Public Health Review - International Journal of Public Health Research

Socioeconomic inequality of catastrophic health expenditure in Manipur

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DOI: https://doi.org/10.17511/ijphr.2021.i05.01

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Background: The incidence of catastrophic health expenditure (CHE) is one of the indicators for monitoring the performance of a health system in protecting the financial hardship after availing of the service. Further, CHE has also raised the issue of equity. **Aim & Objective:** To explore the determinants of CHE and also to measure the extent and contribution of socioeconomic factors in CHE in Manipur. **Settings and Design:** Manipur is a small hilly state located in the north-eastern region of India. The health expenditure in Manipur as part of the GSDP is very low and stands at 2.79%. This has made rapid growth and expansion of private health care in the state. A cross-section study of primary data of 200 households consisting of 1130 individuals reporting hospitalization during the last 365 days (during 2016) was identified and surveyed. **Methods and Material:** The incidence of CHE was defined when total health expenditure exceeds 10% of the total household expenditure. The OLS regression has been adopted to identify the significant factors of CHE. Concentration index and decomposition analysis measure the degree of socioeconomic inequality and its contributing factors respectively in Manipur. **Results:** The results show that the wealth index, economic crunch (p=0.022), type of disease (Neoplasm (p<0.01) & Genitourinary (p<0.05), the total number of episodes (p<0.05), and duration of stay in hospital (p<0.05) are found to be the significant factors in determining CHE. The concentration index and decomposition analysis indicate that the wealth index plays a vital role in socioeconomic inequality in CHE. **Conclusions:** The study reveals that the CHE mainly concentrates among the poor household, and intervention of health protection schemes should primarily be focused among the socially and economically backward households.

Keywords: Catastrophic Health Expenditure, Economic crunch, Socioeconomic inequality, Concentration index, Decomposition analysis

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Introduction

Globally, the incidence of catastrophic health expenditure has been accelerating at 9.7% (2000), 11.4% (2005), and 11.7% (2010). About 808 million people face catastrophic health expenditures in which the majority of contribution comes from the Asian (531.1 million people) and African (118.7 million people) countries[1]. As per a report of NHSRC (NSSO 71st Round (2014) in Indian State fact Sheets), the overall rate of incidence of catastrophic health expenditure in India was 18%, and in Manipur, a north-eastern state of India, was 6.3%[2].

Catastrophic health expenditure in literature can be referred to as a level of health expenditure in terms of out-of-pocket expenditure (OOP) exceeding a certain proportion (10% and above) in total household expenditure [3,4]. But instead of total household expenditure, some use the capacity to pay (CTP) concept (total expenditure minus subsistence expenditure) and define catastrophic health expenditure as the ratio of health expenditure that exceeds more than 40% of the capacity to pay [5]. The threshold level sets in both measurements of catastrophic health expenditure have been considered arbitrary for being under or overestimated of catastrophic health expenditure since the rich and the poor households have differential levels of ability to spend on health to the household income. Despite some drawbacks, these methods of measuring catastrophic health expenditure have been widely used in many studies [6-9]. Most of the earlier works on the determinants of catastrophic health expenditure consist of socioeconomic status (SES), demographic characteristics, type of diseases (both communicable and non-communicable), health insurance coverage, type of health facility, and access to health care delivery points.

An earlier study comprising 59 countries has indicated three essential preconditions for catastrophic payment: the accessible health service requiring payment, low capacity to pay, and the lack of health insurance [5]. In the U.S., a study revealed that poor households with multiple chronic diseases had higher chances of catastrophic payment [10]. A similar finding was also observed in an Indian study. And also, hospitalization for cardiovascular disease (CVD) or injuries Was about 22% higher in catastrophic payment than other communicable diseases [11]. Again in India, it is found that the catastrophic cases increased more among the poorest compared to the richest quintile. Such health payment was highest in the household with older members [12]. Several other studies of health insurance as a determinant of catastrophic health expenditure emerge with contradictory results. Some studies found to have a significant relation in reducing the risk of catastrophic health expenditure [13-15], while other studies revealed that health insurance increases the chances of catastrophic health expenditure due to operation of both moral hazard and adverse selection [16-18]. At the same time, there was no association between health insurance and catastrophic health expenditure [19].

