Household Catastrophic Health Expenditure And Its Determinants In Pakistan

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Abstract

This paper looks at how much money Pakistani families spend on health issues. Using data from PSLM for the years 2018–19. It investigates the components and variables that influence how much money families spend on different health diseases. The estimation results show that the cost of a family's catastrophic expenditure varies depending on a number of factors, including the nature of diseases, people living in different provinces, the location[1] either urban or rural, employment status of the households, marital status and type of service provider for curing the disease. Health expenditure is also affected by an increase in income and in the number of family size. Such factors drives an increase or decrease in household health spending. However, policy recommendations for health expenditure are influenced positively by ends in light of all factors. In addition, any revelation may infer a wide range of health implications in Pakistan. Each of these factors play a specific role that how the government decides how much money to spend in health sector. Regression analysis and the ordinary least squares (OLS) method were used to carry out the regression. When a model's dependent variable is quantitative, then this method and technique are applied in specified situation. The policy and a solution to all the problems that can be explained by the variables and household health spending will be achieved through estimates and outcomes.

KEYWORDS: Health expenditure, PSLM, region, employment status, marital status, service provider, age of household, family size, income level, OLS, regression.

Introduction

A positive outcome in the end may result from investments in the healthcare industry. It is valuable in advancing wellbeing results, diminishing neediness, and assist with animating financial development. In spite of the reality, the general wellbeing consumption remained squat in arising countries and the general public has no choice except for to bear medical care uses from their pockets, which has been continued as the fundamental wellspring of wellbeing supporting. In 2015, 32% of health spending worldwide was paid out of pocket. Out of these, World Wellbeing Association assesses that personal consumption on medical services offices affects forty one hundred 4100 million people into neediness every year. However, out-of-

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pocket health costs have a negative financial impact on nearly 150 million people (WHO, 2015). Health care costs or out-of-pocket expenses that exceed a predetermined threshold of a household's annual aggregate consumption or non-food expenses are considered catastrophic health expenditures. According to a WHO report from 2010, a country's public health expenditure of roughly 6% of GDP will reduce out-of-pocket expenses and make catastrophic health costs virtually nonexistent. In actuality, the typical worth of total wellbeing spending as a proportion of Gross domestic product for Pakistan during the period 2000-2016 stayed 2.78% with the most contemptable 2.36% in 2011 and with the most noteworthy of 3.34% in 2007. In 2016, Pakistan being a lower-center pay country has wellbeing consumption per capita of US-Dollar 40 with a personal use of 65.2 % of current wellbeing uses and 2.8% of complete wellbeing consumptions (level of Gross domestic product). When compared to other countries in the region, Pakistan's health indicators show poor health outcomes like high infant mortality, high population growth, and the lowest life expectancy. One potential explanation is that the wellbeing use of Pakistan is far lower than other territorial nations. As likewise expressed over that, Pakistan has been distributing not exactly or around 2% of Gross domestic product to wellbeing largely. For example, It has been projected from the relatively low degrees of public costs, personal consumptions assumed an extraordinary part in Pakistan at 65.2 % (percentage of current wellbeing uses), which is very high in a worldwide setting (where the normal is 18.5% in 2015-2016). Great mental and actual wellbeing of the populace is a significant determinant of financial development, human turn of events and destitution decrease in any country. According to a report from the World Health Organization (WHO), "each 10% improvement in life expectancy is associated with an increase in economic growth of about 0.3% to 0.4% per year, other growth factors being equal." Risk disinclined people will engage protection systems for of expanding their dangers. This enhancement of hazard is significant and takes on many structures, institutional and casual. In agricultural nations like India, Townsend (1995) finds that through casual components people can assimilate some wellbeing related gambles. However, according to Gertler and Gruber (2002), health shocks can have a significant impact on consumption and severely disrupt household welfare for more severe and chronic illnesses. There is comparative proof about the impact of wellbeing shocks corresponding to created nations, for example, the US where medical coverage as of not long ago was not compulsory. It has been documented there (see According to Feenberg and Skinner (1994) and Waters et al. (2004), illness can cause individuals to reallocate a significant portion of their spending to out-of-pocket (OOP) health expenses. In this way, it proposed to credit to a circumstance where wellbeing OOP consumptions surpass a basic portion of the family's complete expense the condition of devastating wellbeing use (Xu et al 2003; Wagstaff and van Doorslaer 2003). The critical threshold level is not exactly agreed upon. A few investigations pick up sides of 5% (Berki, 1986), 10% (Waters et al., 2004) and up to 40% of non-means spending

