



Determinants of Out-of-Pocket and Catastrophic Health Expenditure: A Cross-sectional Study

Rajesh Kumar Sinha^{1*}, Keya Chatterjee¹, Nirmala Nair¹
and Prasanta Kishore Tripathy¹

¹EKJUT-NGO, India.

Authors' contributions

This work was carried out in collaboration between all authors. Authors RKS and KC designed the study and organized the primary data collection. Author RKS did the statistical analysis, wrote the first draft and collated all inputs from other authors. Authors KC, NN and PKT gave critical inputs and insights into the article. All authors read and approved the final manuscript.

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ABSTRACT

Background: In India, Out of Pocket Health Expenditures (OOPHE) is as high as 70-80% of total health expenditures, borne by the families of ailing persons. In most cases such high OOPHE is catastrophic in nature, in the backdrop of high poverty level in the country. High OOPHE and Catastrophic Health Expenditures (CHE) have a potential to impoverish people. It is therefore important to identify the predictors of OOPHE and CHE, to formulate an equitable and efficient financial protection measure from health expenditure.

Methods: The study tried to understand the factors of out-of-pocket health expenditure and catastrophic health expenditure using the cross-sectional data from 986 sampled households in Koderma district of the state of Jharkhand in India. A multi-staged sampling method was followed to select households with incidences of in-patient care in the last one and child birth in the last two years and of out-patient care in the last one month. Alongside health expenditure data of the sampled households, their socio-demographic and socio-economic information were also collected using survey questionnaire.

Findings: Male headed households, families with more than five members, household head who

*Corresponding author: Email: rajesh.ekjut@gmail.com;

were unemployed or were engaged in agriculture or labour works as compared to those in service; household head aged above 60 years, households from higher expenditure quintiles, households with any member suffering from chronic illness, households reporting any episode of hospitalisation, in-patient or delivery services availed from private providers in the reference periods, families living closer to service providers especially private providers were significant predictors of high OOPHE.

Residence in rural area (aOR: 1.65, 95% CI 1.10 - 2.49), families living in 'kutcha' (mud house) houses (aOR: 1.46, 95% CI 1.06 - 2.0), families with lower social status like Schedule Tribe (aOR: 1.76, 95% CI 1.0 - 3.13), Scheduled Caste (aOR: 1.73, 95% CI 1.02 - 2.92) and Other Backward Classes (aOR: 1.42, 95% CI 1.02 - 2.01) compared to General castes, families where any member suffering from chronic illness (aOR: 2.33, 99% CI 1.48 - 3.67), families where any member had received in-patient care in the last one year irrespective of type of providers (aOR: 2.18, 99% CI 1.60 - 2.97), longer distance from health service providers, had higher likelihood of CHE.

Conclusion: The study tried to identify different predictors of Out of Pocket Health Expenditure (OOPHE) and Catastrophic Health Expenditure (CHE), incurred by families seeking medical care for various ailments. OOPHE was found higher among families from higher expenditure quintile; however, people from disadvantaged socio economic profile had higher likelihood of CHE. Apparently, even smaller OOPHE is proving to be catastrophic for families from lower socio-economic segments. Families with any member suffering from chronic illness were at a higher risk of CHE. OOPHE was considerably higher when services have been sought from private providers compared to public health providers, however, for in-patient care, expenditure incurred in both situations were found to be catastrophic.

Urgent action is needed for designing healthcare finance policies that is more equitable and efficient and has a potential to reduce OOPHE and incidences of CHE.

Keywords: Determinants of health expenditure; out-of-pocket health expenditure; catastrophic health expenditure; in-patient care; public health care provider; private health care provider; health insurance.

1. BACKGROUND

The recently released National Sample Survey Office (NSSO) 2014 of Ministry of Statistics and Programme Implementation, Government of India Health Survey¹ shows that an estimated 55 million people in India had foregone treatment in the previous year as they could not afford the cost. According to NSSO Consumer Expenditure Survey 2011-12, an estimated 4.5% or around 50 million households slipped below poverty line due to medical expenses. The distribution of health care received is skewed in favour of the people with better paying capacity [1,2], while the poorer sections are left out of the ambit due to depleted resources and absence of any financial security net to meet healthcare expenditures [3,4] thus substantiating the Law of Inverse Care where the people who need the most health care receive the least amount of services [5].

