

Do Information Differentials and Confidence in Medical Institutions Influence Out-of-Pocket Expenditure on Healthcare in India?

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Abstract

Purpose: This paper investigates the dynamics of higher out-of-pocket expenditure on healthcare in India and to identify their responsible factors with a focus on confidence in medical institutions and information differentials in health care sector.

Design/ Methodology/ Approach: The analysis is based on IHDS-I (2004-05) and IHDS-II (2011-12) database by applying the log-linear regression method. An information index is derived using variables through the normalized Principal Component Analysis method. Later multinomial logit regression technique is applied to find out the proportion of individuals accessing government as compared to private hospitals.

Findings: Results identify that the factors like location, education, age and caste of the respondents play significant role in determining the out-of-pocket expenditure on health care in India. Further, information differentials and confidence in medical institutions among individuals also play important role.

Research limitations: The availability of digital record regarding patient's feedback and updated database on behavioural aspects on health care in India is very limited.

Practical Implications: Findings suggest policy-based interventions specifically on better dissemination of information through ICT pertaining to health care. This also prompts for appropriate regulation by Government on hospitals, so that confidence among patients as well as information dissemination will be improved along with a decline in out-of-pocket expenditure on health care.

Originality/ Value: Previous studies have not yet explored in details of the role of confidence in medical institutions and information differentials among patients.

Key words: Health expenditure, OOPE on health care, information differentials, confidence in hospitals

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I. Introduction

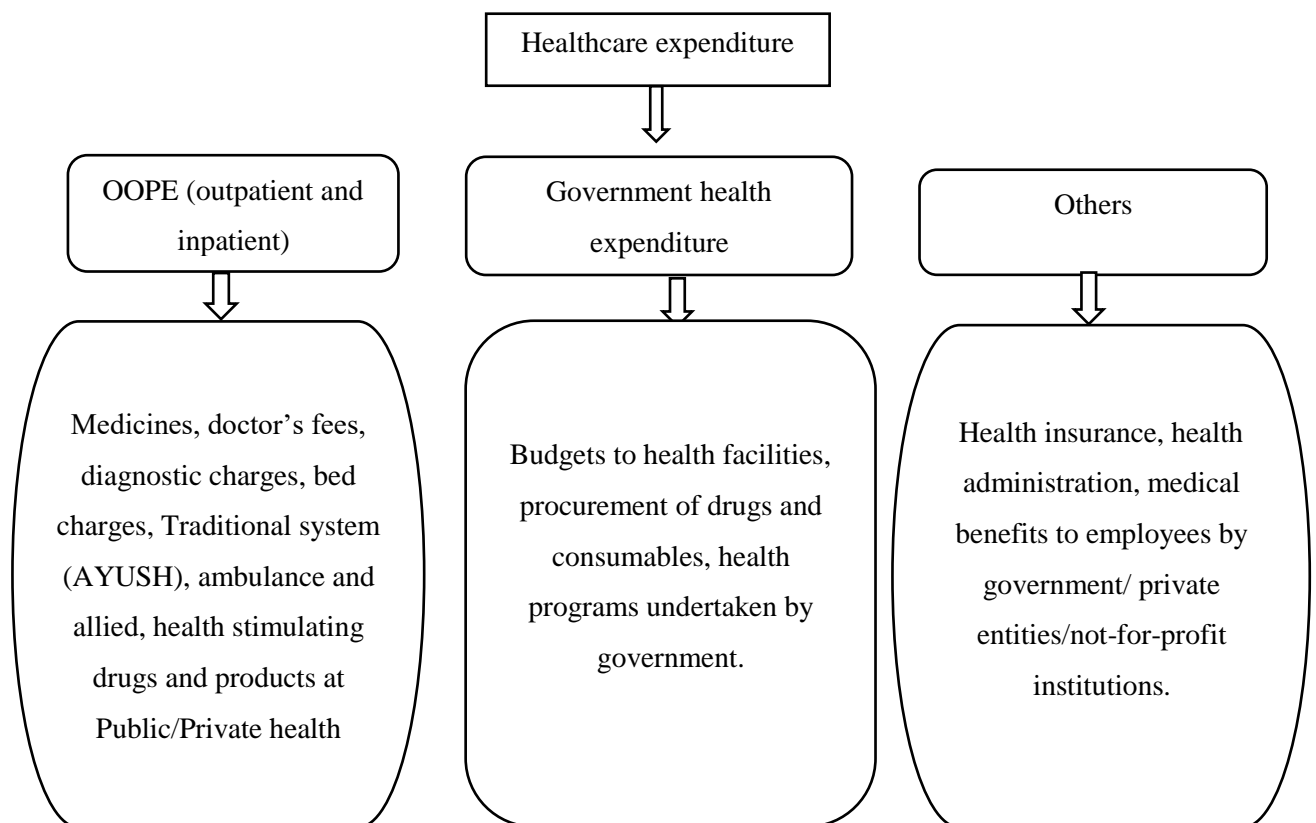
Health care expenditure in India has been a great concern these days and has taken significant place in discussions and discourses. With increase in the number of diseases on one hand and the existing high level of poverty in India on the other, health care expenditure of individuals has accentuated to a significant level. According to the National Health Account Estimates Report, 2014-15 (MoHFW, Government of India, 2017), out of the current health expenditures of India, share of households (including insurance) is about Rs 3,20,262 crores (i.e. 71 percent and OOPE being 67 percent). This is much above the world average of 32 per cent in 2015 as per the Global Health Observatory Data (World Health Organization, 2015). The World Bank report show that the ratio of Out-of-Pocket medical expenditure to the total private medical expenditure in the year 2009 was 86.4 percent in case of India and 25.1 percent in the case of United States, 29.6 percent in the case of South Africa (Forgia and Nagpal, 2012).