Azzani et al. (2019) carried out systematic research to determine the factors that contribute to CHE in nations with varying levels of income. The review showed families' monetary condition, the pervasiveness of hospitalization, the family with advanced age people, chorionic sick individual, and incapacitated people were the common variables connected with Family CHE. However, socioeconomic disparity plays a significant role in the prevalence of CHE worldwide, with low-income individuals more susceptible to financial hardship because of health care costs. This study suggests that to diminish financial disparity and medical services funding strategies ought to be amended to help individuals who should require more medical services.

Yazdi-Feyzabadi et al. (2018) found that urban families had a higher ability to pay and were less susceptible to CHE than rural residents were. However, the prevalence of CHE is higher

in Iran's rural areas, among people receiving inpatient and outpatient care, and among families with elderly members. Based on the findings of this study, it was suggested that health care coverage policies should be revised to better serve the underprivileged population.

According to Molla et al. (2017)'s research, which was based on the 2010 Bangladesh household income and expenditure survey, factors like household income, the presence of chronic disease, the number of family members, health shocks, and the prevalence of male members were significant predictors of household expenditures in Bangladesh and had a positive sign that is, increased expenditures. Constant sicknesses and wellbeing shocks ended up being the most important variables. The most fascinating in their finding is that rustic families save on OOP medical services installments than respondents in metropolitan regions controlling for all variables recorded previously. Creators make sense of it by the way that costly present day clinical benefits and specialists are generally accessible for the most part in metropolitan regions.

Lin (2009) has concentrated on the connection between monetary cycle and wellbeing uses. His results show that the unemployment rate is negatively and significantly correlated with total mortality, mortality rates from cardiovascular diseases, motor vehicle accidents, and infant mortality using data from eight Asia-Pacific countries from 1976 to 2003 and a fixed-effects regression model. This empirical evidence suggests that economic downturns may benefit health. In addition, self-destruction is found to move counter-consistently. The outcomes likewise show that joblessness influenced death rates in a quick and contemporaneous manner.

Xu et al. (2007) looked into the possibility of financial hardship caused by health care out-of-pocket costs. As a result, survey data from 116 countries, covering 89 countries, have been used to examine the Gini coefficient, demographic characteristics of people under the age of five and over 60, prepayment of taxes, and health insurance in high, low, and middle-income countries. This study's findings indicate that all nations experienced financial disaster. However, while issues become more severe in low-income nations, high-income nations are less affected than middle-income nations. The proportion of the population under the age of five remained insignificant, resulting in the provision of free immunizations for children across all income levels. On the other hand, the proportion of the population over sixty in middle-income nations increases the likelihood of financial disaster, but not in low-income or high-income nations. Protected individuals were saved from financial ruin by prepayment mechanisms, such as health insurance for high-income individuals or a tax-based system for low- and middle-income individuals. On the opposite side, personal costs have a positive connection with monetary calamity in all pay gatherings. Cleopatra and Eunice (2018) examined the incidence, intensity, and determinants of CHE in Nigerian households using various thresholds for analyzing catastrophic health expenditures and their determinants for various nations. The review showed the presence of extreme focus and event of devastating wellbeing costs in Nigeria that albeit changed under edges utilized. What's more, the determinants like financial status, age, abiding, work,

