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Medical Expenditure and Household Welfare in Bangladesh

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BRAC Institute of Governance and Development
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Medical Expenditure and Household Welfare in Bangladesh

By

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Abstract

The reliance on heavy out-of-pocket expenditure for medical care leads to households getting trapped into a vicious cycle of poverty. In Bangladesh, private health care expenditure accounts for almost 64% of total health expenditure being financed from out-of-pocket (OOP). These escalating medical costs cause financial hardship for a majority of households and may even lead to welfare loss. Using household level data from Household Income and Expenditure Survey-2010 and applying log-linear regression estimation procedure, the study estimates the catastrophic impact of health expenditure on household welfare. Welfare loss is associated with reduction of 'food expenditure' and 'non-food expenditure'. The study finds that compared to households with no healthcare expenditure, households with non-catastrophic healthcare expenditure reduced food expenditure by 3.1% and households with catastrophic healthcare expenditure reduced food expenditure by 15.2%. Compared to households financing healthcare from internal sources, households with external financing reduced food and non-food expenditures by 5.57% and 1% respectively and households that finance healthcare from both internal and external sources reduced food and non-expenditures by 11.4% and 16% respectively. Our findings indicate that a catastrophic health event diverts household income to health care by a large amount (28.1%) which causes significant reduction in non-food expenditure. eventually causing substantial loss in household welfare. Catastrophic health events did not reduce food consumption significantly but it has a significant impact on non-food expenditure. Non-hospital medical expenditure such as cost of medicine was the primary cause of facing catastrophic health event.

Keywords: *Health Expenditure, Catastrophic Health Event, Health Financing, Welfare loss*

LIST OF ABBREVIATIONS

ADB = Asian Development Bank

BBS = Bangladesh Bureau of Statistics

BHW = Bangladesh Health Watch

CHE = Catastrophic Health Expenditure

HIES = Household Income and Expenditure Survey

OOP = Out-of-pocket


PSU = Primary Sampling Unit

WHO = World Health Organization

Background

Rising healthcare expenditure is a growing concern in Bangladesh. Nearly, 15.57% of the population with ill health does not seek treatment due to high healthcare expenditure (BBS 2010). There is a heavy burden of private health care expenditure on individuals that leads to 64% of total health expenditure being financed from out-of-pocket (OOP) against the global average of 35% (WHO, 2010). There has been a lot of debate among practitioners and health economists on how increasing medical care impacts households, particularly the rural ones. One of the main drivers of inequality in access to health care is increasing medical costs. This is because poor households are unable to afford services from modern and private medical service providers and in times of any catastrophic health events due to observed cost of treatment and medicines (ADB, 2012). Catastrophic health expenditures account for 22% of all shocks in the lives of poor households in Bangladesh (World Bank, 2008). In the backdrop of this increasing medical cost in events of health shocks, households face a bigger trade-off in terms of limiting or reducing their costs of living in order to afford the needed medical care (ADB, 2012). Thus, in the absence of proper and effective health financing strategy, the lower income group has been deprived of seeking proper healthcare when needed. The reliance on heavy out of pocket of expenditure leads to households being trapped in a vicious cycle of poverty in the event of a health shock that may lead to a fall in consumption expenditure below subsistence level and subsequent lower productivity of human capital, asset depletion, high indebtedness and thus further impoverishment. Therefore, improving poor people's ability to finance their health care at low-cost has a potential safety net and poverty-alleviating effect.

