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# Determinants of Healthcare Expenditure in Eastern Uttar Pradesh: An Empirical Investigation of In-Patient, Out-Patient and COVID-19 Hospitalization

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**ABSTRACT:** 

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### KEYWORDS

In-patient, Outpatient, Covid hospitalization, Chronic disease, and ICSSR **Introduction**: The NSSO divided Uttar Pradesh into the Northern Upper Gangetic Plains, Central, Eastern, Southern, and Southern Upper Gangetic Plains NSS zones. There are eighteen districts in Eastern Uttar Pradesh. In Eastern Uttar Pradesh, the districts have a sex ratio of 1020 to 867 with a literacy rate ranging from 61% to 40.1%. Additionally, in terms of health, the eastern region of Uttar Pradesh had an average medical expenditure of Rs. 22421.82 in 2018, which is less than the amount in Uttar Pradesh and all of India. Rather, among all the NSS regions in Uttar Pradesh in 2018, the Eastern region had the lowest average monthly per capita expenditure of Rs. 1673.292. According to the author's calculations based on the 75th round of the NSSO, the Eastern area of Uttar Pradesh had the lowest average total health per person of any NSS region in 2018 at Rs. 4065.996. The current study examines relevant determinants that affect health care expenditures in eastern Uttar Pradesh for both in-patient and out-patient as well as Covid hospitalization scenario in an effort to better understand why the U.P. and all of India have such poor health.

**Objective**: The purpose of this research is to look into the determinants that affect healthcare expenditure in the Eastern region of Uttar Pradesh for in-patient care, out-patient care and COVID-19 hospitalization. The results are based on primary survey data from an ICSSR (New Delhi)-sponsored project

**Methods**: The Heckman two-step selection model was employed to examine decisions made by households and individuals to seek medical care.

**Results**: The study's findings show that heads of families between the ages of 31 and 59, as well as those with household incomes between Rs. 5001 and Rs. 25000 and higher, are common factors associated with healthcare expenditure in cases of in-patient, out-patient, and COVID-19 hospitalization. Moreover, private healthcare providers and chronic diseases are also more responsible determinants for higher healthcare expenditure in the study area in the above three cases. Additionally, female gender and OBC category were potential determinants to significantly increase total health care expenditure in case of COVID-19 hospitalization.

**Conclusions**: The responsible determinants influencing health care spending in the study area were private health care providers. In order to control health care, the government should therefore move swiftly to step in and justify its privatization. Stated differently, the current study also recommends that, in order to safeguard the interests of the underprivileged segments of society, particularly in the

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JCHR (2024) 14(3), 1681-1693 | ISSN:2251-6727



study area and throughout India in general, the commercialization and privatization of health facilities and services should be stopped right now.

#### 1. Introduction

During the post-reform era, India experienced substantial economic and agricultural growth, resulting in increased incomes and overall food self-sufficiency. Notwithstanding these advancements, India's health and demographic metrics continue to trail behind, with a low average life expectancy of 67 years, high rates of child and maternal mortality (about 26 per 1,000 lives), high fertility combined with a low age distribution, and rising urbanization (World Bank Group data, 2021). In addition, Economic Survey 2022-23 highlights that, "Rising inequality is threatening India's future by impeding the country's efforts to achieve universal health coverage and increasing morbidity and related mortality. This is because it is very possible that the impoverished and vulnerable will choose not to receive treatment because of the high cost of care". The COVID-19 pandemic has had a disruptive effect on India's economy. The closing of several production routes has caused the economy's growth to slow down. Economic growth continued to deteriorate as a result of reverse labor migration and the ensuing labor shortage (National Paper–PLP–2022-23). The health sector usually receives priority when the government is involved. It is evident how health affects the development of human capital, which implies that health has a significant influence on economic growth (Bloom & Canning, 2000; Jack & Lewis, 2009). It's also clear that people in good health are more productive than those who are ill or in poor health. Healthy people make substantial financial accumulations because of their higher output (Adda, Chandola, & Marmot, 2003). Therefore, more financial resources are required to pay for health-related expenses across all countries. The budgetary allocation for the health sector is heavily influenced by the current socioeconomic state of the country. The two most important socioeconomic factors are educational attainment and national health programs. Additionally, infrastructure for health care and medical personnel are two more important elements. The healthcare delivery system should receive more attention, according to Verma and Usmani (2019), in order to attain higher rates of economic growth. Another

important study found that the crude birth rate, education, urbanization, and foreign aid were all important factors influencing healthcare spending (Imran A. Toor and Muhammad S. Butt, 2005).

Improved health outcomes have resulted from lowermiddle income countries' mainly successful improvements in prenatal care and chronic condition management, including infectious illnesses. But an impoverished nation like India still lacks the means to ensure financial security and universal access for all of its citizens. Due to the dearth of suitable facilities in rural areas, people must still travel long distances to receive specialized or inpatient care for complicated ailments. Growing economies are starting to see an epidemiological shift for non-communicable diseases (NCDs) due to changes in lifestyle and increased affluence, which is expected to complicate the issue (Meenu G Sharma and Harvinder Popli, 2023). Poor health outcomes and the ineffective operation of the Indian health system are the results of all these factors. As recommended by the World Health Assembly (WHO 2005), a country's ability to achieve universal health care depends on its health budget structure. With this background, the present study aims to better understand the determinants influencing household healthcare spending in Eastern Uttar Pradesh (UP), India, with a focus on in-patient, out-patient, and COVID-19 hospitalization. This research is important and fascinating. In cases of in-patient, out-patient, and COVID-19 hospitalization, this will give policy makers and political players additional information to help improve the known determinants. It is significant to highlight that numerous research conducted in various nations have examined the determinants that influence healthcare expenditure (Imran A. Toor and Muhammad S. Butt, 2005, Tin Tin Su et. all, 2006; David Cantarero and Santiago Lago-Penas, 2007; Tauhidur Rahman, 2008; Xu Kea et. all, 2011; Shongkour Roy, 2014; Debasis Barik and Sonal de Desa, 2014; Shailender Kumar Hooda, 2015; Son Hong Nghiem and Luke Brian Connelly, 2017; Verma, C. S. et. all, 2018; Bolaji Samson Aregbeshola & Samina Mohsin Khan; 2020,