India spends around five percent of its Gross Domestic Product (GDP) on health, with Government contributing only about one percent and the remaining being borne privately by the patients or their families. The latest NSSO 2014 Health survey shows that 70-80% of the in-patient treatments sought private hospitals, despite the cost in private facilities being almost four times that of a public facility. NSSO 2014 estimated the cost per hospitalisation episode is approximately Rs. 26,000 in the private hospitals wherein in the public hospitals, it is around Rs. 6,000. Similarly, cost per out-patient visit is Rs. 700 in the private facilities and Rs. 400 in the public facilities. Yet, the higher level of utilisation of private facilities compared to public facilities shows either the lack of sufficient number of public providers or public providers providing poor quality of care compared to the private providers.

Poor public health delivery systems in India drive people to seek care from private providers at very high costs [6,7] and such high out-of-pocket healthcare expenditures are very often catastrophic to the households. Poor people tend to avoid seeking care; and when they do seek

¹ National Sample Survey Office, Ministry of Statistics and Programme Implementation, Government of India. Key Indicators of Social Consumption in India – Health. NSS 71st Round. 2014. Available:http://www.mospi.nic.in/Mospi_New/site/inner.aspx?status=3&menu_id=31

care, they are pushed into indebtedness or their poverty is deepened further. NSSO 2014 Health survey shows that 86% of the rural population and 82% of the urban population are still not covered under any of the health expenditure protection scheme. Also, of the total hospitalisation expenditure, merely 1% cases in the rural area and 6% cases in the urban area was reimbursed partly or fully from any of the health expenditure support programs. Due to the lack of financial protection measures, 31% of the total hospitalisation expenses in the rural area and 24% in the urban areas were mobilised from the borrowings which is the primary cause of impoverishment. [2,8] have estimated that every year millions of people in India are pushed below poverty line due to health care expenses.

Little is known about the factors that are associated with out-of-pocket health expenditure or catastrophic health expenditure. Most of the limited evidences are in the contexts of developed nations and a very few are available in the context of developing nations [9]. A study [10], shows the determinants (a family having at least one under five child, residing in rural areas and not having health insurance) of poverty incidence due to health expenditure, however, there is little information on the predictors of OOPHE and CHE.

To reconnoitre some of the factors affecting out-of-pocket health expenditure and catastrophic health expenditure, this study was undertaken in Koderma District of Jharkhand in the year 2013, with support from National Health Systems Resource Centre (NHSRC), Ministry of Health and Family Welfare, Government of India to gain insight into the current healthcare utilization, preference for providers and spending patterns on healthcare. Such insights could help in designing a more comprehensive, equitable and effective health care financing system to effectively reduce Out of Pocket Health Expenditure (OOPHE) and incidence of Catastrophic Health Expenditure (CHE) even by increasing the service provisioning.

2. STUDY DESIGN AND SAMPLING

The study was conducted from June to August in the year 2013. Koderma District of the state of Jharkhand borders the state of Bihar, and had a population of little over 700,000 as per Census 2011 with 14% Schedule Caste (SC), 1% Scheduled Tribe (ST) population. Literacy rate in the district is 67%. Koderma has two urban wards and six rural blocks, with 80% population

living in rural areas. It has undulated topography of hills, hillocks, forests and plain areas. Mining and agriculture are the primary occupations in the district, with Koderma. The district is one of the most backward districts in the country. Koderma was selected purposively based on close resemblance to overall Jharkhand State on some health indicators like complete immunisation rate, contraceptive use, percentage of mothers receiving Tetanus Toxoid immunisation and percentage of institutional deliveries.

A sample size of 864 households was calculated with anticipated population proportion of hospitalisation, $p=0.01$ and absolute precision, $d=0.02$. After accounting for design and sampling error, approximately 1000 households was taken as the final sample size [11].

A multi-stage sampling methodology was followed to select First Sampling Units (FSUs) and the sampled households. Probability Proportion to Size (PPS) sampling method using Census 2001 data was applied to identify FSUs. 28 FSUs were selected which were divided into 23 rural and 5 urban FSUs in proportion to rural-urban population.