Rous and Hotchkiss (2002), who utilize the Nepal Expectations for everyday comforts Overview, additionally look at indicators of OOP installments. The issue of endogeneity in health status and provider selection are emphasized in this paper. Utilizing a different condition model, creators found that a few normal unnoticed elements related with medical care uses, sickness and the decision of a supplier were measurably huge. It very well may be the justification for the predisposition in various comparable examinations in the event that not controlled. Creators guarantee that pay straightforwardly affects wellbeing consumptions and in a roundabout way - probability of disease, picking the supplier. It is also noticed that people in cities spend less, but they typically use health services that cost more. This logical

inconsistency was made sense of by the way that rustic example frequently underreport their infections and in some cases utilize any medical services supplier.

Material and Methods

The foundation of research is data and technique. Without this idea, there can be no research objectives. Data provide the research project its direction, while methodology ensures the tools & procedures for model estimate.

3.1 <u>Data Range and Data Source</u>

To ascertain the household expenditure on catastrophic health expenditure in Pakistan, this investigation is founded on a household survey. The PSLM (Pakistan Social and Living Standard Measurement) Survey Round-VII 2018–2019 provided the statistics used to make this judgement. The data collection includes information about Pakistan's four provinces (KPK, Punjab, Sindh and Baluchistan). A cross-sectional survey with a sample size of 48968 people was conducted in Pakistan at random. Data from surveys is available at the household level and includes information on catastrophic medical costs as well as various socioeconomic factors, including income, region, income, family head age and employment status, province, household head education, number of children, and family head gender.

3.2 <u>Research Design</u>

The equation is estimated using the ordinary least square (OLS) approach and a linear regression methodology. The kind of dependent variables will determine the estimate strategy. We employ the OLS Method and regression analysis in this situation since the dependent variable is quantitative in character. The above-discussed Method and Technique can no longer be used since the dependent variable in this situation is qualitative-based in nature. The use of the regression analysis approach to estimate models is without dispute. All of the explanatory variables' measureable statistics and the reliability of those same variables will be provided by the estimated model. If the probability of the variable, or P value, is less than five percent (5%) or 0.05 or ten percent (10%) 0.10, the variable is statistically significant; otherwise, it is statistically insignificant.

We also employ the F statistic to assess the Model's overall performance. The power of the explanatory variable is sufficient to support the model if the probability value of the F test is less than 5%. In addition, the T Test is utilized to determine the importance of every variable. The P value is the same in terms of instance and circumstance as previously described. The contribution of the explanatory factors to the dependent variable's mean household expenditure on catastrophic health expenditure will be quantified by the estimated coefficients. The amount of the influence on the dependent variable will be explained by the model's coefficient.

3.3 <u>Econometric Model</u>

Forming the model's structure and defining its variables is crucial before beginning estimation and data analysis. The model demonstrates the nature and kind of variables while offering the framework and estimating methods. This model of multiple linear regressions will resemble the following.

Dependent variable $= A + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8x_8 + B_9X_9 + e$

$$\text{Dependent variable} \quad (Y) \quad = \text{Health Expenditure}$$

$$\text{Constant} \quad = C$$

X_1 = Number of Province

X_2 = Region (Urban or Rural)

X_3 = Employment status

X_4 = Marital Status

X_5 = Gender of Family Head (Male or Female)

X_6 = Health Provider Service

X_7 = Income of the households

X_8 = Size of the family

X_9 = Age of the family head

e =Error term

These models also need to explain categorical variables that will appear when the regression is being done. As an illustration, the first variable in the above structure is income, a quantitative variable that stays the same, but all other variables will be further recoded into single variables that constitute one category variable. We line up the entire categorical variable into their new variables that will help a lot to understand the regression in model and the real shape of model by clearing the results of the model.