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etc.). Based on the results of these studies, households' health expenditure is determined by a number of factors, including income, age distribution, gender, employment, life expectancy, insurance coverage, education, size of the household, chronic disease, and primary health care per population. The state's priority for health, the number of people per doctor, urbanization, crude birth rate, foreign aid, financial capacity, political engagement, and lifestyle. Nonetheless, evidence exists regarding factors influencing health care spending at the Indian household level. For example, a study titled, "Determinants of Public Expenditure on Health in India: Panel Data Estimates". The study made use of datasets from RBIstate finances as well as individual state finance accounts. The main findings were that policy reforms introduced in 2005, fiscal efficiency and political participation of people in a particular state had a significant positive impact on government health expenditure. Demographic characteristics had minimal effect on health spending, according to another study (Shailendra Kumar Hooda, 2015). In continuation of the above, the present study uses primary survey data set collected from selected areas of Varanasi and Gorakhpur and applied Heckman two-stage 'selection model' to obtain the results (as described in Bolaji Samson Aregbesola and Samina Mohsin Khan, 2020). This research adds substantial evidence and valuable insights to the limited body of knowledge regarding the factors influencing health care spending in eastern Uttar Pradesh. An overview of the health system in India, with a focus on Eastern Uttar Pradesh

India, home to over 1.4 billion people, is the largest democracy in the world. A global participant, the nation has become more integrated into the global economy as a result of its strong economic expansion over the past decade (World Bank, 2019). With the third-biggest purchasing power parity economy in the world, the nation hopes to reach upper-middle income status by 2030 (World Bank, 2019). Nonetheless, the prevalence of avoidable diseases is still high in India compared to other nations that saw a similar degree of economic development at the time of independence, and access to quality, accessible, and egalitarian healthcare is still a long way off (K.S. Reddy et.al, 2011). The Indian health system is a complicated combination of governmentcontrolled public hospitals and private hospitals that operate as businesses in a free market, with government funding for employee wages and government-owned facilities and furnishings. The National Family Health Survey-3 indicates that the public health sector provides approximately 30% of health services in urban regions and 37% in rural India; in contrast, the private sector provides roughly 70% of health services in urban areas and 63% in rural India. Primary, secondary, and tertiary healthcare delivery systems are the three that exist in India. The goal of these systems' collaboration is to deliver healthcare in an efficient manner. However, because these three play duplicate responsibilities, there hasn't been enough coordination. Considered the cornerstone of the nation's health system, the primary health system has miserably failed to provide the Indian people with basic health services and infrastructure due to a number of issues, including insufficient funding, subpar performance from healthcare providers, poor service delivery, poor administration, and inadequate infrastructure (Health Care in India: Current Status and Major Essentials-Review of the National Health Policy, 2015). India's health indices are poor when compared to the average for South Asia based on the same characteristics. India has a 69-year life expectancy, 41.9 deaths per 1000 live births for children under five, 113 deaths per 100,000 live births for mothers, and 24.9 deaths per 1000 live births for neonatal (NHFS-5). In India, total health spending amounts to just 1.6% of GDP, with public health spending making up only 27.13% of the total and private health spending accounting for 72.06%. These figures are based on health financing and expenditure indices (World Bank, 2019). We already know that Uttar Pradesh is among the poorest states in India in addition to the previously stated statistics. Not only does 37.79% of the population live in multidimensional poverty (NITI Aayog 2021), but the country also performs poorly on health indices, with high rates of infant and maternal mortality (50.4 per 1,000 live births and 197 per 1,00,000 live births, respectively) (NHFS-5). It is imperative that Uttar Pradesh's health care system be rebuilt to offer better financial protection against medical expenses and that financial barriers to accessing care be eliminated. However, data from the 75th round of the NSSO (July 2017 to June 2018) showed that, in Uttar Pradesh, the average total medical expense per hospitalization case is Rs. 26089, compared to Rs. 20135 in India. According to NSSO 2018, the average total medical expenditure per hospitalization case in

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Uttar Pradesh's rural and urban areas are Rs. 23144 and Rs. 33339, respectively, whereas nationwide, they are Rs. 16676 and Rs. 26475. Uttar Pradesh has been split into five NSS regions by the NSSO: the Northern Upper Gangetic Plains, Central, Eastern, Southern, and Southern Upper Gangetic Plains. The Eastern Uttar Pradesh region consists of eighteen districts. The sex ratio in the districts of Eastern Uttar Pradesh is between 1020 and 867 while the literacy ranges from 61% to 40.1%. Furthermore, on health aspects, the average medical expenditure in the eastern region of Uttar Pradesh is Rs. 22421.82 which is less than UP and All India level in 2018. Instead, the average monthly per capita expenditure is as low as Rs. 1673.292 in Eastern region among all NSS regions of Uttar Pradesh in 2018. Similarly, the average total health per person is also the lowest at Rs. 4065.996 in Eastern region among all NSS regions of Uttar Pradesh in 2018 (Author's calculation from NSSO's 75th round). In order to better understand why the U.P. and all of India have such poor health, the current study looks into pertinent determinants that affect health care costs in eastern Uttar Pradesh for both inpatient and out-patient as well as Covid hospitalization scenarios.

