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Determinants of healthcare forgone: a case study of rural areas in the North East Region of India

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Abstract

Introduction: Out-of-Pocket (OOP) spending is a prominent health care payment mechanism in India and other developing countries. However, it is more common amongst the lower income group of people especially in the rural areas. And due to this type of payments mechanisms (OOP) many households incur catastrophic payments and possibility of falling into poverty trap is high. To avoid such an impoverishment situation, some households forgo the needed health care when get health shocks. This study analyses the various issues related to treatment forgone and its major determinants.
Data and Methods: The empirical analysis is based on the primary survey conducted in the last quarter of 2015 in rural Chirang districts of Assam (India). It is based on the data collected on OOP payments, income of the households, and treatment forgone due to lack of money or unbearable cost for the last one year preceding the survey date. The analysis is descriptive as well as based on binary logistic regression model.
Results/Application: It has been found that the households with lower income groups are more likely to forgo treatment than the higher income groups. The treatment forgone by the households whose annual income is up to ₹75,000 is higher relative to the income group greater than ₹2,00,000 (OR=15.96, p< 0.001), and the households in the income group of between ₹75,001-2,00,000 relative to the income group of greater than ₹2,00,000 (OR=8.86, p<0.01). The results also show that the households which incurred catastrophic OOP expenditure on health care are more likely to forgo health care subsequently. Population size of the households also plays an important role in determining the treatment forgone. Female headed households are less likely to forgo treatment than the male headed households, though the result is not statistically significant.
Keywords: Rural Areas, Medical Care forgone, Insurance, Out-of-Pocket, North East Region.

1. Introduction

Health policy makers have long been concerned with health care requirements of poor households. In spite of the efforts, however, there are possibilities that ill health lead to Out-Of-Pocket (OOP) spending for financing health care. In [1] certain cases this may lead to catastrophic payments and subsequent impoverishment. To avoid such an unwanted circumstance many people may forgo the medical treatment. This paper analyse some of the issues related to treatment forgone and its major determinants. The increasing dependence on Out-Of-Pocket (OOP) spending for financing health care will push the incidence of underuse of needed health care services, particularly by the lesser income group households. Treatment forgone can adversely impact health status because treatment forgone or delay can aggravate the severity of health problems and then reduce the health status. Furthermore, treatment forgone could lead to increased use of health services at the later point in time, thus inflating health expenditure [2-3]. Many lower income households at times are unable to seek treatment due to lack of money and which is aggravated by lack of insurance facilities. People pay from their pocket in the absence of any health care protective mechanism, but when series of sickness occurs, they have to forgo some treatments due to insufficient income, though seeking treatment was inevitable. However, this relinquishment on needed health care services can lead to delayed treatment and further worsen the health status. Thus, eventually this implies higher costs for individuals and even for the health care system [4-6]. This is, however, a common phenomenon in the rural areas of the less developed countries like India.

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Though, most people do not like this to happen, it is adamantly recurring in many households. In [7] found a fundamental connection between financial burden and cost induced relinquishment of health care services. It was found that the chronically ill, people with lower income and individuals with depressive symptoms spent a higher part of their income on OOP payments and forwent health care services more frequently at the same time. There are many studies done on OOP expenditure and its catastrophic and impoverishing effects [8-10]. There are some studies on treatment forgone [1,7,11]. Hitherto, however, there is no specific study on treatment forgone in India. Therefore, this study captures this phenomenon in the rural areas of the north eastern part of India. The surveyed area is in the rural areas of Assam located in the north east part of India. In this paper the Section two deals with data and methodology followed by section three devoted to results and major findings; the section four is the discussion and last section is the concluding remarks.

2. Data and Methodology

1. Data

The data used in this analysis is the primary data collected from the field survey in 2015. Data have been collected with a set of questionnaire. Questionnaire has been designed keeping a standard model of questionnaire followed by USAID (United States Agency for International Development) which was designed by MEASURE DHS/ICF International (Out-of-Pocket Expenditures Module) in the background. The field survey was conducted during year 2015, in the rural areas of Chirang district of Assam, which is in the north eastern part of India. For the livelihood people mainly depend on agriculture (more than 70%), and other activities like fishing, small businesses, construction works, government employees etc.