Literatures suggests some of the factors like age, education, location, income, type of health facilities (public or private) and information differentials responsible for the increase in Out-of-Pocket Expenditure on health care (OOPEHC). Information differential is one of the crucial factors because all other factors are directly or indirectly affected by information asymmetry. Differentials in information is a phenomenon present almost in every other sector. Unlike other sectors, it has a special significance in health care sector because of its nature - irregular and unpredictable. Both the incidence and treatment of a disease is very unpredictable and at times, risky. Some of the diseases even require immediate treatment and the concerned patient cannot even think of spending time for collecting information which further raise higher Out-of-Pocket Expenditure (OOPE). Nonetheless, information dissemination is a major constraint for the lower income group of the society. The public spending in health care is very low in India. This is only 1.13% GDP for the year 2014-15 as per the National Health Account Estimates Report (2017). However, a number of health schemes and facilities are presently operational in India by the government but those facilities are not being effectively accessed by the marginalized section of the society specifically due to lack of information ^[i]. Therefore, this paper investigates the dynamics of OOPEHC and attempts to explore the underlying reasons for higher OOPEHC in India by emphasizing the role of confidence in medical institutions and access to information.

This study deals with the following research questions:

- (i) Does the magnitude of OOPEHC vary across age groups, location, income categories, gender and access to information?
- (ii) What are the significant factors which influence OOPEHC?
- (iii) Does confidence in medical institutions lead to variation in OOPEHC?
- (iv) Does access to information influence OOPEHC?
- (v) What are the factors that influence the patients to access the private or public health facilities?

Defining Health Care Expenditure



Now, health expenditures of the household can be bifurcated into direct expenditures (OOPE) or indirect expenditures (prepayments as health insurance contributions or premiums). OOP is the direct burden of medical costs that households bear at the time of availing healthcare services. The present study considers out-of-pocket expenditure on healthcare in India and the various factors responsible for higher OOPEHC.

This paper covers the following sections. Section II deals with review of existing literature and the gaps. Section III deals with data and methodology with relevant variable descriptions. Section IV identifies the dynamics of health care expenditure in India and the sub-section discusses briefly on confidence in medical institutions and information differentials. Section V

includes model selection and analysis of regression results. The sub-section identifies the significant factors influencing OOPEHC (OOPE on health care). Another sub-section identifies the factors that influence the patients to access private or public health facilities. Section VI concludes with discussion and suggestions in line with the findings of this study.

II. Existing Theory and Gaps

OOPEHC can be divided into medical and non-medical expenditures. Medical expenditures include expenditure on purchasing medicines, doctor's fee, diagnostic test, etc. The non-medical health care expenditures include expenses on transportation, food, lodging and even bribe payments to the health workers. (Basumatary & Srivastav., 2017)

The prevailing health system in India is largely dependent on OOPEHC unlike many countries in the world (Reddy et al., 2011). Earnings of the household and their personal savings are the major sources of payment for illness in India (Misra et.al., 2013). But the marginalized section of the society, particularly low and middle-income categories do not have adequate earnings nor savings. The burden of expenditure on health exceeds income by proportion defined as catastrophic expenditure. This catastrophic healthcare expenditure^[iii] compels them to borrow money from other sources. They are eventually trapped into debt and abject poverty. This is nearly seven per cent of the population who are pushed below the poverty line in India because of high burden of OOPEHC (Shahrawat and Rao,2012; Garg and Karan,2009; Kumar et al., 2015; Doorslaer et al,2006). OOP medical expenditure is regressive in nature. It imposes inequity and thereby owing to a greater burden on poor families with bigger family size and lower annual per capita income than better off families. Poor used to have worse health condition than non-poor as they lack access to resources, particularly monetary resources and low self- health awareness levels (Misra et al, 2013).

OOPEHC vary across regions, states, and also across households. The location where the patients reside signify their standard of living and it has linkage on medical expenses (O'Donnell et al.,2005). In fact, older population, particularly those living in rural areas had higher OOPEHC than urban areas (Pandey et al, 2018). Similarly, in urban areas, private and higher quality health services are more easily accessible compare to the rural areas. (Basumatary & Srivastav, 2017).

Age and OOPEHC are directly correlated (Pascual-Saez et al.,2017). The out-of-pocket payment for older people is higher compared to the younger population, particularly for the period 1995-96 and 2014 (Pandey et al 2018). Moreover, older population have higher

OOPEHC as compared to other age group. (Kim et al., 2005; Mohanty et al., 2014; Kumara and Samaratunge, 2016; Baird, 2016).

Education plays an important role in determining the variation in OOP expenditure. Literacy level is significantly associated with the burden of OOP payment (Pandey et al, 2018). Education improves the analytical abilities of an individual. But the poor people cannot afford good education and thus have less knowledge about medical facilities and their availability.