### 2. Objective

Examining the determinants that influence healthcare expenditure for in-patient, out-patient care, and COVID-19 hospitalization in the Eastern part of Uttar Pradesh is the aim of this study.

### 3. Methods

For the purpose of the study, field survey data of ICSSR sponsored project has been taken as paper titled is one of the objectives and to obtain the results. However, for the entire representation of eastern Uttar Pradesh, Gorakhpur district from the north-eastern corner and Varanasi district from the south-eastern corner of the state have been selected in the present study. Stratified sampling has also been used to select these two districts in the study. Four thousand samples were gathered in all, two thousand from each of the districts of Varanasi and Gorakhpur. The size of the sample has been decided by the following formula: Sample Size (SS); ss =  $\frac{z^2 * (p)*(1-p)}{c^2}$ 

Where; Z = Z value (90% confidence level), p=27.5, c = confidence interval (±1)

Moreover, the "Heckman 'two-step' selection model" was used in this study to address the problem of selection bias among those who did not report paying for healthcare. Heckman's two-step selection approach examines possible bias in sample selection. Using the regression equation (i) and selection equation (ii) the model equation:

 $yj = xj\beta + u1j$  .....(i)

Spending on healthcare was not always adhered to. Instead, healthcare spending was noted for households that became ill and needed medical attention if:

zjγ+u2j>0 .....(ii)

Where,

\* corr.  $(u1, u2) = \rho$ 

The first equation produces biased findings when standard regression techniques are applied when  $\rho$  is not equal to zero. Nonetheless, in these situations, the Heckman model offers reliable, asymptotically efficient estimates for each and every parameter. In addition, we used the "Hosmer-Lemeshow" test to determine the model's goodness of fit and looked for multicollinearity. Further, fourteen versions of Stata software have been used in the study. In the study, only 10 variables relevant to the study purpose have been selected. Indeed, the present study took three dependent variables step-by-step such as total health expenditure of in-patient hospitalization, total health expenditure of Covid-hospitalization.

Grossman's theory of the demand for health, Andersen's behavioral model, and an overview of the literature on the variables affecting healthcare spending (Imran A. Toor and Muhammad S. Butt, 2005, Tin Tin Su et. all, 2006; David Cantarero and Santiago Lago-Penas, 2007; Tauhidur Rahman, 2008; Xu Kea et. all, 2011; Shongkour Roy, 2014; Debasis Barik and Sonal de Desa, 2014; Shailender Kumar Hooda, 2015; Son Hong Nghiem and Luke Brian Connelly, 2017; Verma, C. S. et. all, 2018; Bolaji Samson Aregbeshola &Samina Mohsin Khan; 2020, etc.) were used as a guide for the independent or explanatory variables. Age, income level,

www.jchr.org

JCHR (2024) 14(3), 1681-1693 | ISSN:2251-6727



and education are only a few of the variables that impact the demand for health and medical treatment, according to Grossman (1972). He suggested that health demand may be thought of in his model as a long-term capital stock that generates an output of healthy times. The model explains the differences in health care amongst people by utilizing supply and demand curves for health capital. According to Grossman's model, the amount of health capital required over the course of a person's life will eventually drop if the rate of depreciation rises with age. With the use of the demand for health model, one may examine the effects of demographic factors like age, income, and education without assuming that they are associated in any way with consumers' "tastes" for health (Grossman 1972). The factors that influence a person's decision to seek medical care are categorized by the Anderson Behavioral Model as predisposing factors (such as age, sex, ethnicity, and characteristics of the household head); enabling factors (such as location, geopolitical zone, education, health insurance status, and household income); and need factors (such as perceived severity of illness, self-reported health status, presence of physician diagnosing chronic diseases, and overweight).

An individual's decision to seek medical care is based on how these variables interact. Three age groups were identified for the head of household in the current study i.e. 20 to 30 years, 31 to 59 years and 60 and above. Instead of classifying religion into two groups-Hindu and Muslim-the survey questionnaire defined social groupings, which were further separated into four categories: General, SC, ST, and OBC. In addition, household income was classified into three groups. 2000-5000, Rs. 5001 to 25000 rupees and 25001 and above. However, gender was divided into two categories male and female, and family type was also classified into two categories as joint and nuclear. Marital status was defined as married and unmarried and household education was classified into four groups below primary, primary, upper primary and secondary + according to the survey questionnaire. Chronic diseases were divided into two groups 'no' and 'yes'. Public hospitals and private hospitals were the two categories used to designate medical facilities for the study's purposes, based on the survey questionnaire.