A qualification/screening round was conducted where all the households in the selected FSUs were screened on four parameters: (a) if any member was hospitalized in the last one year; (b) if any member availed out-patient treatment in the last thirty days; (c) if there was a childbirth in the household in last two years, and, (d) household not falling in any of these categories. A total of 6809 households both from rural and urban areas were screened in this round.

36 households from each FSU were randomly selected for survey in the ratio of 2:1:1:1 respectively for the above four categories. From 28 FSUs, a total of 986 households were selected, of which 806 households were from rural areas and 180 households were from urban areas. Of the total 986 households, 400 households had cases of hospitalisation in the last one year, 196 had cases of out-patient care in the last thirty days, 194 had cases of child birth in the last two years and remaining 196 did not have any of the these three cases during the given reference periods.

3. SURVEY METHODOLOGY

Interviewers conversant with local language were recruited and trained for three days (including a

mock field survey) prior to the survey exercise. 10% randomly selected households were revisited during survey for quality checks.

Written consent was obtained from the main respondents of the households. Survey questionnaires translated in local language - Hindi were used for data collection. The questions were adapted from NSSO's Health and Morbidity Survey 2004 questionnaire, and tool-tested for local relevance. The key variables studied were profile of each household members in terms of education, gender, occupation, marital status, age, morbidity, health insurance coverage (if any); household size, social group (caste), Below Poverty Line (BPL) status, type of household structure, distance from nearest health service provider, type of health service provider for in-patient and out-patient treatment; expenditure incurred on different health events like out-patient treatment, in-patient treatment and delivery, their source of funding and overall household consumption expenditure.

Out-patient treatment were such ailments reported in last 30 days that did not require hospitalisation, irrespective of whether or not care was sought for such ailments and who the service providers were. In-patient treatment included episodes of hospitalisation in last one year reference period, but did not include cases of delivery. Delivery included cases of child-birth, abortion and miscarriages in the reference period of last two years. All ailments were self-reported. Health expenditure included cost of consultation, medicines, diagnostics, hospitalisation cost, informal payments and cost of transportation but did not include care giver's time cost or loss of income due to ailment, if the ailing person was also an earning member.

Household consumption expenditure included expenses incurred on food and other expenditures of recurring nature for past 30 days. Expenditure on non-food items like clothing, education, medical, durable goods and other items like conveyance, sundry articles, amusement etc. were taken for the last one year reference period and broken down to calculate monthly average. Finally, per capita monthly expenditure was calculated by dividing the sum of the above two expenditures by the number of family members. This calculation was used to determine the monthly per capita consumption expenditure and dividing the households into expenditure quintiles. However, for assessing incidence of CHE, monthly household consumption expenditure was used.

3.1 Data Analysis

Data entry was done in Microsoft Access software and multivariate analyses were performed using SPSS 20 software package.

Multiple regression analysis was performed with Out-Of-Pocket Health Expenditure (OOPHE) as dependent variable, to understand the individual and household characteristics and other factors that could influence out-of-pocket health expenditure. Independent variables like households from rural or urban areas, BPL status, profile of household heads like gender, age group, literacy level, occupation, households' health events, poverty status, insurance status, social status, family size, house structure, nearest providers and distance, service providers for in-patient and child birth were taken as independent variables in the analysis (Table 1).

The multiple regression model here for out-of-pocket health expenditure (OOPHE) of the families in the last one year can be written as:

$$Y_{OOPHE} = \beta_1 + \beta_2X_1 + \beta_3X_2 + \beta_4X_3 + \dots + u$$

Where Y_{OOPHE} = Dependent variable which is out-of-pocket health expenditure (OOPHE) of the families in the last one year

- β_1 = Intercept value or constant
- $\beta_2, \beta_3, \beta_4$ etc. = slopes/ coefficients of different regressors or independent variables
- X_1, X_2, X_3 etc. = Independent Variables or Determinants or Regressors of the Dependent Variable which is 'out-of-pocket health expenditure (OOPHE) of the families in the last one year'.
- u = residuals or error terms