Despite many efforts since decades regarding provision of free public health care services, India's national health expenditure studies consistently reveal high levels of OOPEHC (Berman, 1997). Most of the ambulatory illness care need private providers on an average across the states and this results in over 56 percent of total OPEHC owing to private providers. (Berman, 1998). Access to private hospitals has been increased along with an absence of medical insurance and rising cost of medical care. These are the major reasons for poverty and inequality including direct debt in India (Balarajan et al., 2011). OOPE in private hospitals was more than public hospitals from seven percentage points in 1995-96 to 18.0 percentage points in 2014 in India (Pandey et al., 2018; Bhat and Jain, 2006). Studies show that declining quality and inaccessibility of the public health system coupled with the growing dominance of the private health sector have resulted in the poor resorting to private care, even though they are interested in seeking care from the public sector (Gwatkin, 2000.)

Almost 63 percent of clinicians practising in rural India have inadequate medical training (Rao et al, 2011, 2012). This information usually remains unreported for the public domain and therefore creates information differentials among public. People living in rural areas have less information about the quality of doctors. Also, there is inherent nature of informational inequality among physicians and patients. Arrow (1963) has identified "informational inequality" between patients and physicians and the imperfect information provided by physicians which result in market failure, specifically "a failure to reach optimal in the sense of pareto". Information is a commodity which has both a cost of production and transmission. Thus, it is not equally distributed to all sections of the society. (Deborah Haas-Wilson, 2001). There is a common understanding that the doctors have more relevant information than that of the patients. The personal motivation of the doctor may end up ordering extra tests and prescribing expensive drugs in order to earn more money, to increase income in order to receive more favour from pharmaceutical companies; and also using reciprocal referrals to specialists in other fields, to increase income (Shmanske, 1996). There is also trust issues prevailing in a doctor – patient relationship which shows lack of transparency in the system. Arrow (1963)

discusses the importance of trust in the doctor-patient relationship. The trust factor also arises because the patient wants the doctors to keep their personal medical information secure and confidential (Small et al, 2017). Doctors, both in government and private health care sector, prescribes costly medicines and laboratory test for their own financial commissions. They even sometimes go to the extent of prescribing unnecessary medicines. Therefore, corruption is prevalent in health care industry (Paul and Bhatia, 2016). Previous studies have not yet highlighted qualitative analysis of OOPEHC in Indian context. The behavioural mapping of individuals is very essential to understand the dynamics behind the higher OOPEHC in India.

By health care Institutions, we mean both government and private medical institutions. Trust and confidence play a vital role in doctor-patient relationship. The doctors and other health professionals were the most authoritative and used sources of healthcare information. But this relationship has been deteriorating since corruption is prevailing in the health care industry. (Shmanske, 1996; Paul and Bhatia, 2016). This type of corruption is one of the main reasons for high OOPEHC.

III. Data and Methodology

Data is extracted from India Human Development Survey, (IHDS I and IHDS II). This is a nationally representative survey of households jointly organised by the National Council of Applied Economic Research (NCAER) and the University of Maryland. IHDS I surveyed 41554 households in 1503 villages and 971 urban neighbourhoods across India. In IHDS II, 42152 households were interviewed. Cross tabulation of each independent variable with the dependent variable is made taking into account IHDS II, whereas in regression analysis we have incorporated both IHDS I and IHDS II. OOPEHC is divided into quintiles for cross tabulation analysis. The categories are: very low, low, moderate, high and very high. The survey has gone through a detailed analysis including the information related variables. Three regression models have been specified given the nature of data. The log-linear regression method is applied in model 1 and model 2 using the IHDS – I and II data respectively. Later, multinomial logit regression ^[iii] is applied to find out the likelihood of individuals accessing government as compared to private healthcare facilities. These are derived using STATA 12. PCA technique is applied to derive the information index based on five important indicators (refer Table 1). The dependent and independent variables are explained in the following table:

Table 1: Data and variables Description

Variables	Description	Variable Type	Expected Sign
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Dependent variable (model 1 and model 2)	Out of Pocket expenditure in health care (2004-05, 2011-12). The variable Ln OOPE is in log form and it is calculated by adding the variables medical outpatient (total value) and medical in-patient (total value) minus the insurance expenditure.	Ratio scale / continuous	
Dependent variable (model 3)	Access to medical institutions (Government vs Private)	nominal	
Independent variables			
Age group	It is divided into three categories according to the census report. The categories defined as (0-14) years, (15-59) years and (60 and above) years. The first category (0-14) years is taken as reference category. The second category is taken as 1 and third category as 2.	ordinal	(-)
Location	Location is divided into 4 categories. Metro urban (0), other urban (1), more developed village (2) and less developed village (3). Metro urban is the reference category.	categorical	(-/+)
Household expenditure per capita	This variable is divided into 5 quantiles. The first quantile (0) is taken as reference category. The second quantile (1), the third quantile (2), the fourth quantile (3) and the fifth quantile (4).	ordinal	(+)
Education	This variable is divided into four categories. Primary (0) (up to class 5), Secondary (up to class 10), Higher secondary, Graduate and more. Primary education is the reference category here.	ordinal	(-)
Caste	The categories are Brahmin/General/forward (0), OBC (1) SC (2), ST (3), Others (4). Brahmin/General/forward is taken as reference category.	nominal	(+/-)
Gender Dummy	Male (1) and Female (2). Male is the reference category.	Dummy	(+/-)
Husband's education	This variable is divided into four categories. Primary (0) (up to class 5), Secondary (up to class 10), Higher secondary, Graduate and more. Primary is the reference category here.	ordinal	(+/-)
Confidence* in Government hospitals	The three categories are- Hardly any confidence (0), only some confidence (1), Great deal of confidence (2). The first one is reference category.	categorical	(+/-)
Confidence in Private hospitals	The three categories are- Hardly any confidence (0), only some confidence (1), Great deal of confidence (2).The first one is reference category.	ordinal	(+/-)
Information Index	It includes five variables: i) Reading Newspaper- It has 3 categories: Never, sometimes and regularly. ii) Owns mobile -It has two categories: Yes and No. iii) Internet- It has 2 categories: No and Yes iv) Acquaintance with doctors among caste/community/relatives- It has 2 categories: Yes and No v) Acquaintance with doctors outside caste/community/relatives- It has 2 categories: Yes and No. Information Index has 3 categories- low (0), mid (1) and high (2). The category low (0) is the reference category.	Categorical (ordinal) based on PCA	(-)
EAG Dummy	All the states are divided into two parts- EAG and NON-EAG states.	dummy	(+)