#### 4. Results

Table-1: Determinants of total health expenditure (in-patient hospitalization) by regression and two-step Hackman selection model

| Variables                                      |            | Regression       |                |           | Heckman Selection |         |  |
|--|------------|------------------|----------------|-----------|-------------------|---------|--|
| Total health                                   | Coef.      | (Std. error)     | P-value        | Coef.     | (Std. error)      | P-value |  |
| expenditure<br>(in-patient<br>hospitalization) |            |                  |                |           |                   |         |  |
| Head of household age                          | _          |                  |                |           |                   |         |  |
| 20 to 30 years®                                |            |                  |                |           |                   |         |  |
| 31 to 59 years                                 | 0.17       | (0.13)           | 0.19           | 0.57      | (0.14)            | 0.00    |  |
| 60 and above                                   | 0.03       | (0.19)           | 0.88           | 0.41      | (0.23)            | 0.07    |  |
| Religion                                       |            |                  |                |           |                   |         |  |
| Hindu®   |            |                  |                |           |                   |         |  |
| Muslims  | 0.00       | (0.22)           | 0.01           | 0.84      | (0.36)            | 0.02    |  |
| Social Group                                   |            |                  |                |           |                   |         |  |
| General®                                       |            |                  |                |           |                   |         |  |
| SC   | -0.02      | (0.16)           | 0.87           | -0.18     | (0.19)            | 0.34    |  |
| ST   | 0.06       | (0.15)           | 0.67           | -0.67     | (0.39)            | 0.08    |  |
| OBC  | 0.11       | (0.32)           | 0.72           | -0.30     | (0.17)            | 0.09    |  |
| Household income                               |            |                  |                |           |                   |         |  |
| Rs. 2000-5000®                                 |            |                  |                |           |                   |         |  |
| Rs. 5001 to Rs.25000                           | 0.22       | (0.12)           | 0.06           | -0.05     | (0.14)            | 0.72    |  |
| Rs.25001 and above                             | 0.25       | (0.17)           | 0.15           | 0.26      | (0.22)            | 0.23    |  |
| Gender   |            |                  |                |           |                   |         |  |
| Male®  |            |                  |                |           |                   |         |  |
| Female   | 0.03       | (0.10)           | 0.76           | -0.22     | (0.13)            | 0.08    |  |
| Family type                                    |            |                  |                |           |                   |         |  |
| Joint®   |            |                  |                |           |                   |         |  |
| Nuclear  | 0.01       | (0.15)           | 0.90           | -0.19     | (0.21)            | 0.35    |  |
| Marital Status                                 |            |                  |                |           |                   |         |  |
| Married®                                       |            |                  |                |           |                   |         |  |
| Unmarried                                      | 0.12       | (0.22)           | 0.57           | -0.20     | (0.26)            | 0.42    |  |
| Household Education                            |            |                  |                |           |                   |         |  |
| No Schooling®                                  |            |                  |                |           |                   |         |  |
| Below primary                                  | -0.52      | (0.30)           | 0.08           | -0.76     | (0.30)            | 0.01    |  |
| Primary  | 0.38       | (0.42)           | 0.37           | 6.18      | (0.45)            | 0.02    |  |
| Upper Primary                                  | -0.01      | (0.15)           | 0.93           | 0.27      | (0.20)            | 0.18    |  |
| Secondary+                                     | -0.10      | (0.12)           | 0.41           | -0.11     | (0.16)            | 0.46    |  |
| Chronic Ailment                                | •          |                  |                |           |                   |         |  |
| No®  |            |                  |                |           |                   |         |  |
| Yes  | 0.44       | (0.67)           | 0.62           | 0.01      | (0.79)            | 0.99    |  |
| Healthcare provider                            |            |                  |                |           |                   |         |  |
| Govt./Public®                                  |            |                  |                |           |                   |         |  |
| Private  | 0.19       | (0.11)           | 0.09           | 0.16      | (0.14)            | 0.27    |  |
| Number of selected<br>observations             |            | 982              |                |           | 982               |         |  |
| Note- *significant at p<                       | 0.1, -**si | gnificant at p<0 | ).05, -***sign | ificant a | t p<0.01,         |         |  |

©Reference category Source: Author's calculation of the field survey data

The above table shows the determinants of total health expenditure (in-patient hospitalization) by regression and the two-step Heckman selection model. In the regression model, ages between 31 to 59 years (0.17, p=0.19) and 60 years and above (0.03, p=0.88) head of the households, in social group; ST (0.06, p=0.67) and OBC (0.11, p=0.72), household income Rs.25001 and above (0.25, p=0.15), female gender (0.03, p=0.76), nuclear family (0.01, p=0.90), unmarried (0.12, p=0.57), primary education (0.38, p=0.37) and chronic ailment (0.44, p=0.62) were likely to incur health care expenses compare with their reference categories, but the relation was not significant. However, the Muslim religion of a patient (0.00, p=0.01), the household income of. Rs. 5001 to Rs.25000 (0.22, p=0.06) and private healthcare providers (0.19, p=0.09) were having more expenditure on healthcare than their counterparts. And the relations

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were significant. While, in the social group; SC has had (-0.02, p=0.87) and in the household education; below primary (-0.52, p=0.08), upper primary (-0.01, p=0.93), and Secondary+ (-0.10, p=0.41) schooling of household head were less likely to incur expenditure on total healthcare (in-patient hospitalization) as compared their reference categories in the study area.