The incidence and extent of medical expenditure is extensively associated with the state of impoverishment in many studies. Empirical evidence from China reveals that the high cost of medicine in the absence of health insurance leads to increased financial hardship for the rural community (Liu et al, 2003). The empirical work by health experts in early 2000 has already set the background of association of health expenditure with state of impoverishment of any country. Further studies reveal that when the nature of this health expenditure changes the extent of impoverishment can be higher. In this regard a study in Vietnam argues that when health expenditure crosses a certain threshold of cumulative income, households may experience some level of welfare loss or impoverishing impact (Wagstaff et al, 2002). Thus, based on their analysis it was found that both incidence and intensity of 'catastrophe' were less concentrated among the poor over a period of time and that the state of impoverishment is mainly due to non-hospital medical expenditures. Over time, there has been an array of empirical studies addressing the extent that health expenditure may lead to welfare loss of households. The results indicate that poorer households in developing countries were less able to cope with any given level of health expenditure than richer households and hence were pushed towards impoverishment (Xu et al., 2003; Bhojani et al., 2012; Rashed and Sharaf, 2015). Further studies establish that households in middle-income and low-income countries are more prone to catastrophic payments for consuming health care, with one such notable example being India in the late 1990s. In India, nearly 70% of the 3202 households surveyed with chronic illness had to self finance their health cost, from where again 16% suffered financial catastrophe by spending more than 10% of their cumulative income (Bhojani et al., 2012). The prevalence of catastrophic expenditure was high amongst the poor, and the study suggests that high out-of-pocket expenses for chronic illness in India push households towards further impoverishment.



Thus, previous studies have set the rationale that high medical expenditure may have an impoverishing effect, particularly for rural households. The state of impoverishment necessarily reflects a household's state of welfare under any circumstances. The key notion of welfare loss of a household relies on the trade-off that the members face in events of a health shock (Nguyen et al., 2012; Rashad and Sharaf, 2015; Liu et al. 2003). Thus, it can be argued that with limiting household resources, the decision of financing healthcare will be highly associated with the reduction of consumption of other necessities such as consumption of food and non-food consumption. In this regard, a study by Nguyen et al. (2012) investigates the consumption and treatment patterns of Vietnamese households in 2008. The consumption pattern of food and non-food items is studied across households by controlling for level of inpatient and outpatient healthcare and income quintiles. It revealed that compared to households with no inpatient care and negligible outpatient care, households that were exposed to inpatient as well as a high degree of outpatient care were seen to reduce their consumption on food, education and other basic needs. Rashad and Sharaf in a recent study conducted in Egypt in 2015 also find similar results. In this case, the study reveals that in Egypt high healthcare costs push one-fifth of households into some financial catastrophe while 3% are pushed to extreme poverty. This is argued based on the background that the researchers found significant evidence of welfare loss in terms of reduction of these households' expenditure on non-food items. This argument stands in favor of circumstances where households have no alternate financing mechanism to mitigate unprepared health shocks. Thus, the trade-off of consumption of healthcare stands out to be higher for rural communities or households in the absence of an external or internal financing source.

As a consequence of expensive consumption of medical care, households are pushed into indebtedness and asset depletion. Loss of savings or capital, combined with the inadequacy of social security schemes in developing countries often force the poor into deeper poverty (and the low-income non-poor into poverty) by their limited ability to cope (BHW, 2011). The impact of catastrophic health shocks on households' consumption patterns and hence welfare is expected to be higher in low-income countries such as Bangladesh.

So far, no study has extensively investigated the link between households' medical care consumption and their welfare state in Bangladesh. This study took a broader stance that covers impoverishment along with other aspects of welfare loss of the households. Thus, the paper provides empirical evidence for the impact of medical cost on welfare of households in Bangladesh. The structure of the paper is as follows- the first section provides definition and concepts of Catastrophic Health Expenditure and presents arguments on how it is associated to household welfare loss. Given the rationale, the next section discusses the research design, choice of variables and model specifications to investigate the research objective. Then the paper presents a comprehensive discussion on the empirical findings and concludes with discussions on the major implications for policy suggestions in this context.

Defining and Contextualizing Catastrophic Health Expenditure (CHE)

Generally, health expenditure is defined to be catastrophic or income eroding when a household's out-of-pocket payments for health care exceed some threshold share of household expenditure (Berki 1986; Wyszewianski 1986; Pradhan and Prescott 2002; Wagstaff and Van Doorslaer 2003; Xu, Evans et al. 2003). Likewise, in another study Wagstaff et al. (2003) defines catastrophic payments as out-of-pocket expenditures on health care in excess of a given share of the total household budget. Xu et al. (2003) in their study assumed healthcare expenditure to be catastrophic if a household's financial contributions to the health system exceed 40% of income remaining after subsistence has been met. On the other hand, Donnell et al. (2005) examined the sources of variation in the incidence of catastrophic payments using 10% as threshold of the household budget.

