

Title: Households' out-of-pocket expenditure for healthcare in Bangladesh: A health financing incidence analysis

Running head: Financing incidence analysis households' out-of-pocket expenditure

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Abstract

Background: Despite improvements in many health indicators, providing access to affordable healthcare remains a considerable challenge in Bangladesh. Financing incidence analysis will enable an evaluation of how well the healthcare system performs to achieve equity in health financing. The objective of this study is to assess the burden of out-of-pocket (OOP) cost on different socio-economic groups by assessing the health financing incidence because OOP cost dominates household expenditure on health in Bangladesh.

Methods: The study was conducted using latest Household Income and Expenditure Survey (HIES) 2016. We focused mainly on four specific indicators: level of monthly household OOP cost on in-patient care, urban-rural differences in OOP cost, socio-economic status differences in different payment mechanisms and the Kakwani index. Descriptive statistics were employed to analyse and summarise the selected variables based on the SES and location of residence (e.g., rural and urban).

Results: The study showed the overall OOP healthcare expenditure was 7.7% of the household monthly income while the poorer income group suffered more and spent up to 35% of their household income on healthcare. The Kakwani index indicated that the poorest quintile spends a greater share of their income on healthcare services than the richest quintile.

Conclusions: This study observed that OOP cost in Bangladesh is regressive, i.e., poorer members of society contribute a greater share of their income. Therefore, policymakers should initiate health reforms for developing and implementing risk-pooling financing mechanisms such as social health insurance to achieve the Universal Health Coverage in Bangladesh.

Keywords: Financing Incidence, healthcare, out-of-pocket cost, Bangladesh.

1| INTRODUCTION

Despite improvements in many health indicators in the last few decades globally, providing access to affordable healthcare remains a considerable challenge in many low- and middle-income countries including Bangladesh.¹⁻³ Healthcare financing system is a key determinant of catastrophic healthcare expenditure. Bangladesh uses a combination of different healthcare financing strategies, including general revenue taxation, out-of-pocket payments, development partners' contributions and others including insurance.⁴ Indeed, out-of-pocket (OOP) expenditure is one of the most noteworthy payment strategies for healthcare in Bangladesh, and the share of OOP expenditure has been increasing alarmingly from 55.9% in 1997 to 67% in 2015.⁴ As a consequence, approximately 16% of the households face catastrophic health expenditures and almost 5 million people fall into poverty every year.⁵⁻⁸ Nevertheless, the larger share of public expenditure on health and better risk pooling mechanisms, such as social health insurance has proven to be one of the most effective financing mechanisms for tackling the financial hardship against high healthcare expenditure.^{9,10} One of the key targets of the Sustainable Development Goal 3 is to achieve universal health coverage (UHC), a priority objective of the World Health Organization (WHO) to ensure healthcare for all. UHC means that all individuals and communities receive the health services they need without suffering financial hardship.¹¹ However, 100 million people are pushed into extreme poverty around the world annually because of OOP expenditure to access healthcare.¹²

Out-of-pocket cost is defined as the cost or expenses incurred by individuals or households at the time of receiving any healthcare services. These includes the component of cost-sharing (the part not covered by a third party like an insurer) and informal payments (e.g., tips and under-the-table payments), but excludes insurance premiums and any reimbursements from the third-party payers (e.g., health insurance fund).¹² OOP cost includes any payment related to medical fees, purchases of medicines (prescribed or not), user fees for public care and payments for equipment and diagnostic tests.⁸ Households often manage to pay

such excessive expenditures by borrowing from others, selling assets/mortgage, family savings, donation from relatives, bank loans and others.^{13,14} Bangladesh has achieved impressive improvements in all health indicators, including maternal- and child-mortality-related indicators, nutrition and tackling communicable diseases.¹⁵ One of the reasons behind this improvement is the well-structured healthcare delivery system organized through community clinics, health and family welfare centres, Upazila (sub-district) health complexes, district-level hospitals, tertiary-level medical college and specialized hospitals. Over the past two decades, private sectors along with non-government organizations (NGOs) have engaged in healthcare delivery on a significant scale in Bangladesh. Households typically visit multiple providers for treatment care due to the nature of the pluralistic healthcare system.^{16,17} Care seekers are often charged a small user fee to access public health facilities, while relatively large OOP cost are required to access the healthcare services from any private providers, and thus, are often inaccessible for low-income people.¹⁸