	The category NON-EAG states is the reference category.		
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Source: Authors' calculation using India Human Development Survey

*Note: The question asked in IHDS related to confidence- Would you say you have confidence in government hospitals ? Options were: A great deal of confidence=1, Only some confidence=2. Hardly any confidence at all= 3. The same set of options were for private hospitals also.

IV. Dynamics of Health Care Expenditure in India

OOPEHC Differentials and Socio-Economic classification

Cross tabulation between age and OOPEHC is observed. As age increases, OOPEHC also increases significantly. But in the age-group (>60) this is less as compared to the other two categories. Location is found to have impact on health care. The table 2 indicates that residents of less developed village have very high OOPEHC (36 per cent) in comparison to metro urban (6.93 per cent) population. This is because people of less developed areas face more problems in accessing health facilities. They also have high travel expenses and need much more time to access hospitals than the people residing in urban areas. (Basumatary & Srivastav., 2017) Further, if the OOPEHC of both more developed and less developed villages combined then it is almost 66 per cent of the total. This implies that most of the OOPEHC is from the villages and remote areas and not from developed or metro cities.

Table 2: Socio-economic Classification of OOPEHC in India (in percent)

Socio-economic classification		OOPE in Quintile					Total
		Very low	Low	moderate	high	Very high	
Age group	Age (0-14)	25.92	29.99	29.09	28.56	26.67	28.05
	age (15-59)	63.76	60.42	60.47	60.52	60.97	61.23
	age >60	10.33	9.60	10.44	10.92	12.35	10.72
Location	Metro urban	7.36	6.45	7.75	6.69	6.47	6.93
	Other Urban	27.74	26.00	27.28	26.41	27.93	27.06
	More Developed Village	31.05	30.02	27.62	29.16	32.07	30
	Less Developed Village	33.85	37.54	37.35	37.74	33.53	36
Caste	Brahmin / general/forward	25.26	26.48	29.75	28.53	30.11	27.99
	OBC	39.61	38.93	39.98	42.25	44.86	41.11
	SC	20.74	23.85	21.29	20.62	19.07	21.14
	ST	13.08	9.82	7.78	7.23	4.48	8.51
	Others	1.32	0.91	1.20	1.36	1.47	1.25
Gender	Male	50.11	49.83	49.86	49.75	49.93	49.9
	Female	49.89	50.17	50.14	50.25	50.07	50.1

Household expenditure per capita	First quantile	26.46	28.19	20.75	17.47	6.61	19.98
	Second quantile	20.09	23.48	21.81	21.57	13.03	20.02
	Third quantile	18.4	19.22	20.79	21.13	20.55	20
	Fourth quantile	18.08	16.36	18.76	21.08	25.86	20
Education	Primary	51.42	56.85	55.02	54.70	52.35	54.08
	Secondary	34.40	32.16	32.70	32.63	33.35	33.05
	Higher secondary	7.63	6.38	6.93	7.18	7.84	7.19
	Graduate and above	6.55	4.62	5.35	5.50	6.46	5.69
Husband's education	Primary	82.68	84.25	82.65	83.21	81.34	82.84
	Secondary	13.38	12.61	13.74	13.38	14.52	13.52
	Higher secondary	3.34	2.68	3.07	2.71	3.74	3.1
	Graduate and above	0.6	0.46	0.54	0.71	0.4	0.54

Source: Authors' calculation using India Human Development Survey II

Also, males have almost similar OOPEHC as females. In table 2, household expenditure per capita is considered as a proxy for income. The data show that irrespective of household belonging to different income quintiles, the OOPEHC is almost similar (the range lies between 19- 20 per cent). This implies that even people in the lower quartile of household expenditure spend relatively the same as that of higher income group in percentage terms. Thus, OOPEHC is regressive in nature.

Education has a crucial role to play in the higher OOPEHC. This is in line with the existing literature. It is argued that literacy level is significantly associated with the burden of OOPP (Pandey et al, 2018). In table 2, we find that people with education up to primary level has the highest (i.e. 54.08 per cent) of the total OOPEHC. As the level of education increases, OOPEHC decreases to a significant level (i.e. 5.69 per cent of total OOPEHC). More education empowers people with more information and they can analyse the situation and spend accordingly. Thus, OOPEHC decreases with better education ^[iv]. Education of head of the family/ husband is also important for decision making in the household, particularly in health-related issues.

OOPEHC and Confidence in Medical Institutions

Confidence in the institutions of direct health care providers determines health care expenditure to a significant level (refer table 1). The data in table 3 reveals that as the intensity of trust and confidence increases, OOPEHC increases in both government and private hospitals. (Shmanske, 1996). Patients often take the doctor's suggestions without questioning them. This may lead to increase in OOPE (Paul and Bhatia, 2016).

