	0.18
MGNREGA participation	0.48	0.171	0.01	0.96	0.01
Income	0.00	0.000	0.05	0.00	0.02
Household size	0.00	0.002	0.95	0.01	0.96
Number of working members	-0.30	-0.111	0.03	-0.65	0.03
Total expenses	0.00	0.000	0.01	0.00	0.0001
Highest education	0.01	0.005	0.71	0.03	0.62
Type of ration card	-0.33	-0.114	0.17	-0.66	0.22
Catastrophic health expense	1.58	0.455	0.0001	4.43	0.002
Sold any assets	-4.32	-0.730	0.002	-5.46	0.003
Community level characteristics					
Place of residence	0.11	0.039	0.57	0.15	0.73
Distance to hospital	0.01	0.004	0.01	0.03	0.003
Individual characteristics					
Education	-0.02	-0.007	0.47	-0.01	0.82
Chronic	0.60	0.205	0.003	1.50	0.004
Hindu	-1.02	-0.305	0.09	-2.34	0.12
Islam	-0.95	-0.362	0.14	-2.46	0.11
Scheduled Tribe	-0.58	-0.226	0.50	-1.16	0.49
Scheduled Caste	1.38	0.419	0.03	2.92	0.03
Other Backward Caste	0.89	0.330	0.16	1.81	0.18
Age	-0.01	-0.003	0.12	-0.01	0.40
Gender	0.07	0.025	0.68	0.36	0.32
Constant	-0.69		0.37	2.08	0.24
Observations	408				408
Log likelihood ratio	-169.049			R square	0.501
Hosmer Lemeshow (*P* value)	9.77			Fstat	17.52
	(0.281)			(*P* value)	(0.0001)

Table 5: Results of Regression for Coping Strategy of Sale of Assets

	Probit(1)			Ordinary Least Square(2)	
	Coefficient	dy /dx	*P* value	Coefficient	*P* value
Household characteristics					
Uninsured	0.47	0.0019	0.48	0.509	0.11
First time beneficiary	-0.10	-0.0003	0.83	-0.247	0.25
MGNREGA participation	0.65	0.0021	0.13	0.384	0.06
Income	0.00	0.0000	0.76	0.000	0.78
Household size	-0.12	-0.0003	0.46	-0.133	0.04
No of working members	-0.24	-0.0006	0.48	-0.021	0.89
Total expenses	0.00	0.0000	0.02	0.000	0.002
Highest education	0.11	0.0003	0.18	0.058	0.10
Type of ration card	-0.04	-0.0001	0.94	0.066	0.81
Catastrophic health expense	1.83	0.0274	0.01	0.584	0.04
Borrow	-2.68	-0.0329	0.0001	-1.160	0.0002
Community level characteristics					
Place of residence	1.11	0.0019	0.16	0.155	0.48
Distance to hospital	0.02	0.0000	0.06	0.010	0.02
Individual characteristics					
Education	0.00	0.0000	0.93	-0.030	0.26
Chronic	0.01	0.0000	0.98	-0.054	0.81
Hindu	3.28	0.0059	1.00	-0.361	0.65
Islam	4.22	0.5997	1.00	0.252	0.76
Scheduled Tribe	†			0.154	0.86
Scheduled Caste	6.32	0.8530	0.99	0.944	0.19
Other Backward Caste	5.34	0.0976	1.00	0.394	0.58
Age	0.00	0.0000	0.96	-0.006	0.37
Gender	0.29	0.0007	0.44	0.236	0.21
Constant	-13.49		0.99	-0.037	0.97
Observations	392				392
Log likelihood ratio	-34.57			R square	0.26
Hosmer Lemeshow (*P* value)	2.89 (0.94)			F stat (*P* value)	7.52 (0.000)