Rama Pal (2010) argues that the same level of OOP expenditure may not be considered catastrophic for the rich as well as the poor. The idea is that for a poor household with limited income, a 5% spending on health may be more threatening than to a richer household with comparatively high-income level. Catastrophic health payments in most literature have been defined as the payment in excess of some given threshold value over net non-food expenditure. Since the consumption level varies between rich and poor households, preferences also vary when it comes to spending for health care, physician choices, and drugs uses.

Table 1: Distribution of Households Facing Catastrophic Health Expenditure in Bangladesh with Various Thresholds

Location	If Threshold is 20% of Non-food Expenditure	If Threshold is 30% of Non-food Expenditure	If Threshold is 40% of Non-food Expenditure	If Threshold is 50% of Non-food Expenditure
Urban	6.52%	4.78%	3.72%	2.96%
Rural	16.47%	12.25%	9.71%	7.83%
National	22.99%	17.03%	13.42%	10.79%

Source: Authors' Analysis from Household Income Expenditure Survey (HIES), 2010; BBS

Given the definition that has been established in previous studies, catastrophic health expenditure is defined to be greater than or equal to 40% of total non-food expenditure in this study. Four different thresholds are used to observe the variation in the percentage of households facing catastrophic health care expenditure. Table 1 reveals that there is a large variation in the percentage of the household facing catastrophic health care expenditure when the threshold was relaxed from 40% to 20%—a rise of 71.31%. However, a relatively small variation is observed when the threshold is relaxed from 50% to 40%. This depicts the sensitivity of defining catastrophic health expenditure moderately. Hence, findings of the study could be different if a rather moderate definition of catastrophic health care expenditure is incorporated.

Methodology

Data Source

The study is based on secondary data that is primarily collected by the Bangladesh Bureau of Statistics (BBS) in 2010. A two stage sampling design is adopted with systematically selected 612 Primary Sampling Units (PSUs) from 16 strata. Household Income and Expenditure Survey-2010 data is collected from 12,240 households—7,840 were from rural areas and 4,400 were from urban areas

and its correlates in Bangladesh. Valuable data is also received on household demographics and seeking of health care from the Household Income and Expenditure Survey-2010.

Variables

- *Food Expenditure (Y)*: Total household food consumption in a month is termed as food expenditure. Natural logarithm of food consumption is used as the dependent variable in the regression equation.
Income (X₁): Household income is the accumulation of all household members' income in a month.
- Due to lack of reporting of household income, the study uses household's monthly expenditure as a proxy for household income. Natural logarithm of the variable is used in the regression equation.
- *Types of Healthcare Expenditure (X₂)*: Health care expenditure is a categorical variable consisting of three categories: 1=no expenditure (base category), 2=non-catastrophic expenditure, and 3=catastrophic expenditure. No expenditure means the household has zero healthcare expenditure; non-catastrophic expenditure means the household has some healthcare expenditure but the amount is less than 40% of non-food expenditure; and catastrophic expenditure means healthcare expenditure of a household is greater than or equal to 40% of non-food expenditure.
- *Healthcare Financing Strategy (X₃)*: Healthcare financing strategy represents how households financed or managed resources for the cost of treatment. It is a categorical variable with three categories: 1=internal financing (base category), 2=external financing, and 3=both internal and external financing. Financing health care from regular income, household savings, selling household accessories, selling livestock, selling agricultural products/trees, selling of permanent assets, and mortgaging land and assets are termed as internal financing. Financing health care by borrowing from friends/relatives/office, borrowing from a moneylender, a donation from friends and relatives, and from other resources is termed as external financing. Financing health care from both internal and external sources constitutes the final category of both internal and external financing.
- *Types of Condition (X₄)*: Types of condition is also a categorical variable with three categories: 1=acute condition (base category), 2=chronic condition, and 3=both acute and chronic condition. If household members suffered from any episode of illness for a short duration in the last 30 days, the household is labeled as 'having acute condition'. If household members suffered from an illness that lasts for more than three months, the household is labeled as 'chronic condition'. If household members are found with both acute and chronic conditions, the household is labeled as 'both acute and chronic condition'.
- *HH Size (X₅)*: Household size represents the number of members of a household. Natural logarithm of the variable is used in the regression equation.
- *Sex of HH Head (X₆)*: Sex of the household head is a categorical variable: 1=household head is male (base category) and 2= household head is female.
- *Education of HH Head (X₇)*: Level of education of household head is categorized as 1=No-Education (base category), 2=Primary, 3=Secondary, and 4=Higher (above secondary level education).
- *Age of HH Head (X₈)*: Age of the household head is a categorical variable where 1=age up to 30 years (base category), 2= age between 31 and 45 years, 3= age between 46 and 65 years, and 4= age above 65 years
- *Location (X₉)*: Household location is categorized as 1=urban (base category) and 2=rural areas.