Table 3: Confidence in hospitals or doctors and OOPE on health care differentials

Confidence in hospitals and doctors to provide good treatment		OOPE in quintile					Total
		Very low	low	mid	high	Very high	
Govt.	A great deal of confidence	56.68	51.64	54.05	55.18	51.1	53.72
	Only some confidence	33.15	37.36	34.96	34.27	36.18	35.2
	Hardly any confidence	10.17	11.00	10.99	10.55	12.72	11.08
Private	Great deal of confidence	73.19	74.13	72.50	71.72	73.5	73.02
	Only some confidence	22.62	22.73	23.54	22.9	21.91	22.73
	Hardly any confidence	4.19	3.14	3.96	5.39	4.59	4.25

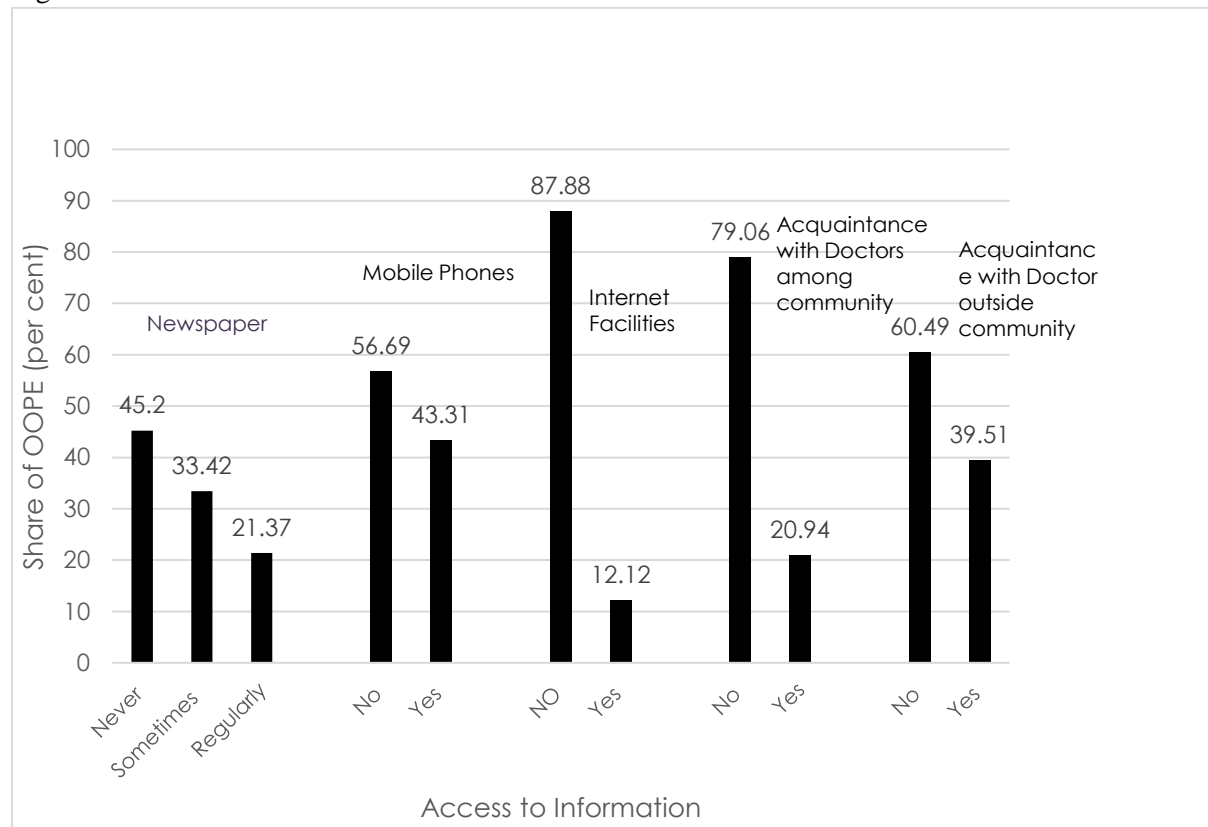
Source: Authors' calculation using India Human Development Survey II

Information Differentials and OOPEHC

In India, the television industry grew from Rs 47,500 crore in 2014-15 to 54,200 crores in 2015-16, indicating a growth of around 14.10 percent. 243 private FM radio stations were operational by March, 2016, besides public service broadcaster. All India Radio (AIR) have a network of 418 stations and 606 broadcast transmitters. India has the world's second largest TV market after China. As on 31st March, 2016, urban telephone subscribers are 609.69 million people whereas rural telephone subscribers are 449.17 million people. In case of internet subscription, urban internet subscriber per 100 population is 58.28 whereas rural internet subscriber per 100 population is 12.80 only. Also, urban teledensity is 154.01 million whereas rural teledensity is 51.37 million in 2015-16 (TRAI report 2017). These data show that urban people have more access to information as compared to rural.

The information index^[v] is composed of five variables - reading newspaper, own mobile, internet access, acquaintance with doctors among caste/community/relatives and acquaintance with doctors outside caste/community/relatives, using Principal Component Analysis (PCA) method. In this index the OOPEHC is relatively high when information is low. As the level of information increases, OOPEHC decreases. Access to information and the impact on OOPEHC is discussed in detail in the figure 1.