. For instance, one variable is region, which is tested against household spending on catastrophic health expenses to determine what proportion of regions we regard to be urban and rural. The second factor is gender, which is further divided into Male and Female to determine the cost of health education based on gender. Province is the next variable since we want to test and examine household spending based on the patterns of people residing in Pakistan's four provinces. The provinces of Punjab, KPK, Sind, and Baluchistan are included in this categorical variable. Other factors will be taken into account using the same methodology

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.723	0.522	0.522	0.560

Table 4.1 (Researcher's own contribution, PSLM 2018-19)

The values of R square and adjusted R square that explain how each explanatory variable explains the variation in the dependent variable are reflected in table 4.1. In the regression mode, it depicts the variation in education expenditure that takes into account all independent

variables. The independent variables account for 52.2 percent of the variation in education costs, as evidenced by this.

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16276.646	64	254.323	812.384	0.000
	Residual	14878.666	47527	0.313		
	Total	31155.312	47591			

Table 4.2 (Researcher's own contribution, PSLM 2018-19)

The statistic of the F test, which includes the strength and power of all independent variables and their effects on the dependent variable, is depicted in this summary of table 4.2. The F statistic has a probability value of 0.000, which is statistically significant and suggests that the regression model as a whole is substantial. This F test demonstrates that the value of R square is statistically significant. The statistical significance of this relationship is determined by the overall F-test. We can conclude that the R-squared value is significantly different from zero if the overall F-test P value is less than the significance level. The Model Summary and ANOVA table, which exclusively addresses the model's performance and credibility, were discussed earlier. The focus of the research is now on discussing and interpreting the magnitude and impact of each variable on health expenditure. It will provide additional clarification regarding how each variable contributes to the total cost of heath. In order to comprehend the essence of this thesis, which was designed to comprehend the aspect of household health expenditure, we will plot the compare means and coefficients table.

HEALTH EXPENDITURE			
ILLNESS	Mean	N	Std. Deviation
LIVER DISEASE	4438.70	1486	9758.109
ROAD ACCIDENT	9538.65	440	28937.912
FRACTURES	6065.82	386	13421.599
DIARRHEAL DISORDER	1108.19	2175	2839.639
PNEUMONIA	3083.41	205	3558.030
FEVER	555.42	20637	1210.279
MALARIA	2592.38	1992	2828.314
TYPHOID	3344.48	841	4602.456
CHEST INFECTION	2190.75	1020	6185.740
ASTHMA	2950.57	763	2887.986
LIVER/KIDNEY DISEASES	6603.80	1271	15836.594
MEASLES, POLIO	2292.97	238	5777.237
STROKE/PARALYSES	7762.93	274	12486.781
MUSCULAR PAIN	2481.32	3401	6163.183
DEPRESSION	4917.18	388	5674.610
EYE INFECTION/DISORDER	4258.92	559	8913.710
ULCER DISEASE	3215.33	790	5368.542
HEPATITIS INFECTION	6367.23	835	10636.218
TUBERCULOSIS	4689.30	305	6930.515
DIABETES	2968.67	2644	4870.299
HEART DISEASE	10884.47	1044	60215.636
HIGH BP	2259.98	2007	3509.145
GUYENNE ISSUE	6698.61	850	11651.124
DOG BITES/SNAKE	5895.00	15	11173.589

DENTAL CARE	1992.47	232	4233.100
BURNS	4652.79	24	5389.061
BRAIN HEMORRHAGE	12863.29	63	14136.881
AIDS	6420.00	5	8425.188
CANCER	53695.33	99	136132.440
DON'T KNOW	2482.96	104	3289.326
OTHERS, SPECIFY	4017.59	3875	13880.834

Table 4.3 (Researcher's own contribution, PSLM 2018-19)