In the selection model, having a household head age between 31 to 59 years (0.57, p=0.00) was a potential determinant of total health expenditure (in-patient hospitalization) in the study area. And 60 and above years (0.41, p=0.07), Muslim religion patients (0.84, p=0.02), and heads of household having primary education (6.18, p=0.02) were more likely to incur expenditure on total health (in-patient hospitalization) compared to their reference categories. And these were significant. Further, a household's income of Rs.25001 and above (0.26, p=0.23) and heads of household's having upper primary education (0.27, p=0.18) were also more likely to incur total healthcare expenditure (inpatient hospitalization) compared to their reference categories but the relation was not significant for the study area. The female household heads (-0.22, p=0.08), unmarried households (-0.20, p=0.42), and household's income of Rs. 5001 to Rs.25000(-0.05, p=0.72) were less likely to incur expenditure on healthcare (in-patient hospitalization) as compared to their reference categories in the study area. Instead, in the social group, SC (-0.18, p=0.34), ST (-0.67, p=0.08), and OBC (-0.30, p=0.09) were less likely to incur total healthcare expenditure (inpatient hospitalization) as compared to the reference category. Moreover, in the household education, below primary (-0.76, p=0.01) and Secondary+(-0.11, p=0.46) were also less likely to incur total healthcare expenditure (in-patient hospitalization) as compared to the reference category. At the last, chronic ailment (0.01, p=0.99) and private healthcare providers (0.16, p=0.27) were also more likely to incur total healthcare expenditure (inpatient hospitalization) as compared to their reference categories but relations were insignificant for the study area.

| Variable                        |       | Regressio    | on      |       | Heckman Sele | ection  |
|---------------------------------|-------|--------------|---------|-------|--------------|---------|
| Total health                    | Coef. | (Std. error) | P-value | Coef. | (Std. error) | P-value |
| expenditure                     |       |              |         |       | ł            | -       |
| (out-patient visits)            |       |              |         |       |              |         |
| Head of household age           |       |              |         |       |              |         |
| 20 to 30 years®                 | 0.00  | (0.02)       | 0.00    | 0.42  | (022)        | 0.05    |
| 31 to 59 years                  | 0.00  | (0.03)       | 0.90    | 0.42  | (022)        | 0.05    |
| 60 and above                    | 0.02  | (0.05)       | 0.69    | 0.20  | (0.34)       | 0.55    |
| Religion                        |       |              |         |       |              |         |
| Hindu®                          |       |              |         |       |              |         |
| Muslims                         | 0.00  | (0.07)       | 0.94    | -0.09 | (0.46)       | 0.83    |
| Social Group                    |       |              |         |       |              |         |
| General®                        |       |              |         |       |              |         |
| SC                              | -0.04 | (0.04)       | 0.00    | 0.11  | (0.32)       | 0.72    |
| ST                              | -0.02 | (0.14)       | 0.86    | -0.76 | (0.51)       | 0.13    |
| OBC                             | -0.20 | (0.04)       | 0.00    | -0.10 | (0.35)       | 0.64    |
| Household income                |       |              |         |       |              |         |
| Rs. 2000-5000®                  |       |              |         |       |              |         |
| Rs. 5001 to Rs.25000            | 0.14  | (0.03)       | 0.00    | 0.27  | (0.26)       | 0.29    |
| Rs.25001 and above              | 0.19  | (0.05)       | 0.00    | 0.01  | (0.39)       | 0.96    |
| Gender                          |       |              |         |       |              |         |
| Male®                           |       |              |         |       |              |         |
| Female                          | 0.03  | (0.03)       | 0.20    | 0.38  | (0.22)       | 0.09    |
| Family type                     |       |              |         |       |              |         |
| Joint®                          |       |              |         |       |              |         |
| Nuclear                         | 0.16  | (0.04)       | 0.45    | 0.12  | (0.33)       | 0.71    |
| Marital Status                  |       |              |         |       |              |         |
| Married®                        |       |              |         |       |              |         |
| Unmarried                       | -0.12 | (0.6)        | 0.04    | -0.16 | (-0.71)      | 0.47    |
| Household Education             |       |              |         |       |              |         |
| No Schooling®                   |       |              |         |       |              |         |
| Below primary                   | 0.01  | (0.07)       | 0.14    | 0.05  | (0.21)       | 0.83    |
| Primary                         | 0.22  | (0.20)       | 0.20    | 0.13  | (0.19)       | 0.85    |
| Upper Primary                   | 0.03  | (0.40)       | 0.88    | 0.00  | (0.02)       | 0.98    |
| Secondary+                      | 0.10  | (0.03)       | 0.00    | 0.09  | (0.70)       | 0.48    |
| Chronic Ailment                 |       |              |         |       |              |         |
| No®                             |       |              |         | _     |              |         |
| Yes                             | 0.87  | (0.10)       | 0.42    | 0.07  | (0.19)       | 0.84    |
| Healthcare provider             |       |              |         |       |              |         |
| Govt./Public®                   |       |              |         |       |              |         |
| Private                         | 0.58  | (0.35)       | 0.09    | 0.10  | (0.21)       | 0.61    |
| Number of selected observations |       | 3922         |         |       | 3922         |         |

**Source:** Author's calculation of the field survey data

source: Author's culculation of the field survey data

The determinants of total health expenditure (out-patient hospitalization) by regression and the two-step Hackman selection model are presented in Table-2. In the regression model of out-patient visits, a household income of Rs. 5001 to Rs.25000(0.14, p=0.00) and Rs.25001 and above (0.19, p=0.00) and a household's education of Secondary<sup>+</sup>(0.10, p=0.00) are potential determinants and were more likely to incur healthcare spending for out-patient visits compared with their reference categories. And the relationship was significant for the study area. Whereas, private healthcare providers (0.58, p=0.09) have more expenditure on healthcare than the reference category and the relation was also significant for the study area. While, having a household head age between 31 to 59 years (0.00, p=0.90) and 60 and above years (0.02, p=0.69), Muslim religion patients (0.00, p=0.94), nuclear family, and the heads of household education especially; below primary (0.01, p=0.14), primary (0.22, p=0.20) and upper primary (0.03,

www.jchr.org

### JCHR (2024) 14(3), 1681-1693 | ISSN:2251-6727



p=0.88) and chronic ailment (0.87, p=0.42) were likely to incur expenditure on total healthcare for out-patient visits as a compared their reference categories but the relations were insignificant for the study area. Albeit, in the social group; SC (-0.04, p=0.00), OBC (-0.20, p=0.00), and unmarried (-0.12, p=0.04) have had less likely to incur expenditure on total healthcare (outpatient visits) than their reference categories and the relations were significant. Though the ST category (-0.02, p=0.86) was also less likely to incur expenditure on total healthcare (out-patient visits) than the reference category and the relation was insignificant for the study area.