Figure 1: Access to Information and OOPE



Source: Authors' Estimation from India Human Development Survey II

We observe that those who never read newspaper have the highest OOPEHC in comparison to those who read newspaper frequently (sometimes or regularly). Newspaper is one of the major sources of information. So, reading newspaper regularly gives access to information which helps in reduction of OOPEHC.

Further, mobile phones, internet facilities and acquaintance with doctors (both among and outside the community) also serves as the major sources of information. The data reveals that those who owns mobile phones have significantly less OOPEHC as compared to those who do not have. Similar case is also observed in the access to internet facilities.

Considering acquaintance with doctors (both among and outside the community), we see that those who have acquaintances with doctors (both among community and outside community) have significantly less OOPEHC compared to those who do not have much known people or doctors in that particular area.

V. Model Specification

The following regression models are specified to draw the inferences given the data (please refer variable description table1 as well as descriptive statistics table 4.

We use log linear regression model based on the dependent and independent variables as described in table 1.

Model 1 (Log Linear OLS using IHDS I)

$$\ln OOPE_{I(2004-05)} = \beta_0 + \beta_1 HHEXP + \beta_2 LOCATION + \beta_3 AGE + \beta_4 EDUCATION + \beta_5 CASTE + \beta_6 GENDER + \beta_7 HUSEDU + \beta_8 CONF + \beta_9 INFO_INDEX + \beta_{10} EAGvsNON-EAG + \varepsilon_i.$$

Model 2 (Log Linear OLS IHDS II)

$$\ln OOPE_{II(2011-12)} = A_0 + A_1 HHEXP + A_2 LOCATION + A_3 AGE + A_4 EDUCATION + A_5 CASTE + A_6 GENDER + A_7 HUSEDU + A_8 CONF + A_9 INFO_INDEX + A_{10} EAGvsNON-EAG + \varepsilon_j$$

Model 3 (Multinomial Logit Regression)

$$P_{ij} = \Pr (M_{ij} > M_{ik}), \text{ for } k \neq j, j=0,1,2.$$

Where P_{ij} is the probability of i th individuals opting for medical institutions (j). They always have two options- either private (1) or government (2). 0 implies neutrality. M_{ij} is preference for medical institution ordered in three categories.

$$GOVvsPVT_{MR} = C_0 + C_1 HHEXP + C_2 LOCATION + C_3 AGE + C_4 EDUCATION + C_5 CASTE + C_6 GENDER + C_7 HUSEDU + C_8 INFO_INDEX + C_9 EAGvsNON-EAG + \varepsilon_k$$

Table 4: Descriptive Statistics of three regression models

	<u>Model 1</u>		<u>Model 2</u>		<u>Model 3</u>	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age (0-14®)						
(15-59) years	0.588	0.492	0.818	0.386	0.818	0.386
>60 years	0.084	0.277	0.055	0.228	0.055	0.228
Gender (Male®)						
Female	0.492	0.499	0.392	0.488	0.392	0.488
Location (Rural®)						
Urban	0.306	0.461	0.413	0.492	0.413	0.492
Caste (Brahmin®)						
OBC	0.407	0.491	0.379	0.485	0.379	0.485
SC	0.210	0.407	0.340	0.474	0.340	0.474
ST	0.069	0.253	0.221	0.415	0.221	0.415
Others	0.256	0.436	0.053	0.223	0.053	0.224
Household exp per capita (very low exp ®)						
Low exp	0.199	0.399	0.182	0.386	0.182	0.386
Medium exp	0.201	0.401	0.202	0.402	0.202	0.402
High exp	0.203	0.403	0.215	0.411	0.215	0.411

Very high exp	0.211	0.408	0.269	0.443	0.269	0.443
Education (Primary®)						
Secondary	0.348	0.476	0.461	0.498	0.461	0.498
Higher Secondary	0.056	0.231	0.127	0.333	0.127	0.333
Graduate	0.051	0.220	0.114	0.318	0.114	0.318
Household head/Husband's education (Primary®)						
Secondary	0.213	0.409	0.165	0.371	0.165	0.371
Higher Secondary	0.015	0.123	0.047	0.211	0.047	0.211
Graduate	0.016	0.126	0.009	0.092	0.009	0.092
Information Index (low level of info®)						
Medium level of info	0.310	0.463	0.328	0.469	0.327	0.469
High level of info	0.324	0.468	0.336	0.472	0.336	0.472
EAGvsNONEAG (NonEAG®)						
EAG	0.428	0.495	0.513	0.499	0.513	0.499
Confidence in Government hospitals (Hardly any confidence®) ~						
Only some confidence	0.279	0.449	0.354	0.478	~	~
Great deal of confidence	0.629	0.482	0.528	0.499	~	~
Confidence in Private hospitals (Hardly any confidence®) # ~						
Only some confidence	-	-	0.195	0.396	~	~
Great deal of confidence	-	-	0.770	0.420	~	~

Source: Authors' estimation using IHDS I and IHDS II

Note: # This variable was not covered in IHDS I.

~ These variables are not considered as control variables in model 3.

These results are derived using a log-linear regression model by using both rounds of IHDS. The dependent variable (OOPEHC) is in logarithmic form. The mean vif (Variance Inflation Factor) value is 1.16 (<10) i.e. there is no presence of multicollinearity.