Aim and Objective(s)

- To explore the level of CHE in Manipur

- To study the determining factors of CHE in Manipur

- To explore the nature and magnitude of socioeconomic inequality among the CHE household

Materials and Methods

Study area: Manipur is a small hilly state located in the north-eastern region of India, sharing a border with Nagaland to the north, Assam to the west, Mizoram to the southwest, and an international border with Myanmar to the east and south. Manipur had 28,55,794 population (close to 3 million population) in 2011 [20]. Though small in size, Manipur has a competitive edge in terms of a social indicator. The health outcome of Manipur has a better place as compared to the national level with an infant mortality rate of 12 compared to 33 of the country [21]. However, the health expenditure in Manipur, as part of the GSDP, stands at 2.79% [22], much below 5% of GDP as recommended by the WHO [23]. This has made rapid growth and expansion of private health care in the state. Meanwhile, NFHS-4 (2015-16) report has also shown the coverage of health insurance in Manipur only 3.6% of the household as against 27.7% at the national average [24]. This shows that many healthcare expenditures, such as doctor fees, medicines, and medical tests, have been funded by private sources, putting a significant burden on poor households and jeopardizing basic needs.

Study design and data: A cross-section of data were collected in 2016 as a part of the author's thesis. The hospital records of the patients from a public hospital (Regional Institute of Medical Sciences, RIMS) and a private hospital (Shija Hospital and Research Institute) were compiled and traced the address of the selected patients for interview. For patients in a public hospital, sample households were chosen and surveyed with a duration of hospital stay (at least ten days), with the expectation of high household expenses on the cost of hospitalization, whereas for patients in a private hospital, a condition of at least two days of stay in the hospital was used. The unit of analysis is the household since the decision of hospitalization and the burden of cost spread across the household members. Overall, 200 households having 1130 individuals were contacted for personal interviews. In the interview, household characteristics, demographics, particulars of hospitalization during the 365 days before the survey were collected. The data of out-of-pocket health expenditure (OOP) was collected along with total household expenditure.

Measurement of Catastrophic Health Expenditure

Catastrophic health expenditure (CHE) is calculated as the ratio of out-of-pocket health expenditure to the total household expenditure, and a threshold of 10% or more of total household expenditure on health expenditure has been used for defining the incidence of catastrophic health expenditure. It can be represented as follow:

$$CHE = \frac{Total\ health\ expenditure}{Total\ household\ expenditure}$$

Statistical analysis

For exploring the determining factor of catastrophic health expenditure, the OLS regression model has been inducted to identify the significant factor for CHE. For investigating the socioeconomic inequality among the CHE households, the concentration index and decomposition method have been considered a standard method adopted in many studies [25, 26]. The concentration index, which measures the magnitude of socioeconomic inequality in a health outcome variable, can be defined as double the area between the concentration curve and the line of equality. The negative value of the index when the curve lies above the line of equality indicates

More concentration on the poor and vice versa. The calculation of the concentration index with the formula is stated below:

$$C = \frac{2}{N\mu} \sum_{i=1}^{n} h_i r_i - 1 - \frac{1}{N} \quad (1)$$

Where denotes health outcome variable (CHE), μ is mean of the outcome variables and r_i is the fractional rank of household in the economic status with i=1 for the poorest and i=N for the richest. For computational convenience, the concentration index can also be summarised by the following formula:

$$C = \frac{2}{\mu} cov_w (h_i\ r_i) \quad (2)$$

Where is the (CHE) with a log transformation of the ith household and r_i is the fractional rank of the ith household based on the index of economic status [27, 28]; μ is the mean of the health outcome in the sample and cov_w denotes the covariance of (h_i and r_i).