The data was further analysed to understand the determinants of Catastrophic Health expenditure (CHE) using logistic regression model (Table-2). For the purpose of this study, WHO (2005) definition of household spending more than 40% of its capacity to pay (CTP) towards health care, was taken as CHE. CTP refers to the non-subsistence expenditure, which is the difference between the total household expenditure (THHE) and the household's subsistence expenditure (SE). Subsistence expenditure is defined as the mean food expenditure of households falling between the 45th and 55th percentiles of the total sample in terms of the share of total household expenditure spent on food. Household capacity to pay was calculated in accordance with the

methodology suggested in [9]. Capacity to pay of the i^{th} household is, therefore:

$$CTP_i = EXP_i - SE_{45-55i}$$

The logit model here for incidence of Catastrophic Health Expenditure in the last one year can be written as:

$$\ln \{P_{CHE}/(1 - P_{CHE})\} = \beta_1 + \beta_2 X_1 + \beta_3 X_2 + \beta_4 X_3 + \dots + u$$

Where $\ln \{P_{CHE}/(1 - P_{CHE})\}$ = Log of odds of incidence of catastrophic health expenditure in the last one year

P_{CHE} = Probability of incidence of catastrophic health expenditure in the last one year

β_1 = Intercept value or constant

$\beta_2, \beta_3, \beta_4$ etc. = slopes/coefficients of different regressors or independent variables

X_1, X_2, X_3 etc. = Independent Variables or Determinants or Regressors of the Dependent Variable which is 'incidence of catastrophic health expenditure in the last one year'

u = residuals or error terms

Table 1. Determinants of out-of-pocket health expenditure

Background characteristics	Coefficients	Std. error
(Constant)	18931.97***	5251.88
HH in rural areas (Rural=1, Urban=0)	1958.64	1681.61
BPL HH	1337.77	1200.72
HH head gender (Male=1, Female=0)	4147.78*	2585.73
HH head age group (HH head with above 60 years is the reference group)		
HH Head upto 40 years of age	-1768.72	1825.09
HH Head between 40 to 60 years of age	-2333.08	1562.51
Literacy level of HH head (Literacy above secondary as reference category)		
No literacy	-579.66	3025.15
Primary level	-473.77	3029.73
Secondary level	-141.28	2914.46
HH head occupation (HH head in service occupation as reference category)		
No work	4094.69*	2525.96
Agricultural or labour related work	4104.10**	1741.48
HH with any member suffering with chronic illness	3698.66**	1778.21
HH with enrolment in any health insurance policy	2199.04	3141.89
HH with any member hospitalised in the reference period	16940.1***	1296.74
HH with any child birth in the reference period	10966.28***	1559.26
Expenditure quintiles (HH with Quintile 5 is the reference category)		
HH in Quintile 1	-22911.52***	2084.72
HH in Quintile 2	-19655.85***	1980.48
HH in Quintile 3	-19319.09***	1917.91
HH in Quintile 4	-16824.78***	1855.91
HH family size (HH with Above 10 members is the reference category)		
HH with upto 5 members	-12719.42***	2347.88
HH between 6 to 10 members	-7823.37***	2102.49
HH social status (General category HH is the reference category)		
Scheduled Tribe HHs	217.48	2358.36

Background characteristics	Coefficients	Std. error
Scheduled Caste HHs	938.23	2183.08
Other Backward Class HHs	-225.65	1390.23
House structure (House with pucca structure is the reference category)		
House with kutchra structure	695.53	1320.17
House with Semi-pucca structure	1142.37	1717.41
Nearest provider (Private provider is the reference category)		
Public provider	-2770.13*	1449.51
Informal provider	-1365.32	1658.34
Distance from the nearest service provider (Above 3 kms as reference category)		
Distance upto1km	3335.38*	1745.25
Distance between 1 to 2 kms	3013.22	2165.20
Distance between 2 to 3 kms	1460.64	2143.03
In-patient service provider (Private provider as reference category)		
Public provider	-9543.53***	3162.76
Delivery service provider (private provider as reference category)		
Public provider	-9033.10***	2135.33
Informal provider	-10464.68***	3197.03
Number of observations	984	
F-Value	18.113	
Prob>F	0.000	
R-squared	0.386	
Adjusted R-squared	0.365	
Durbin-watson statistics	1.894	