2. Statistical methods

Forgone treatment is defined as frequency of self-report of forgone medical care when person was ill and needed medical care for the last one year proceeding the survey day. It was assumed that certain factors like place of residence, income of the household, population size of the household, gender of the head of household, literacy status of the wife of household (if the head of the household is male), and the households which had already catastrophic OOP on health care, determine the treatment forgone when needed health care. The data were also collected for the OOP payments for the households. The unit of analysis is the households.

To estimate the catastrophic OOP spending two approaches are basically applied in the literature. The first approach sets the threshold in terms of income. This approach considers the OOP payments as a proportion of income (X). That is (OOP/X). The threshold usually varies from 2.5% to 15%. The second approach is based on ability-to-pay. This approach considers OOP payments in terms of a measure of ability to pay (y), such that (OOP/y) where $y = X-S_{exp}$. The S_{exp} is subsistence deductions, while X is income or consumption expenditure. However, expenses allowed in S_{exp} to compute the ability to pay have been a subject of debate in the literature. In [12] this study, we estimated the catastrophic spending of the households on health care by using the first method. The method is given below.

CE= (OOP/I)*100

Where CE is the catastrophic expenditure on health care, OOP is the out-of-pocket expenditure on health care and I am the annual income of the household. A household is said to have incurred CE if its expenditure is equal to or more than 10%. Thus, with the help of aforementioned variables we formulated a binary logistic regression, which is as follows:

$Y = \beta 0 + \beta_1$WIFEEDU+ β_2PHCPROXIMITY+β_3INCOMECATE+ β_4HOUSEPOPSIZE + β_5HEADGENDER + β_6CATASTROPHICHOUSE+ ε

Where Y is a dummy variable and equals one if a household forgo treatment, and equals zero otherwise. The independent variables are education of the wife of head of the family (WIFEEDU), proximity of the household to the PHC (PHCPROXIMITY), Income category of the total annual income of the household (INCOMECATE), population size of the household (HOUSEPOPSIZE), gender of the head of household (HEADGENDER), and households which had catastrophic OOP spending (CATASTROPHICHOUSE). The term ε is the unobserved determinants of treatment forgone which is a random error term.

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3. Results and Findings

Table 1 describes the descriptive statistics of the households on the basis of categorisation of independent variables.

Table 1. Descriptive statistics of independent variables of treatment forgone

Independent Variable		Frequency	Percent
Household proximity to the PHC	Far (beyond 5 km)	288	50.0
	Near	288	50.0
Income category	Up to 75,000; Lower Income Group	285	49.5
	75001 to 2,00,000; Middle Income Group	59	10.2
	Greater than 2,00,000; Higher Income Group	232	40.3
Household population Size	>=Seven	68	11.8
	Five to Six	341	59.2
	One to four	167	29.0
Catastrophic household	Catastrophic	194	33.7
	Non-catastrophic	382	66.3
Family Head Gender	Female	18	3.1
	Male	558	96.9
Literacy status of the wife of Head of the household	Illiterate	329	57.1
	Literate	247	42.9
Total		576	100.0

Source: Field Survey

Table 2 shows that 74 (12.8%) out of 576 households forwent medical treatment. The descriptive statistics of the medical treatment forgone by the households is shown in Table 3.

Table 2. Medical treatment forgone

Treatment forgone	Frequency (households)	Percent
No	502	87.2
Yes	74	12.8
Total	576	100.0

Source: Field survey

It is seen that out of 18 female headed households only 3 households forwent treatment as against 71 households out of 558 male headed households. 54 households out of 329 households with illiterate wives forwent treatment as compared to 20 households out of 247 households with literate wives. This indicates that female education plays an important role in seeking medical treatment apart from other factors. For instance, out of 74 households which forwent treatment, 73% is the households with illiterate wives.