Table 5: Results of Log Linear OLS Regression Models

	Model 1	Model 2
Log (OOPEHC)	Coef.	Coef.
Age (0-14®)		
(15-59) years	-0.017 (0.011)	0.057 (0.043)
>60 years	0.073*** (0.018)	0.188*** (0.071)
Gender (Male®)		
Female	0.007 (0.009)	0.019 (0.028)
Location (Rural®)		
Urban	-0.283*** (0.011)	-0.445*** (0.030)
Caste (Brahmin®)		
OBC	0.352*** (0.021)	-0.775*** (0.182)
SC	0.273*** (0.023)	-0.777** (0.182)
ST	0.047* (0.027)	-0.789*** (0.182)
Others	0.169*** (0.022)	-1.939*** (0.190)

Household exp per capita (very low exp ®)		
Low exp	0.691*** (0.015)	0.569*** (0.049)
Medium exp	1.119*** (0.016)	0.992*** (0.049)
High exp	1.527*** (0.016)	1.215*** (0.051)
Very high exp	2.171*** (0.018)	1.846*** (0.053)
Education (Primary®) of respondent		
Secondary	-0.075*** (0.011)	-0.338*** (0.034)
Higher Secondary	-0.122*** (0.022)	-0.442*** (0.049)
Graduate	-0.185*** (0.024)	-0.644*** (0.054)
head/Husband's education (Primary®)		
Secondary	-0.033* (0.012)	-0.221*** (0.039)
Higher Secondary	-0.118** (0.038)	-0.282* (0.068)
Graduate	0.009 (0.039)	-1.037*** (0.151)
Information Index (low level of info®)		
Medium level of info	-0.009 (0.012)	0.192*** (0.034)
High level of info	-0.045*** (0.013)	0.200*** (0.038)
EAGvsNONEAG (NonEAG®)		
EAG	-0.016 (0.010)	0.569*** (0.030)
Confidence in Government hospitals (Hardly any confidence®)		
Only some confidence	-0.101*** (0.018)	-0.063 (0.046)
Great deal of confidence	-0.088*** (0.016)	-0.144*** (0.044)
Confidence in Private hospitals (Hardly any confidence ®)		
Only some confidence	-	-0.014 (0.080)
Great deal of confidence	-	0.055 (0.076)
Constant	5.312 (0.030)	5.783 (0.204)
	No. of obs=138136	No. of obs=53919
	F(23,138112)=952.93	F(25,53893)=94.30
	R-squared=0.1370	R-squared=0.0419
	Adj. R-squared=0.1368	Adj. R-squared=0.0415

Source: Authors' estimation using IHDS-I and IHDS-II

Note: Standard errors are in parentheses.

* Significant at 10% . ** Significant at 5% and *** significant at 1% level.

Regression Results and Analysis

The regression models in this paper are well specified by including relevant variables. The interpretation of the slope coefficient of age (third group i.e. above 60 years) is 0.073 for model 1 indicates that if the age of the respondent increases by one year, then OOPEHC increases by

7.3 per cent, given the reference category (age group 0-14 years). It is significant at one per cent level. IHDS II also gives similar result (table 5). Location is another important control variable since it is significant in both the models and justify the existing literature (O'Donnell, 2005). If the resident belongs to urban areas then OOPEHC decreases as compared to those residing in rural areas. This is because in urban areas, private as well as but higher quality health services are more easily accessible compared to the rural areas (Basumatary & Srivastav, 2017).

Education is found to be an important variable significant at one percent level. The regression result in table 5 finds negative relationship between the level of education and OOPEHC (Pandey et al, 2018). It is observed in both the models. Household expenditure per capita has a positive relationship with OOPEHC and statistically significant at one per cent level. Household expenditure per capita is a proxy variable for income. As income increases, people are generally ready to spend more on quality healthcare, thereby expected to incur higher expenditure. Earnings and savings are the main sources of payment for illness (Misra et.al., 2013). The marginalized section of the society who are struggling every single day for their hand to mouth, cannot give much attention to their health issues. A hungry man cannot prioritize anything except food. When income increases, people are inclined towards better health facilities and hence OOPEHC increases. This is justified in both the models (table 5)..

The variable 'confidence in Government hospitals' matters in variation of OOPEHC. The slope coefficient shows that as people are more confident in Government medical institutions, OOPEHC decreases. Also, there is a long waiting time in government hospitals which either increases the transportation cost or patients prefer to visit government doctors practising in private hospitals. Therefore, the OOPEHC is positively linked to confidence in private hospitals (table 5).

Information level as proxied by the 'information index' is negatively linked to OOPEHC in IHDS I and significant for high level of information. In case of IHDS II, it is significant for both medium and high level of information but with a positive sign. The positive sign of the coefficient may be because of the fact that as we have more information, we have more knowledge about the health facilities available and know more about the consequences of various diseases (table 5). Thus, OOPEHC might increase significantly.

The slope coefficient of EAG^[vi] (Empowered Action Group) vs NON-EAG is insignificant in IHDS I but highly significant in model 2 showing that OOPEHC increases in case of EAG

states as compared to non-EAG states. This justifies the fact that EAG states are much more vulnerable as compared to the Non-EAG states and have high OOPEHC.