The concentration index is further decomposed to identify the main contributing factors of socioeconomic inequality among CHE. The decomposition method of the concentration index operates only with the linear regression model [29, 30]. Therefore, we used the continuous form of health outcome (CHE) with log transformation between the total health expenditure and the total household expenditure as a dependent variable. The linear regression model was run to calculate the coefficient between socioeconomic determinants and the health outcome ratio. It can be represented as follow:

$$Y_i = \alpha + \sum_k \beta_k X_k + \varepsilon_i \quad (3)$$

Where Y_i is the health outcome variable (CHE), β_k are the coefficients of the independent variable X_k and ε_i is the error term. The concentration index for Y_i, C can be written as follows:

$$C = \sum_k \left(\frac{\beta_k \bar{X}_k}{\mu}\right) C_k + \frac{GC_\varepsilon}{\mu} \quad (4)$$

Where is the mean of Y_i, $\bar{x}$ is the mean of X_k, C_k is the concentration index for X_k, GC_ε is the generalized concentration index for the error term (ε_i). The above equation (4) has two parts; the first part (deterministic or explained part) includes elasticity ($\beta_k\ \bar{x}_k / \mu$) which shows the impact of explanatory variables on the health outcome

Variable (CHE) and Ck reflects the inequality in the distribution of determinant variables among the socioeconomic groups. The second part of the equation $GC\varepsilon/\mu$ is the residual or error term in which the inequality of health outcome (CHE) among the socioeconomic groups which cannot be explained by the contributing factors. All the statistical analyses of the present study were performed in Stata 15.

Ethical approval: The study relied on survey data, and there was no human experimentation, and "informed consent" was taken for sharing family and personal details.

Results

The main results are presented with frequency tabulation of all the variables of interest and the bivariate relationship between socioeconomic, demographic, household economic fluctuation (economic shocks), and treatment (hospitalization) factors with outcome variable catastrophic health expenditure through its mean and median values. For finding determinants of CHE, simple multiple regression model between the independent variables such as type of residence, socioeconomic and demographic variables, the economic crunch (shock) of the household, place of hospitalization, type of diseases, total episode of hospitalization, and the dependent variable (the catastrophic health expenditure) was employed. The results of concentration index and decomposition analysis are presented across the socioeconomic variables to address the inequality.

Table no.1: The percentage distribution of the level of catastrophic health expenditure of the sample households

Level of Catastrophic Health Expenditure	Freq. (n=200)	Percent	Cumulative Total
0-9	2	1.00	1.00
10-19	26	13.00	14.00
20-29	33	16.50	30.50
30-39	23	11.50	42.00
40-49	19	9.50	51.50
50-59	19	9.50	61.00
60-69	18	9.00	70.00
70-79	14	7.00	77.00
80-89	5	2.50	79.50
90-99	5	2.50	82.00
100 & above	36	18.00	100.00
Total	200	100	100

(Table no. 1) presents that among the different levels of catastrophic health expenditure, 100% and above levels had the highest concentration with 36 of the sample households. Further, when considering the conventional 10% or more of health expenditure as the threshold of defining the incidence of catastrophic health expenditure, 99% of the sample households fell into the catastrophic health expenditure category. This means that the sample households had very high health expenditures in the study period.

Bivariate analysis

(Table no. 2) observes that the overall mean share (average) of health expenditure to the total household expenditure was 74.13%. The out-of-pocket share in the total household expenditure was higher among the rural (80.10%) than urban areas (62.26%). The median share also followed the same pattern where urban households had a lower expenditure on health care than rural households. However, there was not much difference by gender of the head of the households. As expected, the poorest households belonging to self-employed in non-agriculture had the highest share of OOP expenditure (87%), whereas the salaried households had the lowest share (45.64%). A better picture was social groups. The OBC households (87.50%) had a higher share of health expenditure than the general category (64.70%). The other group comprising SC and ST had the lowest number in composition but had experienced a higher mean value of catastrophic health expenditure (77.1%). Educational attainment did not have any standard pattern implying that hospitalization costs did not relate to such attributes. As observed in the sample, if the head of the household happened to be self-employed, there was a higher likelihood of spending on health against their total household expenditure than any other group such as regular salaried or rentier/pensioner or others. Another household level variable constructed through principal component analysis using the household possession of assets, amenities, and housing attributes was the wealth index, which was classified into five quintiles. From the wealth index, it was found that the middle and poorer section had a higher level of spending on health compared to the rich and richer category of households in terms of both mean and median levels of spending aligning in the same way as found in other literature too.