In the selection model of out-patient visits, having a household head age of 31 to 59 years (0.42, p=0.05) and female gender (0.38, p=0.09) were more likely to incur expenditure on total healthcare (out-patient visits) compared to their reference categories and the relations were significant. While 60 and above years (0.41, p=0.07), SC category (0.11, p=0.72), a household's income of Rs. 5001 to Rs.25000 (0.27, p=0.29) and Rs.25001 and above (0.01, p=0.96), nuclear family (0.12, p=0.71), in the heads of household's education; below primary (0.05, p=0.83), primary (0.13, p=0.85), upper primary (0.00, p=0.98) and secondary<sup>+</sup>(0.09, p=0.48), chronic ailment (0.07, p=0.84) and private healthcare providers (0.10, p=0.61) were also likely to incur expenditure on total healthcare for out-patient visits compared to their reference categories but the relations were insignificant. Furthermore, in the social group; ST (-0.76, p=0.13) and OBC (-0.10, p=0.64), Muslim religion of patients (-0.09, p=0.83) and unmarried (-0.16, p=0.47) were less likely to incur total healthcare expenditure (out-patient visits) as compared to their reference categories for the study area. And the relations were also insignificant with their counterparts.

| Variable   |       | Regressio    | n       | Heckman          | Selection  |
|--|-------|--------------|---------|------------------|------------|
| Total health                                     | Coef. | (Std. error) | P-value | Coef. (Std. erro | r) P-value |
| expenditure                                      |       |              |         |                  |            |
| (Covid-nospitalization)<br>Head of household age |       |              |         |                  |            |
| 20 to 30 years®                                  |       |              |         |                  |            |
| 31 to 59 years                                   | 0.26  | (0.21)       | 0.21    | 0.13 (0.19)      | 0.48       |
|  | 0.00  | (0.25)       | 0.54    | 0.55 (0.00)      | 0.01       |
| 60 and above                                     | 0.22  | (0.37)       | 0.54    | 0.77 (0.32)      | 0.01       |
| Religion   |       |              |         |                  |            |
| Hindu®   | 0.41  | (0.25)       | 0.05    | 0.52 (0.20)      | 0.17       |
| Muslims  | 0.41  | (0.35)       | 0.25    | 0.53 (0.38)      | 0.17       |
| Social Group                                     |       |              |         |                  |            |
| General®   | 0.20  | (0.20)       | 0.00    | 1.(1.(0.05)      | 0.00       |
| SU.  | -0.39 | (0.30)       | 0.20    | -1.01 (0.25)     | 0.00       |
| 51<br>OPC  | 0.39  | (0.29)       | 0.18    | -1.18 (0.23)     | 0.00       |
| UBC  | 0.90  | (0.24)       | 0.00    | 0.01 (0.20)      | 0.97       |
| Household income                                 |       |              |         |                  |            |
| Rs. 2000-5000®                                   | 0.01  | (0.00)       | 0.00    | 0.10 (0.20)      | 0.25       |
| Rs. 5001 to Rs.25000                             | -0.01 | (0.28)       | 0.98    | 0.19 (0.20)      | 0.35       |
| Rs.25001 and above                               | 0.99  | (0.33)       | 0.00    | 0.51 (0.32)      | 0.11       |
| Gender   |       |              |         |                  |            |
| Male®  | 0.10  | (0.10)       | 0.22    | 0.01 (0.16)      | 0.00       |
| Female   | 0.19  | (0.19)       | 0.33    | 0.01 (0.16)      | 0.00       |
| Family type                                      |       |              |         |                  |            |
| Joint®   | 0.01  | (0, 10)      | 0.00    | 0.07 (0.20)      | 0.20       |
| Nuclear  | 0.81  | (0.48)       | 0.09    | 0.27 (0.30)      | 0.38       |
| Marital Status                                   |       |              |         |                  |            |
| Mamed®   | 1.05  | (0.22)       | 0.00    | 0.25 (0.45)      | 0.42       |
|  | -1.05 | (0.55)       | 0.00    | 0.35 (0.45)      | 0.45       |
| No Schooling®                                    |       |              |         |                  |            |
| No Schooling®                                    | 0.00  | (0.00)       | 0.02    | 0.45 (0.54)      | 0.40       |
| Delow primary                                    | -0.09 | (0.99)       | 0.92    | -0.45 (0.54)     | 0.40       |
| Pinnary  | 0.54  | (0.38)       | 0.00    | 0.15 (0.29)      | 0.05       |
| Opper Primary                                    | 0.51  | (0.12)       | 0.09    | -0.08 (0.23)     | 0.73       |
| Chronic Ailmont                                  | 0.58  | (0.15)       | 0.01    | -0.13 (0.08)     | 0.09       |
| No®  |       |              |         |                  |            |
| Vac  | 0.60  | (0.46)       | 0.64    | 0.09 (0.90)      | 0.02       |
| Loolthoore merida-                               | 0.00  | (0.40)       | 0.04    | 0.00 (0.09)      | 0.92       |
| Covt /Dublio®                                    |       |              |         |                  |            |
| Dovi./Public®                                    | 0.05  | (0.20)       | 0.77    | 0.24 (0.16)      | 0.15       |
| riivate  | 0.05  | (0.20)       | 0.77    | 1496             | 0.15       |
| inumber of selected                              | 1     | 1480         |         | 1480             |            |