Method

The log-linear regression method is used to measure the elasticity of the outcome variables – household food expenditure and non-food expenditure—with respect to the explanatory variables. Two different types of model are employed for both of the outcome variables. In Model-1 and Model-2, $\ln(Y)$ is the outcome variable and seven explanatory variables, excluding health care financing strategy(X3) and types of condition (X4), are used as regressors. In Model-3 and Model-4 all the nine explanatory variables were used. The first model utilized the whole data set of 12,240 observations, whereas the second model utilized 6,574 observations because health financing strategy data is available only for households that finance healthcare expenditure followed by an event of sickness. Econometrically Model-1 and Model 2 are found to be the best Model, but Model-3 and Model-4 are more comprehensive with more relevant explanatory variables.

Models -1 and 2:

$$\ln(Y_i) = \beta_0 + \beta_1 \ln(X_{1i}) + \beta_2 X_{2i} + \beta_5 \ln(X_{5i}) + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9i} + \ln(\varepsilon_i)$$

Models -3 and 4:

$$\ln(Y_i) = \beta_0 + \beta_1 \ln(X_{1i}) + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 \ln(X_{5i}) + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9i} + \ln(\varepsilon_i)$$

Healthcare Expenditure Pattern in Bangladesh:

The findings suggest that about 53.46% of households incurred some healthcare expenditure (below 40% of non-food expenditure), whereas 13.42% of households faced catastrophic healthcare expenditure in a year. Table 2 is prepared on the 13.42% households facing catastrophic health expenditure and highlights the distribution of the amount of healthcare expenditure by types of health condition and source of financing health care. Among the households that face catastrophic health expenditure, 35% was due to acute condition, 15% was due to chronic condition, and 50% was due to both acute and chronic condition. This finding is in line with empirical evidence from a study in China where it is seen that nearly 44.3% of the rural population sample were pushed to below the poverty line due to increasing medical expenses (Liu et al., 2003). Likewise it is seen that a major portion of the rural population in India fell below the poverty line due to high inpatient and outpatient care like medicines and visit to doctors (Berman et al., 2010). Thus, a medical cost is an important cause of transitory poverty in many developing economies and our findings support this argument.

On such occasions, a major portion of medical expenses is financed by either internal savings or through borrowing from family and acquaintances which deepens the impact of impoverishment. Table 2 justifies this argument; it displays that about 82% households financed their out-of-pocket catastrophic health expenditure from internal sources, 12% households used external sources, and 6% households used both internal and external sources. About 50% households spent BDT 0-2500, whereas only 8.1% households spent above BDT 10,000. Hoque et al. (2012) conducted a study on the burden of costs of maternal health-related issues and their impact on livelihood of the rural women in Matlab, Bangladesh. The study reveals that maternal morbidity caused substantial loss in the form of selling of assets and loaning from peers in the post period, particularly for rural households. Similarly Busan et al. (2007) find that in rural India nearly 40

million individuals are pushed to poverty headcount due to increasing health expenditure, the only exception being the study did not consider the impact of alternate financing options such as savings.

