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PREVALENCE OF HEALTH SHOCKS AND THE INFLUENCING FACTORS: EVIDENCE FROM RURAL BANGLADESH

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A B S T R A C T

To explore the factors associated with the prevalence of health shocks faced by low income people in rural Bangladesh is the major focus of the paper. This paper uses the country representative data called Bangladesh Integrated Household Survey (BIHS) which covers the period 2015 conducted by International Food Policy Research Institute (IFPRI). A simple Probit regression was performed to explore factors associated with the incidence of health shocks, particularly illness and skipping work due to illness. Several influencing factors of health shock exposure are identified; such as household characteristics, health care access and supply-side indicators such as accessibility to different facilities. The study finds that households prevalence to health shocks and experiences of illness are positively associated with increase in consumption while less educated and less affluent households are more hardly affected by health shocks. Access to medical facilities apart from access to financial markets is among the other major influencing factors of health shock prevalence. The finding of the paper is expected to provide evidence for policy-makers in designing health protection mechanisms and targeting the affected people.

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INTRODUCTION

Health is an economic indicator of development. Health depicts not only the physical comfort but also the harmonious wellbeing of physical, cognitive, social and emotional wellbeing of a human being (WHO, 1948). A healthy population means valuable human capital which specifies productive and active work force (Bloom et al., 2004). Numerous studies indicate that better health leads to better work and wage and ultimately smooths consumption, better livelihood, investment decision and many more (Paul and Gruber, 2002; Thomas and Strauss, 1997). Ensuring sound health for every citizen of the country is the prime goal of policy makers.
The unpredicted nature of illness causes a high direct and indirect cost. Health shock particularly illness incurs indirect costs by limiting the ability to work and reducing income (Daley et al. 2009). On the other hand, an affected individual needs extra care and expenditures for treatment which is a direct cost. Besides, there is opportunity cost of taking care of sick family member (Genoni 2012). Therefore, illness or health shock is the major idiosyncratic shock that adversely affects the wellbeing of rural people (Asfaw and Braun 2004; Gertler and Gruber 2002).

In developing countries like ours where there is no functioning formal health insurance, people face welfare loss through selling asset, borrowing from informal sources, reducing consumption and so on. While a health shock is defined as any family member suffering an illness, an injury, or death, households deplete their stock of total liquid assets in the event of exposure to shocks, which is an important field to investigate in targeting safety net and other policy perspectives (Dercon and Hoddinott, 2004; Rakib and Matz, 2016).

In Bangladesh total expenditure on health is 2.8% of the GDP (WHO, 2018). Many of the empirical works on health shocks, and on income shocks in general, has focused on assessing if households can insure total consumption when shocks occur (e.g., Gertler and Gruber, 2002). The multifaceted nature of health shocks and the limited understanding of the determinants is a major lacking for designing effective interventions. Therefore, it is important to understand the severity of health shocks and the influencing factors which correlate with the exposure to health shocks.

MATERIALS AND METHODS

The investigation of health shock has become a major concern now-a-days. A good number of research works exist on various types of shocks especially on climatic shocks though health shock has been comparatively less travelled. Among the literature on health shocks, some previous works investigated the effects of health shocks on economic indicators either in urban and rural areas (Wagstaff, 2007; Mitra, 2015). Others worked on the determinants of health (Currie 1999; Pitt 1997; Hartwig, 2008). Health shock is the most unpredictable, burdensome but common of all shocks (Krishna, 2010; Adam Wagstaff, 2010). Losses in utility or social welfare can be used as a measure of health shock. The economic costs of illness include both the cost of seeking health care and the loss of income associated with a fall in labour supply and productivity (Genoni 2012). From the previous literature it is found that there are two important economic costs allied with illness – i) the cost of the medical care used to diagnose and treat the illness, and ii) the loss in income associated with reduced labor supply and productivity (Dhanraj 2014). This large cost suggests that the indirect cost of a household member being sick and not being able to work has severe consequences.

Consequences of health shocks can be measured through food and non-food consumption, income, asset, medical cost, health itself. All of these indicators increase the economic cost of seeking health care, fall in income or asset, fall in labor supply, and fall in productivity (DeLeire, and Manning, 2004, Dercon and Krishnan, 2000). Thus the economic consequences can be dire and people may be trapped into persistent poverty (Dercon and Hoddinott, 2004; Grant, 2005). Skipping work due to illness reduces wages (Schultz and Tansel, 1997) while severity of health shock also affect the consumption insurance (Gertler and Gruber, 2002; Wagstaff, 2005).