Table no. 2: Bivariate relationship between background variable and catastrophic health expenditure with the mean and median values.

Variables	Mean (%)	Median (%)	n (200)
Type of residence			
Rural region	80.10	47.50	133
Urban region	62.26	40.53	67
Sex of head			
Male	75.17	48.11	161
Female	69.84	40.83	39
Educational level of household head			
Illiterate	65.07	41.43	20
Below Primary	84.86	49.11	28
Primary < Middle	61.60	50.33	20
Middle < Matriculate	64.78	44.11	47
Matriculate < Senior secondary	63.59	37.26	27
Secondary &above	88.89	50.35	58
Household type			
Regular wage/ salary earnings	45.64	32.45	50
Self-employed in non-agriculture	86.97	45.52	79
Self-employed in agriculture (own & cultivation)	80.05	57.76	52
Others	79.55	48.11	19
Social Group			
General	64.70	50.61	104
OBC	87.49	42.04	67
Others	77.08	40.83	19
Wealth Index			
Poorest	88.87	53.75	40
Poor	71.04	55.88	40
Middle	105.85	44.41	40
Rich	59.07	44.38	40
Richest	45.84	32.33	40
Economic crunch of the household			
No	65.82	38.87	107
Yes	83.68	62.84	93
Overall total	74.13	47.24	200

(Table no. 3) Hospitalization attributes had a better and systematic relationship with health expenditure in the sample. Among the households having experienced some kind of economic shock in the form of illness, social ceremonies, business failure, etc., in the last 5 years before the last hospitalization had the highest health expenditure in terms of both mean (83.60%) and median (62.80%) share. Among the type of hospitals, the households hospitalized in both hospitals (public & private) bore the maximum

Value of both mean (92.40%) and median (67.30%), while hospitalization in the public hospitals had a higher cost than the private hospitals only. This must be related to both types of illness and duration of stay in the hospital. Duration of stay in hospital had strong evidence of association with the higher expenditure on health care where households with at least 21 days of hospital stay had a whooping value of both mean (121.50%) and median (78.60%), which were significantly more than the households with a shorter hospital stay.

A similar pattern followed in the case of a higher number of episodes of hospitalization in any hospital, whether only in public, private or in both types of hospitals. Among the type of diseases, the neoplasm was associated with the highest health care expenditure among the diseases. Even genitourinary diseases, which were often associated with a higher chance of surgery of kidneys mainly due to the presence of stone, had a higher expenditure on health care. It was also quite evident in our data that hospitalization of chronic diseases with a longer duration of hospital stay had a higher payment.

Table no. 3: Bivariate relationship between hospitalization attributes and catastrophic health expenditure with the mean and median values.

Variables	Mean (%)	Median (%)	n(200)
Type of hospital			
Public	77.28	41.14	126
Private	40.97	33.05	34
Both	92.40	67.35	40
Total episode in hospital			
1st Episode	38.06	27.74	94
2nd Episode	98.44	57.00	55
3rd Episode	101.64	83.94	31
4th Episode	134.21	130.33	20
Total stay in hospital			
≤10 days	34.11	24.70	43
11-20 days	48.15	35.89	78
≥ 21 days	121.57	78.64	79
Type of diseases			
Circulatory	51.07	42.34	26
Digestive	41.56	29.25	63
Neoplasm	128.60	113.54	33
Genitourinary	62.18	53.17	23
Others	94.66	52.24	55
Overall total	74.13	47.24	200