Proximity of the households to public health centre (primary health centre, in this case) seems to have no role in treatment forgoing. Income of the households plays an important role in household's capacity to health care utilization. For instance, 87.8% of the households which forwent treatment were in the income category of up to ₹75,000, as against 8.1 %and 4.1 %households for income category of ₹75,001-2, 00,000 and ₹2, 00,000 respectively. Thus, poor households forgo the medical treatment more than the non-poor households. If we look from the perspective of the income source of the households, it is the farming households which forwent highest with 67.6%, followed by households which depend on wages from daily labour with 23%. It is interesting to see that none of the households with pensioners (5 households) forwent treatment. Perhaps, this could be because this section of household's has sufficient savings apart from regular flow of pension to finance the medical treatment. Furthermore, 56.89% households which forwent treatment were households which incurred catastrophic households on OOP as compared to non-catastrophic households. There is difference between different population size of the households and treatment forgone. For instance, 33.8 %of the households which forwent treatment were in the population group of one to four as against the 51.4% households from population group of five to six. It is only 14.9 %from the group of greater than six.

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Thus, the households with the population size of five to six forwent more than the other groups we have seen that female headed households forgo lesser than male headed households; households with literate wives forgo lesser than the households with illiterate wives; households proximity to the rural public health centre (PHC) seems to be irrelevant with regard to treatment forgone due to cost of treatment; the lower income groups forgo higher than the middle and higher income groups; and the households which incurred catastrophic OOP expenditure is more likely to forgo treatment compared to the non-catastrophic households.

Table 3. Descriptive statistics of the medical treatment forgone

Variables (Various Groups)		Frequency of various groups	Treatment forgone	
			Incidence by various groups	Total*
Gender of Head of Household	Female	18	3(4.1)	74 (100)
	Male	558	71(95.9)	
Literacy status of the wife of head of the household	Illiterate	329	54(73.0)	74 (100)
	Literate	247	20(27.0)	
Household proximity to the PHC	Far (beyond 5 km)	288	34(45.9)	74 (100)
	Near	288	40(54.1)	
Income Category	Up to 75,000	285	65(87.8)	74 (100)
	75001 to 2,00,000	59	6(8.1)	
	Greater than 2,00,000	232	3(4.1)	
Household status	Poor	288	68(91.9)	74 (100)
	Non-Poor	288	6(8.1)	
Primary income source of the household	Salaries and wages (regular)	78	2(2.7)	74 (100)
	Retirement income (pension)	5	0(.0)	
	Wages from daily labour	46	17(23.0)	
	Business	157	5(6.8)	
	Sale of agri-produce(farming)	290	50(67.6)	
Medical OOP Catastrophic Household	Yes	194	42(56.8)	74 (100)
	No	382	32(43.2)	
Household population size	One to four	167	25(33.8)	74 (100)
	Five to six	341	38(51.4)	
	Greater than six	68	11(14.9)	

Source: Field survey

*NOTE: The figures within parenthesis are in percentage; * 74 number of households forgone treatment out of 576 households (i.e., 12.8%)*

1. Determinants of treatment forgone

Table 4 depicts the results of multivariate logistic regression and identifies the determinants of medical treatment forgone. The results highlights that the households with literate wives are less likely to forgo treatment than the households with illiterate wives (Odds Ratio (OR) =0.49, at p<.05).

Households with lesser income are more likely to forgo treatment due to cost constraint compared to higher income group households. The treatment forgone by the households whose annual income is up to ₹75,000 is higher relative to the income group greater than ₹2,00,000 (OR=15.96, p<0.001), and the households in the income group of between ₹75,001-2,00,000 relative to the income group of greater than ₹2,00,000 (OR=8.86, p<0.01). The results also show that the households which incurred catastrophic OOP expenditure on health care are more likely to forgo health care. In other words, the non-catastrophic households are less likely to forgo medical treatment than the catastrophic households (OR=0.62, p<0.10). Population size of the households also plays an important role in determining the treatment forgone. For instance, the households which has the family size of five to six forwent less than the family size of equal to or more than seven (OR=0.36, p<0.05). Likewise, the households which has the family size between one to four also are less likely to forgo treatment compared to the households with seven or more, however, though not statically significant. It is surprising to see that female headed households are less likely to forgo treatment than the male headed households, though the result is statistically not significant. The male headed households likely to forgo care more relative to female headed households.