In developing countries like ours, a huge inequality arises due to socioeconomic differences. Through proper policy endeavors these disparity could be minimized. But relatively smaller amount of studies have examined the exposure and factors associated with health shocks particularly in Bangladesh (Grant 2005, Santos et al. 2011, Wagstaff 2007). Consumption smoothing in times of health shocks depends on several factors such as, severity of the health shocks (Cochrane 1991), employment status of members facing health shocks (Kochar 1995), ownership of human and physical capital of households (Gertler and Gruber 2002), access to credit (Islam and Maitra 2012) etc. In facing health shocks, households in Indonesia are unable to smooth consumption (Gertler and Gruber, 2002). Over time, exposure to health shocks may lead to a drawing down of savings, forced borrowing at high rates of interest, and sale of physical assets, perhaps further dropping income flows if this includes land, livestock or production tools and equipment (Paul et al. 2016).

Data and Variables

Data

The country representative data used in this study called Bangladesh Integrated Household Survey (BIHS) which covers the period 2011 conducted by International Food Policy Research Institute (IFPRI). The data is representative at the following levels: (1) nationally representative of rural Bangladesh; (2) representative of rural areas of each of the administrative divisions of the country (3) representative of the Feed the Future (FTF) Zone of Influence (ZOI) in south-western Bangladesh. A stratified sampling in two stages was used to calculate the total BIHS sample size of 6,500 households in 325 primary sampling units (PSUs) or villages by using the sampling frame developed from the community series of the 2001 population census of Bangladesh.

Description of Variables

A simple probit model is estimated to investigate the factors associated with health shock incidence. The dependent variable is health shock which is consisted of i) death and ii) illness in the household level. Death is defined whether the main income earner in the family member or any other family member died in the last 5 years (after the baseline). Illness shock is defined if the household incurred loss of income due to illness or injury of household member or if there is medical expenses due to illness or injury of household member. Therefore, health shock is defined if the household with binary dependent variable that takes a value of 1 if any member of the household was sick for any kind of coping strategy, and 0 otherwise has been used by household when they get affected by two types of health shocks such as, death and illness. This study measured health shocks in household level on the notion that health shocks such as illness are mostly contagious in nature and often affects all members of the households. Besides, the activity and exposure of one household member affects the other member explicitly. Death of a household member on the other hand, affects the whole household especially the death of an earning member.

Among the independent variables, household characteristics such as - gender, occupation and age of household head, educational qualification measured in number of years etc. are included. Supply-side determinants in terms of access of health and supportive facilities could be major influencing factors of health shock prevalence and outcomes especially in developing countries (Das and Hammer 2014). Access to different types of facilities are measured by - access to safety net, distance to nearest health-care center, access to health care center, access of the household to adequate food. Welfare indicators such as household total consumption expenditure, total value of productive asset, total income of the household etc. are included in the study. The years of education represents the number of years of formal schooling completed by the household head. Dummy variables are used for household access to food for past one month and household food expenditures are measures related to household current income level. Total value of assets is the monetary value of all assets owned by the household. Total value of land is measured in decimal whenever household has land ownership. Access to nearest health care facility is measured as binary response. The remaining variables are included to capture dimensions of household diversification. Another dummy variable identifies whether or not the household is engaged in agricultural daily wage labor or not.

RESULTS

Table 1 shows the descriptive statistics of major variables included in the model. Household monthly income is 6211 BDT while only 2.79% of the income is spent on education expenditure while the proportion of medical expenditure for male and female is 14.71% and 9.28% respectively while it is 61.30% and 38.60% of the total medical expenditure of the households. Though the total consumption expenditure is higher than total income of the households on an average, they have a high amount of loan money in general. Household heads on an average are middle aged and with below primary education. However, the mean ownership of productive and natural asset is 3,588 BDT and 99 decimal of land.

Table 1. Descriptive Statistics of major variables

Variable	Mean	Std. Dev.
Total household monthly income	6211	7253
Total consumption expenditure	8798	11977
Education expenditure	173	446
Medical expenditure for male members	914	3940
Medical expenditure for female members	577	1258
Medical expenditure for households	1491	4117
Current loan	41052	149037
Current value of productive asset	3588	19381
Plot size in decimal	99	156
Age of HHH	47	14
Education of HHH	3	4
N	6040	

Notes: Source: Author's computations based on the survey data, 2015

Table 2 presents the health shock related variables and some variables which basically reflects the accessibility of the households in different facilities and rights. 20 percent of the households are suffered by illness shocks while more than 3 percent are suffered by death. Overall, 22.60 percent households experienced either illness or death shock. 80 percent shock affected households was sick for 5 days or more while almost 76 percent of the affected households skipped work due to illness which is quite notable in low income households. Percentage of these two health shocks are higher because the respondents were working age population and they responded only if they had faced these particular shocks during the period of last 4 weeks.