Multivariate analysis

From the multiple regression model (as summarised in **(Table no. 4)**), the predictor variables such as socioeconomic and demographic, type of residence, sex of head, social group, economic fluctuation of the household, educational level of the head, duration of stay in hospital, type of diseases, total episode in the hospital were put together to test the significant on the response variable - the catastrophic health expenditure. From the model, it was found that many of the usual household-level variables did not turn out to be statistically significant. This is no wonder because the samples were mainly drawn from the households which had put a significant amount of resources on health-care expenditure. However, some of the notable variables in the model in terms of statistical sense were the wealth index of the household and type of disease and hospitalization variables. Within the economic indicators, the wealth index showed that better households (rich and the richest) had less catastrophic expenditure compared to the poorest group, while the households having experienced any economic shock earlier (economic crunch) also had a significant increase in the catastrophic health expenditure with a higher coefficient value (0.22) over those households which did not suffer this shock. Further, the nature of hospitalization, such as the number of hospitalization episodes (multiple against only one) and duration of stay in hospital (longer days of hospitalization), were significant factors with an increased chance of catastrophic health expenditure.

Lastly, types of diseases such as Neoplasm, Genitourinary diseases, and other types of diseases were also found to be significant factors with p-values less than 5 percent compared to the circulatory system as reference. Other social and demographic factors, namely type of residence, sex of head, social group, educational level of the household head, and type of hospital, though important, could not explain the variation of catastrophic health expenditure in the sample households.

(Table no. 4) further shows the decomposition analysis of the concentration index for CHE and its determinants for socioeconomic inequality. The decomposition analysis includes the coefficient value of the predictors, the concentration indices, elasticity (not shown), absolute value

Of contribution, and the percentage contribution of each independent variable contributing to the socioeconomic inequality among the catastrophic health expenditure (CHE) households. Whether the incidence of CHE is equally distributed or not across the wealth index is determined by the concentration index value. If the concentration index value is negative, then it means that the determinant factors are more prevalent among the poor households and vice versa. In our analysis of the sample data, the concentration index was found to be -.031, showing more concentration of catastrophic health expenditure among the poor. The wealth index accounted for 92.5% of the income inequality of catastrophic health expenditure. Lesser important contributing factors were found in factors such as the number of episodes of hospitalization (3.6%) and duration of stay in the hospital (5.4%). Type of hospital, type of diseases, and experience of economic crunch came out to be contributing negatively. This implies that these factors could reduce the income inequality of catastrophic health expenditure. To our understanding also this analysis helps a deeper understanding of the inequality of catastrophic health expenditure among the sample households in the study. The residual value (8%) reflects the part of inequality in CHE, which was not explained by the systematic variation among the chosen explanatory variables.

Table No. 4: Results of multiple regression, concentration index and decomposition of catastrophic health expenditure

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Discussion

Protecting households from the financial hardship of health payment is one of the primary goals of any health-care system in all countries, irrespective of the level of development of any country particularly low and middle countries. In a developing country like India in general and a smaller state like Manipur in particular, most of the health payments were borne by out-of-pocket health payments. Therefore, protecting families from the ambit of catastrophic health expenditure is a public health issue. The bivariate analysis has clearly shown a lead as the relationship of catastrophic health expenditure across different individual, household, and hospitalization attributes.

The hospitalization attributes had a strong and significant relation with CHE compared to the other individual and household characteristics. Among the household characteristics was the wealth index, whereby the richer quintile household had a lesser amount of catastrophic health expenditure than the poorer households. This relationship was in the expected direction. Confirming the bivariate relationship, the OLS regression results (shown in Table no. 4) revealed that the richer segment of the wealth index, i.e., the richest group were less likely to confront the incidence of catastrophic health expenditure than the poorest group of wealth index. This finding is consistent with the findings of other studies conducted in other parts of the world [31-33]. Since the poor families had a lower ability to withstand a jolt of such impact of hospitalization, such households suffered a higher burden of out-of-pocket health payment on them. Other variables such as type of diseases were also found significant in some studies of India where the incidence of hospitalization due to cancer was associated with the highest incidence of catastrophic health expenditure.