***p<0.01, **p<0.05, *p<0.10

Table 2. Determinants of catastrophic health expenditure

Background characteristics	Coefficient (Std. err.)	Exp(B)
HH in rural areas (Rural=1, Urban=0)	.503 (0.210)	1.65**
BPL HH	.144 (.147)	1.16
HH head gender (Male=1, Female=0)	-.251 (.319)	0.78
HH head age group (HH head with above 60 years is the reference group)		
HH head upto40 years of age	-.108 (.224)	0.90
HH head between 40 to 60 years of age	-.132 (.192)	0.88
Literacy level of HH head (Literacy above secondary as reference category)		
Noliteracy	.249 (.367)	1.28
Primary level	.086 (.367)	1.09
Secondary level	.334 (.353)	1.40
HH head occupation (HH head in service occupation as reference category)		
Nowork	-.567 (.314)	0.57*
Agricultural or labour related work	.111 (.213)	1.12
HH with any member suffering with chronic illness	.846 (.232)	2.33***

Background characteristics	Coefficient (Std. err.)	Exp(B)
HH with enrolment in any health insurance policy	.370 (.393)	1.45
HH with any member hospitalised in the reference period	.779 (.159)	2.18***
HH with any child birth in the reference period	-.779 (.194)	.46***
Expenditure quintiles (HH with Quintile 5 is the reference category)		
HH in Quintile 1	-.177 (.256)	0.89
HH in Quintile 2	-.159 (.244)	0.85
HH in Quintile 3	-.073 (.235)	0.93
HH in Quintile 4	.077 (.230)	1.08
HH family size (HH with Above 10 members is the reference category)		
HH with upto 5 members	-.410 (.293)	0.66
HH between 6 to 10 members	-.308 (.263)	0.74
HH social status (General category HH is the reference category)		
Scheduled Tribe HHs	.566 (.293)	1.76**
Scheduled Caste HHs	.547 (.268)	1.73**
Other Backward Class HHs	.352 (.171)	1.42**
House structure (House with pucca structure is the reference category)		
House with kutcha structure	.379 (.162)	1.46**
House with Semi-pucca structure	-.226 (.211)	0.80
Nearest provider (Private provider is the reference category)		
Public provider	-.081 (.178)	0.92
Informal provider	.366 (.204)	1.44*
Distance from the nearest service provider (Above 3 kms as reference category)		
Distance upto1km	-.217 (.215)	0.81
Distance between 1 to 2kms	-.382 (.265)	0.68
Distance between 2 to 3 kms	-.132 (.263)	0.88
In-patient service provider (Private provider as reference category)		
Public provider	-.507 (.391)	0.60
Delivery service provider (private provider as reference category)		
Public provider	.054 (.267)	1.06
Informal provider	.608 (.394)	1.84
Constant	-.454 (.642)	0.64
Number of observations	984	
Significance of Hosmer and Lemeshow Chi-Square test of goodness-of-fit	0.603	
Significance of Omnibus test of the model	0.000	
Nagelkerke R-square	0.186	
-Loglikelihood	1216.196	

***p<0.01, **p<0.05, *p<0.10

4. RESULTS AND FINDINGS

4.1 Surveyed Households' Profile

Out of the total 986 households, 369 households were from Below Poverty Line (BPL) and 617 were from non-BPL categories, based on whether they had a BPL number. Of these, 8%

households were from Scheduled Tribe (ST) community, 10% households were from Scheduled Caste (SC), 59% households were of Other Backward Classes and 23% households were of General categories.

47% households had "pucca" house (wall and roof made of brick and cement) structure, 16%

had “*semi-pucca*” (either wall or roof made of brick and cement) and 37% lived in “*kutcha*” (mud/ thatched) houses. 86% of all households did not have toilet facility. The primary source of drinking water was either a tube well or well and primary fuel of cooking was firewood in most cases, and in some of the cases, cooking gas.