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Studies have found that the female headed households seek health care higher than the male headed households, which is attributed to the fact that women are risk averse and they prefer household members to be attended by health professionals during illness. For instance, [13] found women utilizing health care services more frequently than men. They found that women use more prescription and over-the-counter medicine, they demand more vitamin supplements, and they utilize routine screening exams more frequently. The proximity of the households to the public health care centre is not found significant determinant of treatment forgo due to unbearable cost of treatment.

Table 4. Logistic regression results on determinants of treatment forgone

Variable		Beta	Exp(B)/ORs	S.E.	*"P"*
Head Gender	Female	1			
	Male	.217	1.243	.280	.747
Family Head wife's education	Illiterate	1			
	literate	-.707	.493	.321**	.027
Village proximity to PHC	Far (beyond 5 km)	1			
	Nearby	.253	1.288	.269	.348
Household's Income Category	Greater than 2,00,000	1			
	75,001 – 2,00,000	2.182	8.860	.731***	.003
	Upto 75,000	2.770	15.963	.640****	.000
Catastrophic household	Catastrophic	1			
	Non-catastrophic	-.486	.615	.280*	.082
Household's Size	>=Seven	1			
	Five to Six	-1.015	.363	.433**	.019
	One to four	-.589	.555	.461	.201
Intercept		-3.121	.044	1.005***	.002
Psuedo R^2 (NagelkerkePsuedoR^2)	0.24				
N	576				

*Note: 1=Reference category; ORs=Odds Ratios; ****p<0.001, ***p<0.01,**p<0.05, *p<0.10*

4. Discussion

The focus of this study is the treatment forgone due to unbearable cost or lack of money. In all 74 households out of 576 households surveyed, reported that they had forgone treatment. The education of the wives of the households is an important determinant of the treatment forgo, that is, literate wives in the households will help the households to seek treatment when needed care. Thus, this calls for emphasizing on female education in the rural society. In [14], found that educated mothers are more likely to utilise institutional health care whether or not such facilities are available within the village. The mission of *Beti Bachao Beti Padhao* launched in India in 2015 is a big step in the right direction. Swami Vivekananda once said, 'I ask you all so earnestly to open girl's schools in every village and try to uplift them. If the conditions of women are raised, then their children will, by their noble actions, glorify the name of the Country'. People with higher income and people with health problems spend higher amount on OOP payments. The positive relationship between income and amount of OOP payments is in line with economic demand theory, whereby, healthcare is classified as a normal good [15]. We found the negative relationship between income and treatment forgone and this is most pronounced for the lowest income group. Further, the catastrophic households are also more likely to forgo treatment than the non-catastrophic households. This shows that lower income groups are more likely to forgo treatment and more likely to incur catastrophic OOP payments compared to the higher income groups. Further, the households with higher population size forgo treatment more than the other lower income groups.

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5. Conclusion

In many studies it has been found that relinquishment of treatment needed deteriorate the health status of the patients. Therefore, it is a serious phenomenon when the needed care especially the chronic diseases are been delayed or relinquished. Lesser income groups and illiterate households face catastrophic expenses on health care and they are also more likely to forgo treatment. Thus, this relinquishment of needed treatment could deteriorate the health status of people. Further, this delayed treatment could inflate the treatment cost in later episode for both individual as well as for the health care system. Thus, the policy makers should focus on the health care financial needs of the poor people in the rural areas. The limitation of this study is that, it doesn't capture whether the forgone treatment had deteriorated the health status of the individuals, due to the fact that, most of the households which forgone treatment were poor and uneducated and couldn't assess their health status appropriately. Nevertheless, the results of this study would be of help for the policy makers in that there are many households in the rural areas which forgo treatment due to lack of money in particular, and due to necessity of huge OOP payments in general. Thus, policy makers can come up with some proactive measures to help the lower income people to make provisions of their health care requirements in an appropriate manner. The Pradhan Mantri Jan Arogya Yojana launched by the government of India in 2018, also known as Ayushman Bharat and which is the India's commitment to Universal Health Coverage will be a great relieve for the poor households if implemented effectively. This will also go a long way in facilitating the achievement of the ambitious goals of the Sustainable Development Goals of the United Nations in which India is a signatory.

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