Not only fatal cases, the number of episodes of hospitalization, but also the duration of stay in hospital [11, 34] happened to have a high incidence of catastrophic health expenditure. At the same time, factors like residence and other demographic factors did not have a strong differential impact on catastrophic health expenditure. This could relate to the sample households which had already experienced a higher level of health expenditure. Further, most of the earlier works focused on the economic, demographic, and physical well-being profile of the head of household rather than the overall status of the household. In the present study, a separate variable of the household "household type" was employed in the bivariate analysis producing a similar finding of a lower level of CHE among the better-off households (salaried/regular wage). The earlier work in South Korea examined the relationship between the economic status and the catastrophic health expenditure and found that changes in economic status (job changes/loss) of household heads were more prone to face catastrophic health expenditure than the household which did not experience a change in job status [35]. In this paper, a new independent variable economic shocks (past events) in the household such as financial crunch

Due to illness and financial crunch due to other incidents like social ceremonies such as marriage, funeral, business loss, house construction, etc. in the last 5 years period before hospitalization was introduced and found associated with the catastrophic health expenditure. Furthermore, the decomposition analysis demonstrated that the overall concentration index in Manipur was observed to be -0.031 in the sample data, indicating a higher concentration of catastrophic health expenditure among the poor, which was a similar finding in the study of catastrophic health expenditure (CHE) in other states like West Bengal where the chances of facing the incidence of CHE was excessively confined among the poor than the rich [36]. While examining the contribution of each of the variables in the decomposition analysis of concentration index, the household economic indicator 'wealth index' was contributing 92.50 percent of the socioeconomic inequality in catastrophic health expenditure. This result bore and confirmed the finding of similar studies in Iran, where a significant proportion (83 percent) of the reported socioeconomic inequality among households facing CHE was associated with the households' economic status [37].

Other variables like the treatment characteristics such as duration of stay (5.40 percent) and episodes of hospitalization (3.57 percent) also positively contributed to socioeconomic inequality in the CHE analysis. This study also found that the households with the type of diseases variables had a negative contribution (-3.30 percent) in socioeconomic inequality, indicating this variable playing the role of a levelling field of CHE, which was consistent with another study in China [38]. A possible reason for this could be the prevalence of more cases of ailment such as neoplasm (any form of cancer), genitourinary (Kidney ailment), and digestive ailment (liver and other gastrointestinal) among the rich households, whereas the others ailment such as infectious diseases, bone, eyes related ailments etc., were concentrated among the poor households. Although this study did not cover the prognosis of the diseases, it was thought that the neoplasm would have taken the toll of the catastrophic health expenditure. Evidence from this study also shows that a higher level of health expenditure to the level of catastrophic was experienced by patients with neoplasm disease across all the households

Of different wealth quintiles. But the absorption capacity of health expenditure shock was much resilient among the highest wealth quintile against all odds of different diseases.

Conclusion

This study explored a new determinant factor of catastrophic health expenditure, i.e., the economic shock in the household, which had high relevance in developing countries or states where the economy has been primarily dominated by the informal sector associated with more frequent unstable household income. This study fills up the research gap and has shown that the economic crunch in the household is one of the important determining factors of catastrophic health expenditure, along with other variables identified in different studies.

Recommendation

The study suggests that the policies for financing health-care, especially for poor households, are the most important objectives for developing countries to fulfill their welfare objective of reducing socioeconomic inequality and the implementation of health insurance coverage especially among the poor households which need health care services. The study of catastrophic health expenditure is useful not only for comparing the fairness in health-care financing throughout the countries or within the country but also for evaluating the level and effectiveness of financial protection schemes which are the essential criterion of Universal Health Coverage.