source: author's calculation

†scheduled tribe is dropped from analysis due to limited variation

4. CONCLUSION

The study tries to understand the impact of health insurance coverage for poor on expensive risk coping strategies such as borrowing and sale of assets. It is found that insurance coverage for the poor has a negative impact on the probability of borrowing for paying health care expenses. The amount of borrowing is also found to be significantly lower among insured compared to uninsured households. Though sale of assets is the least used coping strategy in the study, health insurance doesn't make any significant difference in the probability of using the same. A significant impact on sale of assets is not observed as it is observed on borrowing strategy. Insurance coverage has a partial impact on the use of costly and distressing coping mechanisms. Partial impact could be because of the limited small size of benefit coverage from insurance. Reduced probability to use borrowing as coping strategy among insured households helps them to smooth their consumption without having any reduction or additional burden against the risk of illness. Publicly funded health insurance coverage can therefore be used as one of the strategies to ensure equitable and affordable health care for the poor.

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APPENDIX

Table 6: Results of Reduced Form Probit Regression of Health Insurance

Variables	Coefficient	*P* value
MGNREGA participation	-0.146	0.50
Place of residence	-0.493	0.05
Colour of card	0.519	0.06
Household size	0.189	0.02
Highest education in the household	0.048	0.19

Number of working members	0.006	0.97
Distance to hospital	0.008	0.06
Total expenses of inpatient care	0.000	0.001
Age	0.013	0.05
Sex	-0.116	0.57
Education of the patient	0.019	0.49
Catastrophic health expense	-1.444	0.002
Hindu	-3.704	0.99
Islam	-3.418	0.99
Scheduled Tribe	-1.359	0.15
Scheduled Caste	-0.738	0.38
Other Backward Caste	-0.743	0.37
Income	0.000	0.003
Chronic	0.068	0.78
Change of choice of healthcare	-0.260	0.21
Relation to household head	-0.083	0.0001
Unskilled	-0.364	0.56
Semiskilled	-1.194	0.08
Constant	5.537	0.98
No of observation	408	

source: author's calculation

Table 7: Results of Probit Regression of Endogeneity Test of Health Insurance

	Borrowed (1)		Sold assets (2)	
Variables	**Coefficient**	*P* value	**Coefficient**	*P* value
Health insurance	-1.222	0.001	-0.256	0.71
Health insurance predicted	0.145	0.87	-1.906	0.24
MGNREGA participation	0.480	0.01	0.587	0.17
Place of residence	0.120	0.54	1.142	0.17
Colour of card	-0.333	0.19	0.078	0.89
Household size	0.008	0.90	-0.077	0.63
Highest education in Household	0.008	0.82	0.117	0.14
Number of working members	-0.305	0.03	-0.308	0.39

Distance to hospital	0.011	0.02	0.020	0.04
Total expenses of inpatient care	0.000	0.01	0.000	0.19
Age	-0.009	0.15	0.007	0.60
Sex	0.071	0.68	0.192	0.62
Education of the patient	-0.015	0.55	0.008	0.88
Catastrophic Health Expenditure	1.618	0.0001	1.226	0.14
Hindu	-1.012	0.10	2.685	1.00
Islam	-0.928	0.15	3.717	1.00
Scheduled Tribe	-0.554	0.53	0.000	†
Scheduled Caste	1.368	0.03	5.923	0.99
Other Backward Caste	0.876	0.17	4.901	0.99
Income	0.000	0.07	0.000	0.67
Chronic	0.622	0.002	0.129	0.78
Sold assets	-4.352	0.003		
Borrowed			-2.861	0.002
Constant	0.263	0.81	-10.887	0.99
No of observation	408		392	

source: author's calculation

†scheduled tribe is dropped from analysis in the second model due to limited variation

Table 8: Test of Endogeneity after Estimating Instrumental Variable Regression

	Amount of borrowings		Amount of sale of assets	
Ho: variables are exogenous				
Durbin (score) chi2(1)	1.477	(*P* value =0.22)	0.109	(*P* value =0.74)
Wu-Hausman F(1,382)	1.388	(*P* value =0.23)	0.102	(*P* value =0.74)

source : author's calculation