The exclusive table, Table 4.3, provides a clear representation of the mean amount each disease-bearing household spends on health, given the nature of the disease and the behavior of the family head or member, this spending seems very logical. This table indicates the names of disease and its expenditure respectively. There are total thirty-one diseases with respect to household expenses against each. We will consider all the diseases in the paper to access the pattern of household and their behavior for the determination of health expenditure. The above table clearly discloses the entire summary of each variable. It shows the name, mean expenditure, number of values taken or observation and standard deviation of each diseases. If we glance over the table above 4.3, we can see that it starts from liver and ends at other, specify disease. It highlights that each household or family head is willing to pay the specific amount of money on the health disease by them. We can observe that household is ready to spend on average 4439 Rs on liver disease per year.in the same way we can clearly analyze the expense on each disease by the household or family head. If we read out the entire table 4.3, we can see the information and trends of family members that how they spend on their health issues.

Model		Unstandardized Coefficients		Standardized Coefficients	T-Values	P-Values
		B	Std. Error	Beta		
1	(Constant)	2.942	0.060		48.658	0.000
	KPK	0.262	0.007	0.127	36.346	0.000
	Sindh	-0.096	0.002	-0.153	-42.927	0.000
	Baluchistan	-0.103	0.002	-0.148	-42.918	0.000
	Urban	0.038	0.003	0.046	14.206	0.000
	Employer, employing less than 10 person	0.068	0.050	0.004	1.361	0.174
	Employer, employing 10 or more persons	0.039	0.031	0.004	1.264	0.206
	Self-employed non-Agriculture	0.004	0.003	0.004	1.367	0.172
	Unmarried / Never Married	-0.032	0.008	-0.020	-4.141	0.000

	Widow / Widower	-5.000 E-6	0.005	0.000	-0.001	0.999
	Divorced	0-.020	0.013	-0.005	-1.508	0.132
	Separated	0.013	0.032	0.001	0.397	0.691
	Nikkah Solemnized but Rukhsati not taken place	0.011	0.013	0.003	0.888	0.374
	Male	-0.001	0.005	-0.001	-0.227	0.821
	Private Hospital	-0.015	0.010	-0.005	-1.511	0.131
	Homeopath/Hakeem	-0.116	0.007	-0.056	-17.409	0.000
	Government Hospital-THQ/DHQ	-0.067	0.001	-0.234	-68.448	0.000
	Dispensary	-0.056	0.003	-0.054	-17.024	0.000
	Military Hospital	-0.022	0.004	-0.018	-5.580	0.000
	Income of households	-0.029	0.011	-0.010	-2.768	0.006
	Family size	-0.006	0.004	-0.005	-1.420	0.156
	Age of family head	-0.031	0.009	-0.017	-3.488	0.000

Table 4.4 (Researcher's own contribution, PSLM 2018-19)

Because the models complete presentation and execution will be documented in this section. It will deduce the significance of each factor in relation to health spending. We will be able to comprehend each variable, its extent, and its effect on the dependent variable if we locate an overhead table (4.4).

The first variable for the discussion under health expenditure of household is province that will show the how one province is dissimilar from other in term of family expenditure for health. By taking Punjab province as base, we can conclude that there is difference between the spending level of people residing in Punjab and KPK. The people of Khyber Pakhtunkhwa spend 0.127 units comparatively more to the people who live in the Punjab province. However, Sindh and Baluchistan province have different trends in term of spending on health issues. Families of Sindh on average spend 0.153 units less as compared to Punjab families. Similarly, the people living in Baluchistan spend 0.148 on average also less as compared to Punjab Province on health diseases.

The next category is the area or location whether it matters the costs of health or not? It goes without saying that the amount a household spends on health depends a lot on where they live, such as in the city or the village. Results clearly demonstrate that urban residents spend 0.046 units more on health than urban residents, as its probability value is less than five percent.

The status of a household member's employment is the next factor that will affect how much the family will have to pay for a member's health care. This variable plays a significant role in determining how much families from different professions spend on health care. In this scenario, there are various subcategories of employment status, but paid employees have been chosen as the base category to determine the expenditure of subcategories.