Table-3: Determinants of total health expenditure (Covid-hospitalization) by regression

Source: Author's calculation of the field survey data

**Table-3** revealed the determinants of total health expenditure in the case of Covid-hospitalization by regression and the two-step Hackman selection model. *In the regression model of Covid-hospitalization*, OBC category (0.90, p=0.00), a household's income of Rs.25001 and above (0.99, p=0.00) and a household's education of Secondary+(0.38, p=0.01) are potential determinants and were more likely to incur healthcare spending (Covid-hospitalization) compared with their reference categories. And the relationships were significant for the study area. Though nuclear family (0.81, p=0.09) and upper primary (0.51, p=0.09) were

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JCHR (2024) 14(3), 1681-1693 | ISSN:2251-6727



also likely to incur the same and the relation was also significant for the study area. However, having a household head age between 31 to 59 years (0.26, p=0.21) and 60 and above years (0.22, p=0.54), Muslim religion patients (0.41, p=0.25), ST category (0.39, p=0.18), female gender (0.19, p=0.33), the heads of household education especially; primary (0.34, p=0.37), chronic ailment (0.60, p=0.64), and private healthcare providers (0.05, p=0.77) were likely to incur expenditure on total healthcare (Covid-hospitalization) as a compared their reference categories but the relations were insignificant for the study area. Although, unmarried (-1.05, p=0.00) were less likely to incur expenditure on the same than the reference category, the relations were significant for the study area. However, SC category (-0.39, p=0.20), the household's income of Rs. 5001 to Rs.25000 (-0.01, p=0.98) and below primary education of the head of the household (-0.09, p=0.92) were also less likely to incur expenditure on total healthcare (Covid-hospitalization) than their reference categories and the relations were insignificant for the study area.

In the selection model of Covid-hospitalization, having a household head age of 60 years and above (0.77, p=0.01) followed by female gender (0.01, p=0.00) were potential determinants and more likely to incur expenditure on total healthcare in the case of Covidhospitalization compared to their reference categories and the relations were significant for the study area. While having a household head age of 31 to 59 years (0.13, p=0.48), Muslim religion (0.53, p=0.17), OBC category (0.01, p=0.97), household's income of Rs. 5001 to Rs.25000 (0.19, p=0.35) and Rs.25001 and above (0.51, p=0.11), nuclear family (0.27, p=0.38), unmarried (0.35, p=0.43), primary education of head of the household (0.13, p=0.65), chronic ailment (0.08, p=0.92) and private healthcare providers (0.24, p=0.15) were also likely to incur expenditure on total healthcare (Covidhospitalization) compared to their reference categories but the relations were insignificant. Further, in the social group; SC (-1.61, p=0.00) and ST (-1.18, p=0.00), and Secondary<sup>+</sup>(-0.13, p=0.09) were less likely to incur the same as compared to their reference categories but the relations were significant for the study area. Meanwhile, heads of the household education mainly below the primary (-0.13, p=0.09) and upper primary (-0.08, p=0.73) were also less likely to incur the same as

compared to the reference category but the relations were insignificant for the study area.

#### 5. Discussion

#### In-patient Hospitalization

The findings of the present chapter showed that household and personal characteristics play a significant role in the variation in the likelihood of health care spending. In terms of total expenditure, specifically inpatient hospitalization, for heads of households between 31 and 59 years and 60 years and over were likely to incur healthcare expenditure in the study area/eastern region. This may be a result of more awareness programs recently launched by the government and an older population, which may contribute to rising health care costs. The Households belonging to a religion other than Hindu i.e. Muslim, and the household income of. Rs. 5001 to Rs.25000 were having more expenditure on healthcare than their counterparts were found to be expenditure considerably more on healthcare than their counterparts. Findings showed that families belonging to poorer socioeconomic status (Muslim religion and low-income families) were consistently facing worse health outcomes. This may be due to the inability to access health facilities or the inability to pay for the use of health services. And private healthcare providers also incurred more healthcare expenditure in the study area. For this, it is noted that public hospitals face many challenges like lack of skilled staff, improper or inadequate infrastructure, unbearable patient load and poor or average quality of services, hence the public is looking for private hospitals for treatment. It is also noted that people who use the services of private hospitals suspect that several private health care providers carry out needless investigative tests and clinical procedures. However, despite this skepticism, people are still opting the private sector in enormous numbers because the public alternative is very poor as one has to wait limitlessly in unclean environments with crowds of other patients. A lot of medicines and tests are also not existing in the public sector, so patients have to go to private medical stores and test center to avail health facilities and examinations. For these reasons, private hospitals in the region were found to be more probable to spend on health care. Further, in the social group mainly ST and OBC had

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JCHR (2024) 14(3), 1681-1693 | ISSN:2251-6727



also more expenditure on the same (in-patient hospitalization). This is because of the increasing awareness among them or the minimal access to health care or lack of technological intervention or they are often not in a situation to pay for the use of health services.