Table 2: Distribution of OOP Expenditure on Catastrophic Health Events (40% >= Non-food Expenditure)

Household Characteristics	Amount (BDT) of Out-of-Pocket Expenditure					Total
	0-2,500	2,501-5,000	5,001-7,500	7,501-10,000	10,001 and Above	
Types of Health Condition						
Acute	22.6%	7.7%	2.6%	0.9%	1.8%	35%
Chronic	9.6%	2.7%	1.2%	0.4%	0.9%	15%
Both Acute and Chronic	28.6%	11.1%	4.2%	2.0%	3.7%	50%
Total	60.8%	21.5%	7.9%	3.4%	6.4%	100%
Source of Financing						
Internal Financing	51.2%	17.9%	5.6%	2.7%	5.1%	82%
External Financing	7.1%	2.4%	1.5%	0.4%	0.4%	12%
Both Internal and External Financing	2.5%	1.2%	0.9%	0.3%	1.0%	6%
Total	60.7%	21.5%	8.0%	3.4%	6.5%	100%

Source: Authors' Analysis from Household Income Expenditure Survey (HIES), 2010; BBS

The analysis is furthered to see what item-specific health care consumption contributes most to household's health expenditure. This also helps us to picture which medical expenditure may slide household towards vulnerability. Table 3 shows households' item-specific healthcare expenditure and corresponding total cost in the last 30 days of data collection.

Table 3: Average Healthcare Expenditure (BDT in a month) by Items for Catastrophic Health Events

Location	Consultation Fees	Hospital/Clinic Charges	Cost of Medicines	Cost of Test/ Investigation	Transport Cost	Other Charges	Total Cost
Urban	266	303	2,165	694	245	308	3,981
Rural	231	367	2,262	469	248	390	3,968
National	243	345	2,228	549	247	361	3,972

Source: Authors' Analysis from Household Income Expenditure Survey (HIES), 2010; BBS

Households facing catastrophic health expenditure spend on an average BDT 3,972 (national level) that may pose a household with a substantial financial burden. The cost of medicine contributed the most (56.09%) to the catastrophic health expenditure and averages at BDT 2,228. Following the high cost of drugs, other contributing items were the cost of investigation and hospital charges with averages of BDT 549 and BDT 345 respectively. The cost of the investigation was 47.97% higher in urban areas than rural areas. Items such as transport cost and other charges jointly constituted 15.31% of total healthcare expenditure. A report of ADB (2012) also depicts that cost of medicine and consultation fees of doctors are main determinants of high out-of-pocket expenditure on health which diverts poor families towards traditional healers. Again, our study resembles similar findings in context of medicine and other outpatient costs as a major share of the cost that may be a burden to households (Berman et al., 2010; Hoque et al., 2012 ; Galarraga et al., 2009; Liu et al., 2003).

Table 4 shows the variation in healthcare expenditure based on the types of condition prevailed in a household. Compared to households that suffered from only acute condition, households that suffered from both acute and chronic condition spent 51.17% higher on health care. Households with both acute and chronic condition spent 47.37% higher on consultation fees, 53.38% higher on medicine, and 78% higher on tests/investigation compared to households with only acute condition. Households with acute condition spent 33.19% higher on hospital/clinic charges compared to households with a chronic condition.

Table 4: Average Healthcare Expenditure (in a month) by types of condition for Catastrophic Health Events

Types of Condition	Consultation Fees	Hospital/Clinic Charges	Cost of Medicines	Cost of Test/ Investigation	Transport Cost	Other Charges	Total Cost
Acute Condition	190	317	1,757	378	199	313	3,154
Chronic Condition	230	238	1,844	423	191	336	3,263
Both Acute and Chronic Condition	280	406	2,695	673	298	416	4,768

Source: Authors' Analysis from Household Income Expenditure Survey (HIES), 2010; BBS

Measuring the Magnitude of Welfare Loss:

Having defined the factors that may contribute to proportionately high medical cost for households, the paper next investigates the impact of this expenditure pattern on household welfare. One of the assumptions of the study is that medical expenditure above a threshold level reduces share of other expenditure (food and non-food). This is more prominent in the absence of any alternate coping mechanism at times of catastrophic health events¹. Models 1 and 2 study the effect on food expenditure of households excluding two important variables: financing mechanism and health conditions. In Model-1, all the explanatory variables are statistically significant at 1% significance level². The coefficient of income gives us the income elasticity of food expenditure. Income elasticity of 0.875 indicates food expenditure increased with income, but less than proportionately— 8.75% for a 10% increase in income. Compared to households with no healthcare expenditure, households with non-catastrophic healthcare expenditure reduced food expenditure by 3.01% and households with catastrophic healthcare expenditure reduced food expenditure by 15.2%. The elasticity of household size is 0.104 which means increasing household size by 10% raised food expenditure by 1.04%.

¹ It must be noted that catastrophic health expenditure depicts the medical cost as a consequence of catastrophic health shocks. For instance, cost of treatment for cancer (a chronic health condition) is referred to by health economists as catastrophic health expenditure.

² R-squared value is 0.902 which indicates the model is a very good fit—90.2% variability of the food expenditure is explained by the variability of the explanatory variables

Table 5: Regression Analysis Output

VARIABLES	(1) Ln (Food Expenditure)	(2) Ln (Non-food Expenditure)	(3) Ln (Food Expenditure)	(4) Ln (Non-food Expenditure)
Ln (Income)	0.875*** (0.00741)	1.116*** (0.0114)	0.853*** (0.0116)	1.089*** (0.0168)
Type of Health Expenditure (base: No Expenditure)				
Non-Catastrophic	-0.0301*** (0.00323)	-0.00548 (0.00759)	-0.0558*** (0.0204)	-0.00253 (0.0485)
Catastrophic	-0.152*** (0.00624)	-0.281*** (0.0118)	-0.161*** (0.0207)	-0.269*** (0.0491)
Healthcare Financing Strategy (Base: Internal Financing)				
External	-	-	-0.0557*** (0.0115)	0.00932 (0.0218)
Both Internal and External	-	-	-0.114*** (0.0333)	-0.160*** (0.0502)
Types of Condition (Base: Acute Condition)				
Chronic Condition	-	-	0.0106* (0.00560)	-0.000709 (0.0125)
Both Acute and Chronic Condition	-	-	-0.0110* (0.00569)	0.0205* (0.0116)
Ln (Household Size)	0.104*** (0.00695)	-0.0938*** (0.0126)	0.129*** (0.0109)	-0.0794*** (0.0182)
Sex of HH Head (Base: Male)				
Female	-0.0387*** (0.00484)	0.101*** (0.0107)	-0.0398*** (0.00761)	0.102*** (0.0153)
Education of HH Head (No Formal Education)				
Have Formal Education	-0.0556*** (0.00370)	0.201*** (0.00796)	-0.0533*** (0.00543)	0.200*** (0.0109)
Age of HH (Base: Up to 30 Years)				
31-45 Years	-0.0150*** (0.00453)	0.0761*** (0.0110)	-0.0121* (0.00669)	0.0800*** (0.0150)
46-65 Years	-0.0208*** (0.00493)	0.0825*** (0.0116)	-0.0201*** (0.00745)	0.0927*** (0.0161)
Above 65 Years	0.0115* (0.00649)	-0.0149 (0.0158)	0.0220** (0.00980)	-0.0241 (0.0219)
Location (Base Urban)				
Rural	0.0244*** (0.00371)	-0.102*** (0.00799)	0.0191*** (0.00553)	-0.0988*** (0.0110)
Constant	0.768*** (0.0619)	-2.550*** (0.0965)	0.973*** (0.0995)	-2.329*** (0.148)
Observations	12,230	12,230	6,574	6,574
R-squared	0.902	0.750	0.882	0.730