Healthcare seeking is a complex behavioural process that varies due to the different socioeconomic and demographic characteristics of care seekers, perceived need, quality of healthcare providers, accessibility and service availability, convenience, cost of seeking care and even the opportunity costs of the services.¹⁹⁻
²⁵ The nature and extent of a disease, duration of illness and communication system can also be important predictors of whether and where to seek care during illness.²⁶⁻²⁸ The age and sex-specific utilization patterns vary among different age groups which often depends on a particular health problem and is reflected on total healthcare expenditure.²² Although a number of literature^{16,17,19-28} has focused on the extent and factors associated with OOP cost, health financing incidence analysis is rarely examined,^{28,29} particularly in the context of Bangladesh although such analysis is vital for policymakers to assess who pays for healthcare and the distribution of payments according to the socio-economic status of the people. The objective of this study is to assess the burden of OOP cost on different socio-economic groups by assessing the healthcare financing incidence. This study may be useful in the development of specific financing policy actions such as social health protection scheme for removing financial barriers and improving equity in health financing

in line with the core objective of the Healthcare Financing Strategy of Bangladesh to achieve universal health coverage.³⁰

2| MATERIALS AND METHODS

2.1| Financing incidence analysis

Financing incidence analysis (FIA) assesses how the incidence of OOP cost is distributed through healthcare financing mechanisms.²⁹ FIA is an important tool to assess how equitable a health financing system is because it shows who pays for the healthcare and how the payment mechanisms are distributed across socio-economic strata or measure of the ability to pay (ATP).³¹ Indeed, FIA is able to measure the disparities in health service utilization and payments for healthcare across people of various segments of the society.³² FIA is an important part of the analysis of equity in healthcare financing because it can measure whether a country's healthcare payment mechanism is progressive or regressive. A progressive or equitable healthcare payment system occurs when the rich contributes a relatively higher proportion of their ATP than poor, and the system is regressive if the opposite is the case.³³ In this context, health financing through taxation, OOPP, development partners' contributions and insurance could be measured separately.^{4,34} According to the latest national health account, OOP cost has been observed to be the main payment strategy in Bangladesh (67% of the total healthcare expenditure) and about 92.3% of the private financing is covered by OOP costs.³⁵ Therefore, in the FIA in this study, we focused on household healthcare payments using out-of-pocket expenditure (OOPP).

2.2 | Study design and data

The study utilized secondary data from the latest Household Income and Expenditure Survey (HIES) 2016. HIES in Bangladesh is a periodic cross-sectional survey conducted every five years by the Bangladesh Bureau of Statistics (BBS). Data collection was conducted from April 2016 to March 2017. The sampling frame was developed based on Bangladesh Population Census 2011 data. The HIES 2016 followed a stratified two-stage cluster sampling design. In the first stage, a total of 36 Primary Sample Units (PSUs) was drawn from each district by applying a systematic sampling technique. After the selection of the PSUs,

a complete household listing was performed. The detailed sampling technique, survey design and methodology and data quality control have been described elsewhere.³⁶ Before starting the actual survey operation, intensive training was provided to the enumerators and supervisors while strong supervision and quality control measures were conducted regularly. The HIES dataset contains socio-demographic variables, including family earnings, employment, consumption and expenditures, assets, housing conditions, healthcare utilization of individuals and expenditure on health, along with other key variables. A total of 186,207 individuals from 46,075 households were included in the sample through a two-stage stratified random sampling technique. Among the sample, about 34,752 individuals seeking care were identified and these individuals provided complete information on their healthcare expenditure.