Moreover, household income of Rs.25001 and above also had more expenditure in the case of in-patient hospitalization. Because they have the resources to bear it. Further, a nuclear family also spent more on healthcare as compared to a joint family in the study area. This is because living in a single-parent household, although becoming more common in the study area, can be quite stressful for adults and children. Single parents can feel overwhelmed with responsibilities, so patients tend to spend more on health care. In addition, chronic ailments were likely to incur healthcare spending (in-patient cases) compare with counterparts. A more appropriate explanation is that this is due to the higher cost of managing chronic diseases compared to non-chronic diseases in the study area. As per the findings, female household heads were less likely to incur expenditure on health care as compared to their male counterparts. This can be attributed to the increasing capacity of female dominated households to take proper health precautions and the increasing rate of female literacy and health awareness in recent years. However, the study revealed that SC and schooling of the household head like below primary, upper primary, and Secondary+ were less likely to incur expenditure on total healthcare (in-patient hospitalization) as compared their reference categories in the study area. One possible explanation is that scheduled castes are the most marginalized and among poorer income groups, as one becomes more educated, more knowledgeable and more aware of better health care options and selects the optimum health services in the study area.

#### **Out-patient visits**

In case of the out-patient visits by the patient/household, a household income of Rs. 5001 to Rs.25000 and Rs.25001 and above and a household's education of Secondary+ are potential determinants and were more likely to incur healthcare spending significantly. It is because everyone understands that health is wealth, so whatever a household has the level of income, they have

been spending a major proportion of income on healthcare and for it, education plays a background role in stimulating health spending at length. And private healthcare providers have also incurred expenditure significantly on healthcare than government healthcare providers. A possible explanation is that private hospitals operate with a profit motive and therefore have to cover their costs from their revenues while earning some profit to keep the hospital running. Therefore, in the study area, the drug charges on MRP, investigation and diagnosis charges, maximum and etc. Further, having a household head age of 31 to 59 years, 60 years and above and female gender were more likely to incur expenditure significantly on total healthcare (out-patient visits) compared to their reference categories. As mentioned earlier, the reason observed by the field survey is that it may be a result of greater awareness among households due to several recent programs run by the government and the older population, which contributes to rising health care costs in the study. While the ST category was less likely to incur total healthcare expenditure (outpatient visits) as compared to the reference category for the study area. One possible reason as seen from the region is that ST class is still dependent on indigenous type of medicines and treatment.

#### **Covid-Hospitalization**

Concerning Covid-hospitalization, OBC category, a household's income of Rs.25001 and above and a household's education of Secondary+ are potential determinants and upper primary and the nuclear family were also more likely to incur healthcare spending significantly in the case of Covid- hospitalization compared with their reference categories. For this, an appropriate explanation is that there is awareness among the OBC class, the higher-income group has control over the resources, and an educated person is always updated with information and looks at the COVID-spread and its repercussions. Also, nuclear families have been the most affected during the pandemic, so the COVID-hospitalization cost was high, possibly due to lack of a better support system.

Moreover, having a household head age of 60 years and above followed by female gender were potential determinants and more likely to incur expenditure significantly on total healthcare (Covid-hospitalization) www.jchr.org

JCHR (2024) 14(3), 1681-1693 | ISSN:2251-6727



compared to their reference categories. The valid reason is that COVID first affected the elderly due to weakened immune systems as it reduced quality of life and increased depression. In addition, during the pandemic, emerging norms of work from home and online education due to lockdown, and new hygiene requirements are to blame for the increased burden. For housewives/housewives, the excessive burden is due to the perception that the share of responsibility for unpaid work should be higher due to non-engagement, therefore, the female gender was at risk during the pandemic, especially during the lock-down time in the study area.

Instead, private healthcare providers were also likely to incur expenditure on total healthcare (Covidhospitalization) compared to the reference category. One possible reason observed during the survey was that inadequate beds in government hospitals and absence of specific guidelines for COVID-19 treatment resulted in private hospitals charging exorbitantly in the name of services. Although unmarried were less likely to incur expenditure significantly on the same than the married for the study area. There is no fear at all as singles have no responsibility towards the family, so in the study area they were less likely to be affected by covid. Furthermore, in the social group; SC and ST were less likely to incur significantly the same as compared to their reference categories in the study area. For this, as revealed from the study area that most of the SCs and STs belong to marginalized sections and have low-income levels, efforts are being made to treat them with the AYUSH Raspy circulated during COVID by the Ministry of AYUSH.

### 6. Conclusion and Policy Suggestions

From the analysis and discussion of the study, it is obvious that household and individual characteristics play an important role in variation and likelihood of health care expenditure. The common determinants for health expenditure in terms of inpatient, outpatient and COVID hospitalization cases have been noted as household heads between 31 and 59 years, income of households Rs 5001 to Rs 25000 and Rs 25001 and above. Moreover, private healthcare providers and chronic diseases also led to higher healthcare expenditure in the study area in the mentioned cases. Additionally, female gender and OBC category were potential determinants to significantly increase total health care expenditure in case of COVID-19 hospitalization.

In light of the aforementioned, private health service providers were the responsible determinant influencing health care spending in the study area. Accordingly, the government should act quickly to intervene and rationalize the privatization of health care in order to control it. In other words, the present study also suggests that commercialization/privatization of health facilities and services should be stopped immediately to protect the interests of the marginalized section of the society in the study area in particular and U.P. and at all India level in general.

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