Household heads of 12% families were literate without formal schooling, 16% had completed primary education, 18% had completed secondary education and 44% household heads were illiterate. The primary occupations of the households were agriculture and labour work plus service. Out of total surveyed households, only 16 (1.6%) households were enrolled under publicly financed health insurance (Rashtriya Swasthya Bima Yojna), five households were insured under public sector insurance companies and 13 households were covered by private health insurance. Only five households were entitled to receive medical reimbursements from their employer. The average family size of the surveyed households was 6.7 (Standard Deviation = 3).

4.2 Determinants of Out-Of-Pocket Health Expenditure (OOPHE)

4.2.1 Household characteristics and OOPHE

The analysis showed that male-headed households had significantly higher out-of-pocket health expenditure than female-headed households. Level of education of household-heads, an important human development indicator, had shown a similar trend, where households with heads with higher education level were incurring more out-of-pocket health expenditure compared to their less educated counterparts. However, the association was found to be weak. While OOPHE was found to be high in households headed by better educated male members, it probably shows the access barrier for women headed households, or households with a head who is less educated or illiterate in terms of affordability or psychosocial factors that could be explored further.

It was seen that larger the family size, higher the out-of-pocket health expenditure. Furthermore, households where heads were unemployed or involved in agricultural or labour works, had significantly more out-of-pocket expenditure compared to households where heads were involved in service or business activities. Again, households with heads who were younger in age

had incurred significantly lower out-of-pocket expenditure compared to households headed by persons above 60 years of age; signifying higher health care needs during the old ages. Ironically, such households did not have any financial protection and even when some households were insured, they did not receive any reimbursement to protect them from high health expenditures.

4.2.2 Household expenditure quintile and OOPHE

The monthly per capita consumption expenditure (MPCE) was taken as a proxy indicator for measuring the economic status of the households. Using MPCE, households were divided into five expenditure quintiles with quintile-1 being the poorest and quintile-5 being the least poor or economically better-off. It was found that households in quintile1 to quintile-4 were spending significantly smaller amounts compared to the households in quintile-5. Economic status of households was seen as a significant determinant for OOPHE. Assuming that the risk exposure is similar (which actually is much higher in people from poorer quintiles) high OOPHE among households from higher expenditure quintiles possibly indicates lower care seeking among poorer households. It could be due to economic barriers, lower perception of illness or absence of health facilities that act as a barrier to care seeking.

4.2.3 Health events and OOPHE

History of illness and households' health events showed significant association with out-of-pocket health expenditure. Households with any member suffering with chronic illness, had incurred significantly more OOPHE. Households where any member had been hospitalised in the previous year or households that reported any case of childbirth in the reference period had also incurred significantly higher health expenditure.

4.2.4 Service providers and OOPHE

Services received from different health providers also showed significant association with OOPHE. In cases where in-patient (hospitalisation) services had been sought from public facilities, or where delivery was conducted by a public or informal service provider, the OOPHE was significantly lower than when services had been provided by private service providers. This could be due to higher cost of services in private facilities.

Access to service providers emerged as an important determinant for care seeking behaviour. OOPHE increased with nearness to service providers, showing increased care seeking. Again, households living in closer proximity to public providers had incurred significantly lower out-of-pocket expenditure compared to those living near private providers, perhaps increasing the likelihood of care being received from subsidised public facilities.

4.3 Determinants of Catastrophic Health Expenditure (CHE)

4.3.1 Household characteristics and CHE

Rural residence showed higher chances of CHE compared to households from urban areas (aOR: 1.65, 95% CI 1.10 - 2.49). Similarly, households living in *kuchcha* house structures had a higher likelihood of incurring CHE (aOR: 1.46, 95% CI 1.06 - 2.0). The housing structure could be a proxy indicator of economic status.

Scheduled Tribe (aOR: 1.76, 95% CI 1.0 – 3.13), Scheduled Caste (aOR: 1.73, 95% CI 1.02 - 2.92) and Other Backward Classes (aOR: 1.42, 95% CI 1.02 - 2.01) had significantly higher incidence of CHE compared to the General castes.

Other household characteristics like families living below poverty line (BPL), women-headed households and households headed by persons above 60 years of age or with lower literacy levels or those involved in agricultural or labour work and bigger family size (above 5 members) had higher incidence of CHE, however, the findings were statistically non-significant.