Among the accessibility related variables, households are reported having sufficient accessibility in food, health care safety net etc. Approximately 69% households have taken loan even though 5 percent households have NGO access, which reflects that households took loan from informal sources. People under health shock may find it difficult to escape from sudden shocks and uses many coping mechanism, taking loan is one of those.

Table 2. Health Shock and other access related variables in 2015

Variables	Percentage
Health Shock Variables	
Illness	20.00
Death	3.20
Health shock	22.60
Sick for 5 days or more (n=1365)	80.26
Skipped work due to illness (n=1365)	75.73
Variables on Accessibility	
Access to food availability	89
Access to food sufficiency for a day	95.21
Access to NGO	4.75
Taken loan	69.19
Firm occupation	36
Access to safety net	43.2
Access to health care centre	92.80

Notes: Source: Author's computations based on the survey data, 2015

Determinants of health shock prevalence

Empirical model of single-equation Probit model is estimated. A set of binary dependent are estimated where the variables are 1 if the households suffer and 0 otherwise.

Table 3 summarizes the results of marginal effects of Probit to find the determinants of prevalence of health shocks. Columns (1), (2) and (3) show – i) household experienced health shock, ii) affected by illness and iii) skipped work due to illness. Two broad categories of independent variables are included such as household socio-economic characteristics and access related variables. Results in column (1) and (2) suggest that, lower income households are more likely to be affected by shocks. The result is similar to the findings of Wagstaff and Lindelow (2008). However, Health shock and prevalence and illness exposure are correlated to higher household consumption expenditure and households borrowed larger amount of loan. Previous studies find that, households do not sacrifice consumption rather work longer hours in times of health shock or smooth consumption in other ways (Cameron and Worswick 2003; Islam and Maitra 2012; Townsend, 1994; Kochar 1995).

Educated household heads are less likely to be affected by health shocks while older households are as expected to be more probable to experience illness or death. Dhanraj (2014) and Lundborg et al. (2011) also found supportive result for households with elderly members. This is in line with the positive relationship of health and education found by Arendt (2004). Health shock is negatively associated to education and nutrition of household members (Dercon and Krishnan 2000; Sun and Yao 2010). Variables related to access to facilities such as access to NGO, access to safety net program, access to health care are positively correlated to health shocks and illness exposure which are quite expected because, NGO, safety net program and health care access are more likely to improve the health condition of people both directly and indirectly (Khan, 2010). Wagstaff and Lindelow (2008) also found association between health shock exposure and access to health care, infrastructure etc. Access to food availability and day long food sufficiency are on the other hand, negatively associated with exposure to illness and health shocks.

Table3. Results of marginal effects of probit of determinants of Health Shock Prevalence

Variables	Health shock (1)	Illness exposure (2)	Skipped work due to illness (3)
Socio-economic characteristics			
Log of total HH consumption expenditure	0.026***	0.026***	0.025***
	(0.007)	(0.007)	(0.007)
Log of Total HH income	-0.017***	-0.011***	0.012***
	(0.003)	(0.003)	(0.003)
Log of current loan	0.005***	0.005***	0.007***
	(0.001)	(0.001)	(0.001)
Log of current value of productive asset	-0.002	-0.003	-0.001
	(0.002)	(0.002)	(0.002)
Age of HHH	0.001**	0.000	0.001
	(0.000)	(0.000)	(0.000)
Education of HHH	-0.004***	-0.002	-0.002
	(0.001)	(0.001)	(0.001)
Occupation in firm	-0.032***	-0.002	0.007
	(0.012)	(0.011)	(0.012)
HH dependency ratio	-0.102***	-0.034	0.089***
	(0.026)	(0.026)	(0.027)
Variables on Accessibility			
Access to NGO	0.271***	0.258***	0.051**
	(0.031)	(0.030)	(0.025)
Access to safety net program	0.014**	0.025**	0.008
	(0.011)	(0.011)	(0.011)
Access to health care	0.041**	0.045***	0.075***
	(0.020)	(0.018)	(0.023)
Access to food availability	-0.039*	-0.045**	-0.057***
	(0.029)	(0.021)	(0.019)
Access to day long food sufficiency	-0.010	-0.014**	-0.045
	(0.029)	(0.029)	(0.028)
Number of obs.	6039	6039	1365
Pseudo R2	0.034	0.031	0.021

Source: Calculated by Author from the BIHS Data, 2015.
Notes: Robust standard errors are given in parentheses; *p < .10. **p < .05. ***p < .01.