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In Model-3, controlling for the healthcare financing strategy and types of condition, it is found that estimated coefficients possess the same signs and similar values of Model-1. Healthcare financing strategy is statically significant at 1% significance level, whereas the types of condition is not significant at even 5% significance level. Compared to a household that financed health care from internal sources, external financing reduced food expenditure by 5.57% and both internal and

external financing reduced food expenditure by 11.4%. This finding is consistent with other studies (Flores et al., 2008; Galarraga et al., 2010; Hoque et al, 2010 and Berman et al, 2010) which suggest that one of the main causes of health expenses are the temporary diversion of consumption of basic needs to finance healthcare. In most rural context, alternate strategy like selling of assets or cattle and borrowing forms major coping mechanisms to shield from health shocks.

Model-3 also depicts that compared to the households with no expenditure on health care, households with non-catastrophic healthcare expenditure reduced food expenditure by 5.58% and households with catastrophic healthcare expenditure reduced food expenditure by 16.1%.

In Model-3, all the explanatory variables are statistically significant at the 1% level. R-squared value is 0.750 which indicates the model is a very good fit—75% variability of the non-food expenditure is explained by the variability of the explanatory variables. Income elasticity of non-food expenditure is 1.16 which indicates that non-food expenditure is income elastic. A 10% higher income raised household non-food expenditure by 11.16%. Compared to households with no healthcare expenditure, households with non-catastrophic healthcare expenditure have no statistically significant difference in non-food expenditure, whereas households with catastrophic healthcare expenditure reduced non-food expenditure by 28.1%. The elasticity of household size shows that a 10% bigger household had about 1% lower non-food expenditure.

Female-headed households had about 10.1% higher non-food expenditure compared to male-headed households. A household head having formal education led to 20.1% higher non-food expenditure compared to a household head having no formal education. Compared to urban households, rural households spent 10.2% less on non-food items.

In Model-4, controlling for the health care financing strategy and types of condition, it is found that estimated coefficients possess the same signs and similar values of Model-2. Healthcare financing strategy is statistically significant at 1% significance level, whereas the types of condition are not significant at even 5% significance level. Compared to a household that financed health care from internal sources, external financing had no statistically significant difference in non-food expenditure, whereas both internal and external financing reduced non-food expenditure by 16% compared to the same base. In this model, compared to households with no expenditure on health care, households with non-catastrophic healthcare expenditure had no statistically significant difference in non-food expenditure, whereas households with catastrophic healthcare expenditure reduced food expenditure by 26.9%.

Discussion and Conclusion

The results in this study shows that non-hospital medical expenditure such as cost of medicine was the primary cause of facing a catastrophic health event. Wagstaff et al. (2002) found the same result in Vietnam. Households having members with both acute and chronic conditions are more prone to catastrophic health care expenditure as the result shows these households spent 1.5 times higher than households with only acute condition. Regression results show that food expenditure is income inelastic which means food expenditure is not very sensitive to income change that leads us to conclude that any financial shock that erodes household income should have a small effect on food consumption. In other words, health shock must reduce household income by a large amount to bring a mentionable reduction in food consumption. The paper also contributes to new evidence that catastrophic health care expenditure in Bangladesh caused households to reduce food consumption expenditure significantly (15.2%). Although the result will vary depending on the definition of catastrophic health expenditure, the findings are consistent with other literature in the context of other countries where similar findings were revealed. Our finding indicates that catastrophic health events divert household income by a large amount (17.37%) to health care which caused significant reduction in food expenditure and eventually household welfare.

We have also seen that households are forced to reduce non-food consumption expenditure by a large margin (28.1%) as well, compared to households that made no health care payment which causes significant welfare loss of the prior group. Households that financed health care expenditure from internal sources had relatively smaller welfare loss compared to households that finance health care from both external and a combination of internal and external sources. Hence, those household who were forced to finance from external sources (poor households) are more vulnerable to shocks and are losing welfare by a greater margin. To sum up, it can be concluded that catastrophic health care expenditure reduces household welfare significantly and may push households into indebtedness and asset depletion, and eventually into poverty.

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