Limitation of the study

There are some limitations to this study. The wealth index based on PCA analysis of the household assets was used to measure the economic status since there was no direct measurement of income. The contributions of the economic status in CHE inequality may vary from the initial condition of the economic status of the household, which was not captured in the study. The survey data was based on self-reported household expenditure, which might be associated with some recall bias. The study focussed mainly on the cost of inpatient hospitalization cases, which did not account for other indirect costs and outpatient costs.

Relevance of the study

The study can highlight the inequality of CHE

Arising out of variation in economic indicators, which could not have been captured by regression alone.

This study supports the findings of other studies elsewhere around. Nevertheless, such type of study in the context of Manipur is very rare. This study is a modest attempt to examine how inequality exists in health care finance based on the standing economic condition of the household. Most studies, in literature, talk on health expenditure in general, and thereby the researchers try to find the extent of catastrophic expenditure incurred but in this study, it fundamentally started with the conviction that whenever hospitalization occurs, catastrophic expenditure follows. Another dimension in this study has been the documentation of how hospitalization associates and deepens with the condition of catastrophic health expenditure given the type of diseases.

Author Contributions

Conceived and designed the study by M. Hemanta Meitei. Analysis performed by Haobijam Bonny Singh and Kh. Jitenkumar Singh. M. Hemanta Meitei and Haobijam Bonny Singh wrote the paper.

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Table No. 4: Results of multiple regression, concentration index and decomposition of catastrophic health expenditure

Variables	Mean	Regression Coefficient	Concentration index	Contribution to CI	Contribution (%)
Region					
Rural	0.665	0	-0.037	0	0.178
Urban	0.335	-0.009	0.073	0	
Sex of head					
Male	0.805	0	-0.014	0	0.856
Female	0.195	-0.092	0.057	0	
HH Head Educational level					
Illiterate	0.1	0	-0.23	0	
< Primary	0.14	0.249	-0.262	-0.002	
Primary < Middle	0.1	0.101	-0.181	0	
Middle < Matriculate	0.235	0.097	-0.139	-0.001	1.308
Matriculate < Senior secondary	0.135	0.011	0.111	0	
Secondary & above	0.29	0.13	0.329	0.003	
Social group					
General	0.52	0	0.136	-0.001	
OBC	0.335	-0.126	-0.07	0.001	0.027
Others	0.145	0.063	-0.327	0	
Wealth index					
Poorest	0.2	0	-0.8	0	
Poor	0.2	-0.168	-0.4	0.003	
Middle	0.2	-0.199	0	0	92.483
Rich	0.2	-0.272*	0.4	-0.006	
Richest	0.2	-0.639***	0.8	-0.027	
Economic crunch/shock					
No	0.535	0	-0.013	0	-1.268
Yes	0.465	0.022**	0.015	0	
Type of hospital					
Public	0.63	0	-0.044	0.002	
Private	0.17	0.299*	0.207	0.001	-7.336
Both	0.2	0.231	-0.038	0	
Total episode in hospital					
1st Episode	0.47	0	0.02	-0.001	
2nd Episode	0.275	0.426***	-0.007	0	3.578
3rd Episode	0.155	0.502***	0.001	0	
4th Episode	0.1	0.461**	-0.076	0	
Duration of stay in Hospital					
≤10 days	0.215	0	0.067	-0.003	
11-20 days	0.39	0.327**	-0.025	0.001	5.406
≥ 21 days	0.395	0.686***	-0.012	0	
Types of disease					
Circulatory	0.13	0	-0.061	0	
Digestive	0.315	0.071	0.019	0	
Neoplasm	0.165	0.709***	0.017	0.001	-3.301
Genitourinary	0.115	0.413**	0.185	0.002	
Others	0.275	0.327**	-0.08	-0.002	
Explained					91.93
Residual					8.07
Total					100
*** p<0.01, ** p<0.05, * p<0.1					