Column (3) however shows the influencing factors of skipping work due to illness. This is indirect cost of households by sacrificing income in time of illness. Those households reported health shock experienced are only included in the model. Our sample households are mostly hand to mouth belonging to low income and low education group. Therefore, skipping work due to illness reflects the severity of the shock for them. The result shows that, relatively affluent households with high income are more likely to skip work due to illness. The more the loan amount and consumption expenditure, the higher possibility of skipping works due to illness. Probably loans are taken to cover the increased consumption and forgone income for skipping works in the low income households (Morduch 1995). Households with more dependents also skipped work due to illness probably because they have more responsibility to take care of their dependents in case of illness which is similar to the findings of (Dhanraj, 2014) who found vulnerability of health shocks are higher for households with dependents and disabled members. Health care and NGO access are likely to induce skipping works probably because of having instant loan, health care services and essential information

regarding taking rest etc. make them to skip work and getting well soon rather prolonging the time of illness by not skipping. This is in line with previous literature which found that both employee and employer incur higher costs due to absenteeism. Employee loss earnings while employers face loss of production due to skipping works (Pohl and Neilson, 2013). Food availability is likely to reduce the severity of the shock which is expected in the perspective of our sample households.

CONCLUSION

People who are vulnerable to shocks and factors which influence their vulnerability is important to know for effective policy measures such as targeting of public health insurance schemes. The study complements the existing works by identifying factors correlates to health shock experiences. Health shocks are likely to affect lower income people more while positively correlates to consumption expenditure. Consumption expenditure responds positively to health shock variables suggesting that households cannot smooth their consumption in the face of health shocks.

Supply-side factors of health care such as medical care access are associated with health shock and skipping works due to illness. The result suggests that financial protection and supply side factors should be implemented simultaneously for reducing health shock prevalence and thereby, the economic losses associated with the health shocks (Dupas 2011). The paper also highlights that social safety net programs help households manage their health shocks. Access to financial market is associated with higher health shock and illness exposure. Results show that poorer households are hardly hit by health shocks while illness and death take tools by putting them in the vicious circle of loan and ultimately trapped into poverty. It is recommended that an easy access to formal loan with less interest with the aim to mitigate the health shock might be beneficial for the affected people.

However the study has limitations as uses cross sectional data and self-reported health shocks as the dependent variable. Economic consequence due to health shocks might vary across households. Besides, health shocks might affect in individual level as well as might differ by gender. Further research can consider these issues looking more into direct and indirect cost perspective.

CONFLICT OF INTERSEST

The author declares no conflict of interest.

REFERENCES

1. Arendt J N, 2005. Does education cause better health? A panel data analysis using school reforms for identification. Economics of Education Review, 24: 149-160.
2. Asfaw A and J von Braun, 2004. Is consumption insured against illness? Evidence on vulnerability of households to health shocks in rural Ethiopia. Economic Development and Cultural Change, 53(1): 115-129.
3. Bloom D E, Canning D, and Sevilla, J, 2004. The effect of health on economic growth: A production function approach. World Development, *32*(1): 1-13.
4. Cameron LA and Worswick C, 2003. Labour supply responses to crop loss in Indonesia. Review of Development Economics, 7(2): 327-341.
5. Cochrane JH, 1991. A simple test of consumption insurance. Journal of Political Economy, 99(5): 957-976.
6. Currie J and Madrian B C, 1999. Health, health insurance and the labor market. Handbook of Labor Economics, 3: 3309-3416.
7. Daley M, Morin C M, LeBlanc M, Grégoire JP, and Savard J, 2009. The Economic burden of insomnia: direct and indirect costs for individuals with insomnia syndrome, insomnia symptoms, and good sleepers. Sleep, 32(1): 55-64.