4.3.2 Health event and CHE

Health events in the households were significantly associated with the incidence of CHE. Households where any member was suffering from a chronic illness had higher chance of incidence of CHE (aOR: 2.33, 99% CI 1.48 – 3.67). Similarly, households where any member had been hospitalised in the previous year had significantly more likelihood of incidence of CHE (aOR: 2.18, 99% CI 1.60 - 2.97).

4.3.3 Service providers and CHE

Services received from different health care providers showed some relation with the

incidence of CHE. In-patient treatment received from public facilities showed lower likelihood of incidence of CHE compared to when such services were received from private service providers. However, the relationship was statistically non-significant.

Distance from different types of health service providers had also shown direct relationship with the incidence of CHE. Lower the distance showed lower incidence of catastrophic expenditure, even though earlier it was seen that OOPHE is higher when the households were living closer to the providers. An explanation could be that better off households are more likely to be living near the service providers.

4.3.4 Expenditure quintile and CHE

Expenditure quintiles, though insignificantly, showed inverse relationship with the incidence of CHE. The poorer quintiles had lower incidences of CHE implying that they had sought less care, and therefore such incidences were lower.

5. DISCUSSION AND CONCLUSION

Poor people have higher risk exposure to illness due to a number of reasons like poor living conditions, poor nutritional status or difficult working conditions, or lower access to preventive measures, and one can presume they will have higher health care needs. Yet, as the analysis in this study shows, households from lower expenditure quintiles and women headed households had lower OOPHE, not because they had financial protection from healthcare expenditure, but because they tended to forgo treatment or were forced to seek healthcare from informal providers at a lower cost, thus further increasing the risk of poor health.

Only when services were received from public health care facilities, the OOPHE was lower. This implies that there is a need to invest in strengthening the public health systems to enable the poorest sections of the society to afford health care of acceptable quality. There is also a need to increase the outreach of the public health mechanisms to increase access for people living in distant and hard to reach areas.

OOPHE was high among households headed by person above 60 years, probably indicating the higher care requirements of aging population. The study also found that OOPHE and CHE were very high where a household member was

suffering from any chronic disease. At present insurance coverage is available only for in-patient care, which leaves out-patient care for chronic illnesses that could potentially predispose households to catastrophic expenses or avoidance of any treatment with equally catastrophic consequences. This aspect needs to be brought under the ambit of insurance coverage. OOPHE was also higher if there had been childbirth in the family in the past two years.

Likelihood of OOPHE and CHE increased significantly if any household had faced an episode of hospitalisation. Across the population, the coverage of any health insurance was found to be abysmally low; worse still, none of the insured families that had incurred any in-patient care, had received any reimbursement against the expenditure incurred. Financial protection net needs to be designed in a manner that enables people, particularly these vulnerable sections, to seek quality health care.

Families living in rural and remote areas or among scheduled castes or scheduled tribe families had higher incidences of CHE. Distance from any health provider also increased likelihood of CHE. It could possibly be due to delay in identification of ailment and delay in seeking treatment, leading to complications.

In light of these findings, it is strongly recommended that the network of public health care be strengthened, with adequate investment in manpower, medicines and infrastructure. The coverage of health insurance needs to be increased and their performance measured not only in terms of coverage, but also from the perspective of whether they are reaching the poorest sections, and the extent to which claims are being settled.

While financial protection from health expenditure should remain the overall objective, there is a need for specific targeting of households from the at-risk population such as scheduled tribes and scheduled castes, women headed households, old age people and people from the poorer sections of the society. The Rashtriya Swasthya Bima Yojna is a step towards addressing equity and efficiency in health care finance by providing financial protection from health expenditure to the resource poor households from secondary care. More such initiatives would be required to protect the resource poor households from financial catastrophe and improve their care seeking.

One methodological limitation of the study would be that being a cross-sectional study, it did not capture the whole range of expenditure throughout the year particularly for out-patient care. Second, as the study was retrospective in nature, we might have missed some cases of hospitalisation. Response bias is possible particularly in the cases of collecting treatment costs as we took responses from the family members only, and couldn't check with the hospital records.

ETHICAL APPROVAL

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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