Quality of Public and Private Medical Institutions in India

This study further identifies the factors which influence the likelihood of accessing public and private healthcare in India. The findings of the above model (model 3) give a close view regarding various factors responsible for accessing government or private medical institutions (table 6). We find that as age increases, people prefer government hospitals rather than private hospitals. Similarly, urban population are more biased towards private medical institutions as compared to government. This is in line with the existing literature (Basumatary & Srivastav, 2017). The variable caste and gender are not significant factors in determining the preference of medical institutions. These two variables are neutral in deciding whether to access public or private hospitals. We also observe that as the income level of family increases, people are more biased towards accessing private medical facilities. This requires less time and so the upward section of the society generally prefer private hospitals. The role of education is also important since it influences the choice for both public and private medical care. The educated persons analyse better to opt for the appropriate health care, may it be private or public. In case of information index as discussed before, we find that people with more level of information access more of private than government healthcare facilities (table 6).

Table 6: Results of Multinomial Logit Regression with reference category

Dependent variable: GOVvsPVT	<u>Private</u>	<u>Government</u>
Constant	-1.037*** (0.135)	-1.111*** (0.179)
Age (0-14®) (15-59) years	-0.032 (0.029)	0.091** (0.044)
>60 years	-0.137*** (0.049)	0.127* (0.071)
Gender (Male®) Female	-0.025 (0.019)	-0.009 (0.028)
Location (Rural®) Urban	0.074*** (0.020)	-0.191*** (0.031)
Caste (Brahmin®) OBC	0.292** (0.130)	0.167 (0.173)
SC	0.331*** (0.130)	-0.084 (0.174)
ST	0.192 (0.130)	0.222 (0.173)

Others	-0.139 (0.136)	-0.188 (0.181)
Household exp per capita (very low exp [®])		
Low exp	-0.015 (0.035)	-0.082* (0.047)
Medium exp	0.052 (0.034)	-0.199*** (0.048)
High exp	0.187*** (0.034)	-0.141*** (0.049)
Very high exp	0.155*** (0.036)	-0.394*** (0.052)
Education (Primary [®])		
Secondary	0.128*** (0.023)	0.108*** (0.033)
Higher Secondary	0.205*** (0.034)	0.094* (0.050)
Graduate	0.189*** (0.037)	0.145*** (0.056)
Household head/Husband's education (Primary [®])		
Secondary	-0.013 (0.026)	-0.175*** (0.041)
Higher Secondary	0.049 (0.045)	-0.394*** (0.818)
Graduate	0.371*** (0.103)	0.362** (0.156)
Information Index (low level of info [®])		
Medium level of info	0.250*** (0.023)	-0.150*** (0.034)
High level of info	0.178*** (0.026)	0.012 (0.037)
EAGvsNONEAG (NonEAG [®])		
EAG	0.390 (0.021)	-0.341*** (0.030)
Log likelihood	-51796.938	
No. of obs = 53946		
LR chi2(42) = 1927		
Prob>chi2 = 0		
Pseudo R2 = 0.0183		

Source: Authors' calculation using India Human Development Survey II

Note: Standard errors are in parentheses.

* Significant at 10%. ** Significant at 5% and *** significant at 1% level.

VI. Conclusion

OOPE on health care is among the serious concerns in India despite many steps undertaken by the Government. The findings in this paper show that age, location, education, caste, household head/husband's education, confidence in government/private hospitals are the significant determinants of OOPEHC in India. Our regression results indicate that age and health expenditure is positively related which is found similar with the existing literature (Kim et al., 2005; Pandey et al 2018). Similarly, variables like location and education also justify the existing literature (O'Donnell et al.,2005; Pandey et al 2018).

The paper also identifies the role of information differentials and confidence in medical institutions which influence OOPEHC significantly. This is important because patients are very vulnerable to the problems of existing corruption in the health care sector (Paul and Bhatia, 2016). This is in concordance with the National Health Policy, 2017 directions towards a significant reduction in OOPEHC specifically on strengthening the trust and confidence of the common man in government hospitals. This is going to be a holistic approach by making it predictable, efficient, patient centric, affordable, effective and inclusive. Better regulation by government will improve confidence and trust among patients along with a decline in OOPEHC. Also, the declining quality and inaccessibility of the government hospitals force people to access private hospitals, even though they are interested in government hospitals (Gwatkin, 2000). Our findings also suggest an inclination towards private hospitals by most of the patients. Nonetheless, information differentials have not been paid attention to by the policy makers in India so far to be considered as an important factor. Moreover, our findings suggest that information differentials influence OOPEHC. Therefore, it is suggested that more specific interventions are required to improve the information differential like wider use of ICT tools in order to lower the OOPE on healthcare in India.

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End Notes:

ⁱ Information requires exposure to mass media. It includes uses of telephone or mobile phones, internet subscriptions and broadcasting sector (television and radio services) etc.

ⁱⁱ Catastrophic health expenditure is defined as out-of-pocket spending for health care that exceeds a certain proportion of a household's income with the consequence that households suffer the burden of disease (*Bulletin of the World Health Organization* 2012;90:664-671. doi: 10.2471/BLT.12.102178)

ⁱⁱⁱ The error term of the model follows logistic distribution as per the kernel density results. The dependent variable is nominal with three categories.

^{iv} However, the role of education is better realized on the quality of education. There are various other aspects of education like cognitive skills, non-technical education etc. are also important for discussion. We consider education in specified categories instead of each nitty gritty.

^v The information index is made through Principal Component Analysis (PCA) method with normalisation. PCA is a mathematical procedure that transforms a number of (possibly) correlated variables into a (smaller) number of uncorrelated variables called principal components.

^{vi} Empowered Action Group (EAG) states are composed of nine high focussed states with relatively high fertility and mortality. These states are considered vulnerable by the Government and require special attention. EAG states include Uttarakhand, Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh and Assam.