8. Das J, and Hammer J, 2014. Quality of primary care in low-income countries: facts and economics. The Annual Review of Economics, 6: 1–23.
9. DeLeire T and Manning W, 2004. Labor Market costs of Illness: Prevalence Matters. Health Economics, 13(3): 239-250.
10. Dercon S and Hoddinott J, 2004. Health, shocks and poverty persistence. Insurance Against Poverty, 123-136.
11. Dercon S and Krishnan P, 2000. In sickness and in Health: Risk sharing within Households in Rural Ethiopia. Journal of Political Economy, 108(4): 688-727.
12. Dhanaraj S, 2014. Health shocks and coping strategies: State health insurance scheme of Andhra Pradesh, India. WIDER Working Paper 2014/003, United Nations University, UNU-WIDER.
13. Dupas P, 2011. Health Behaviour in Developing Countries. Annual Review of Economics, 3(1): 425-449.
14. Genoni M, 2012. Health shocks and consumption smoothing: evidence from Indonesia. Economic Development and Economic and Cultural Change, 60: 475–506.
15. Gertler P and Gruber J, 2002. Insuring Consumption against Illness. The American Economic Review.
16. Grant U, 2005. Health and Poverty Linkages: Perspectives of the chronically poor, Background Paper for the Chronic Poverty Report 2008-09, February.
17. Hartwig J, 2008. What Drives Health Care Expenditure? Baumol's Model of 'Unbalanced Growth' Revisited. Journal of Health Economics, 27: 603–623.
18. Islam A and Maitra P, 2011. Health Shocks and Consumption Smoothing In Rural Households: Does Microcredit Have A Role To Play? *Journal of Development Economics.*
19. Khan FU, 2010. Economic consequences of health shocks and coping strategies: Evidence from urban poor households in Bangladesh. Dissertation, The Hague: International Institute of Social Studies.
20. Kochar A, 1995. Explaining Household Vulnerability to Idiosyncratic Income Shocks. The American Economic Review, 85(2): 159-164.
21. Krishna A, 2010. One Illness Away: Why Poor People Become Poor and How They Escape Poverty. Journal of International Development. Oxford: Oxford University Press, ISBN 978-0-19-958451-2, (h/b), pp. 229.
22. Lundborg P, Nilsson M and Vikström J, 2011. Socioeconomic Heterogeneity in the Effect of Health Shocks on Earnings: Evidence from Population-Wide Data on Swedish Workers. IZA Discussion Paper No. 6121.
23. Mitra S, Palmer M, Mont D, Groce N, 2015. Can Households Cope with Health Shocks in Vietnam? Health Economics, 25(7): 888-907.
24. Morduch J, 1995. Income Smoothing and Consumption Smoothing. Journal of Economic Perspectives, 9(3): 103–114.
25. Rakib M and Matz J A, 2016. The Impact of Shocks on Gender-differentiated Asset Dynamics in Bangladesh. The Journal of Development Studies, 52: 377- 395.
26. Paul L, Elabed G, and Gash M, 2016. Resilience and Health Shocks The potential of health savings accounts and health loans, CGAP Working Paper, January.
27. Paul G and Gruber J, 2002. Insuring consumption against Illness. The American Economic Review, 92: 51-70.
28. Pitt M M, 1997. Estimating The Determinants of Child Health When Fertility and Mortality are Selective. Journal of Human Resources, 32: 129-158.
29. Pohl V, Neilson C, Parro F, 2013. Health Shocks, Education, and Labor Market Outcomes. Working paper, 2014.
30. Santos I, Sharif I, Rahman H Z, Zaman H, 2011. How do the poor cope with shocks in Bangladesh? Evidence from survey data. Policy Research Working Paper 5810. The World Bank, South Asia Region, Social Protection Unit, September.
31. Schultz T P and Tansel A, 1997. Wage and labour supply effects of illness in Cote d'Ivore and Ghana: Instrumental variables estimates for days Disabled. Journal of Development Economics, 53(2): 251e286.

32. Sun A and Y Yao, 2010. Health Shocks and School Attainments in Rural China. Economics of Education Review, 29: 375-382.
33. Thomas D and Strauss J, 1997. Health and wages: Evidence on Men and Women in Urban Brazil. Journal of econometrics, *77*(1): 159-185.
34. Townsend R M, 1994. Consumption Insurance: An Evaluation of Risk-Bearing Systems in Low-Income Economies. The Journal of Economic Perspectives, 83-102.
35. Wagstaff A, 2007. The Economic Consequences of Health Shocks: Evidence from Vietnam. Journal of Health Economics*,* 26 (2007) 82–100.
36. Wagstaff A and Lindelow M, 2014. Are Health Shocks Different? Evidence from a Multi-Shock Survey in Laos. Health Economics, 23(6):706-18.
37. Wagstaff A, 2005. The Economic Consequences of Health Shocks. World Bank Policy Research, World Bank.
38. Wagstaff A, 2007. The Economic Consequences of Health Shocks: Evidence from Vietnam. Journal of Health Economics, 26: 82–100.
39. World Health Organization (WHO), 1948. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.
40. World Health Organization (WHO), 2018. Health SDG Profile: Bangladesh. https://apps.who.int/iris/bitstream/handle/10665/276833/sdg-profile-Bangladesh-eng.pdf?sequence=5&isAllowed=y