In this type where the employer employs less than ten people and in the second class that is the employer, employing ten or more persons and last is category of self-employed non-agriculture households. The result in table 4.4 shows that there is no difference in spending on health related diseases between the paid employees and categories of employees mentioned above. The reason behind this is the probability values that can be very easily shown in the table above.

The next variable is marital status of the household. It investigates whether this status affects the health expenditure or not. We can see from table 4.4 that this variable has six sub categories in which researcher has taken currently married as base category. This category will draw difference that how family members acts differently in term of spending on health issues or disease. The above table shows that all sub categories have probability value as greater than five percent and showing these results statistically insignificant. This scenario indicates that there is no difference in term of spending on health between the currently married and all other categories.

Next variable in the analysis is gender of the household. It has been used in the model in order to determine whether the gender effects the health expenditure or not. The result in table above shows that gender does not matter in the way of spending towards the health as probability values of the coefficient exceeds the five percent and making gender impact as an ineffective.

The next category is type of health service provide. This category has further six categories in which one of these private doctor clinics has been kept as base category in the econometric analysis. All remaining categories will be compared this category to determine the expenditure of each household in different health services centers. We can judge from the table above that family members spend on average 0.005 units less in the private hospital as compared to private doctor clinic. This table and result also show that people who wish to get their treatment to Homeopath/Hakeem spend on average 0.056 units less as compared to base category mentioned. In the same way, those patients who visit to Government Hospital-THQ (Tehsil Head Quarter)/DHQ (District Head Quarter) are that type of health services where patients pay on average 0.234 units less as compared to patients visiting to private doctor clinics. The next sub category is dispensary where the researcher would like to estimate the mean health expenditure of the households for their health related diseases. It can assessed that those patients who attend this service are likely to pay on average 0.054 units less as compared to base category. If we further look into the matter then observe that family members who join Military Hospital consume 0.018 units less as compared to private doctor clinics.

Now this important factor will illustrate the trends and variation in the health expenditure based on household annually incomes. The table 4.4 shows that family members expenditure on different health diseases decrease on average 0.010 units if one unit income of household increase. The results is statistically significant as probability value of income is less than five percent as show in the above table. We can say that income plays an important role in the determination of household health expenses. Upcoming element that was considered is family size but this factor is quite ineffective as its P-value is greater than five percent making this variable effect definitely unproductive. Therefore, we can easily conclude for this family size that it does not effect on family health expense. Last factor of this examination is the age of the households whether it affects the health expense or not. The result in table 4.4 exposes that if

one unit or one-year age of the family members goes up then expense on health diseases decrease on average 0.017 units. There may be much cause as income and resources of the household may increases with the passage of time.

Conclusion

Because this study examines family spending on different health diseases. In this paper, we looked at a variety of socioeconomic and demographic variables to see how much a family spends on heath related issues. It suggests that a decrease in family expenditures on health must result from an increase in household income. Therefore, in order to improve the financial situation of people Pakistan, the government ought to take some serious steps. If we look at the situation in the provinces, we can see that there is a big difference in spending between outlying areas and states should give more health facilities to fix these health problems. The disparity in spending between urban and rural areas is yet another crucial aspect in term of spending on health. When compared to households who spend on health issues in urban areas, those who live in rural areas spend 4.6% less on health disease. The families of paid employees and those associated with businesses appear to have more difference in the amount they spend on their health related matters. People who work in fields that are related to agriculture, or in fields that are not related to agriculture do spend significantly more on their health disease describe in the table 4.3 than those who are paid employees. This situation demonstrates that people's businesses have frequently different nature and that the government ought to concentrate on both the agricultural and non-agricultural sectors. This is unquestionably a thinking situation for the government. This analysis does not take into account the type of marital status because it does not matter if this status is different in nature and affects more on health expenditure. Because this study examines family spending on health. In this paper, we looked at a variety of socioeconomic and demographic variables to see how much a family spends on medical diseases.

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