2.3 | Data Analysis

The FIA analysis was confined to the distribution of OOP cost because it is the dominant financing mechanism in Bangladesh.^{4,29} In this analysis, we focused on four indicators: level of monthly household OOP cost on inpatient care, urban-rural differences in OOP cost, socio-economic differences in different payment mechanisms and the Kakwani index.³⁷ Descriptive statistics were employed to analyse and summarise the selected variables by socio-economic status and location of residence (e.g., rural and urban). The chi-squared (χ^2) statistic was computed to indicate statistical significance. The cost burden is expressed as the total OOP of healthcare costs as a percentage of the monthly income of the households.³⁸ The Kakwani index was computed by plotting the concentration curve of OOP cost with the Lorenz curve of total household income, which was used as a measure of ATP.³¹ The progressivity of OOP cost was assessed using the Kakwani index ranges between -2 and 1.³⁷ A positive Kakwani index indicates OOP cost is progressive i.e., richer households contribute proportionately more than their share of income while a negative Kakwani index indicates the OOP cost is regressive i.e., poorer households contribute greater than their share of income. The details, methods and interpretation have been described elsewhere.^{37,39} Results were presented as an average, standard deviations with mean differences, in US\$ applying the exchange

rate (US\$ 1 = 85 BDT). All data cleaning, validation and statistical analyses were performed using Stata/SE 14.0 (StataCorp. College Station, TX, USA).

3 | RESULTS

3.1 | Background Characteristics

A total of 34,752 individuals who received treatment care at various healthcare facilities were included in this analysis (Table 1). Approximately 90% (n=31,306) received out-patient care in the past 30 days. The mean age of patients was 28 (SD ± 19.8) while 11% were under-five children. More than half of the patients were married (60%). About 43%, 41% and 10% of patients completed primary, secondary and tertiary levels of education respectively, while only 6% of patients had no education. Among the individuals, 33% (n=11,046) were income earners of their family. The average healthcare expenditure of households was BDT 1,265 while urban dwellers spend slightly higher (BDT 1,340) than rural residents (BDT 1,235). We observed that respondents from the rural areas had worse-off economic status compared to urban dwellers.

(Table 1 will be inserted here)

3.2 | Cost burden across population group

The cost burden due to treatment care is presented in Table 2. There is no significant relationship between the place of residence and the average income and healthcare expenditure of the household. However, households' average income and average monthly healthcare expenditure varied significantly ($P < 0.0001$) among the income groups. The use of OOP cost increased as socio-economic status of the household increased. The richest group spend more (BDT 1,660) than the lower-income groups. This analysis observed that the average OOP healthcare cost was 7.7% of the monthly income of the household. However, the situation is worst for the lower-income group because almost all of them except the richest spend 10% of their household income while the poorest household spend 35% of their total income, which is three times higher regarding cost-burden threshold.³⁸

(Table 2 will be inserted here)

The concentration curve for the OOP healthcare payments and the Lorenz curve of total household income shows that both are distributed in favour of the better-off income groups (Figure). We observed that the lower 60% of households incurred about 50% of OOP cost. However, when we compared the OOP cost distribution with the distribution of total income, the Kakwani index was found to be regressive with a value of -0.463, indicating that the poorest quintile spent a greater share of their income on healthcare services as compared to the richest quintile.

(Figure will be inserted here)

3.3 | Source of funds for OOP cost

The various funding sources of households for mitigating healthcare cost across population groups are shown in Table 3. It was observed that during the treatment course, household savings (51%) was the main source of OOP cost followed by household income (43%). The other sources of OOP payment were borrowed money (32%), assistance from friends/relatives (23%) and assets sold or mortgage (18%). Regarding the residence of households, household savings was the key source of OOP cost in both urban and rural households. However, the tendency of assets sold (23%) is higher in rural areas than urban household (10%). A similar finding was also observed in terms of the socio-economic status of the households (Table 3).

(Table 3 will be inserted here)

4 | DISCUSSION

Over the past decade, many low-and middle-income countries have focused on achieving equity in healthcare financing through universal healthcare coverage. Bangladesh has made significant improvements in the healthcare sector due to a well-structured healthcare system involving the public, private sectors and NGOs.^{40,41} Nevertheless, household OOP payment (67%) is still the key payment strategy for healthcare.³⁰ As a result, many households face catastrophic healthcare expenditure annually.⁵ Earlier a benefit incidence analysis showed that overall healthcare benefits in Bangladesh are pro-rich due

to high dependency on private providers.¹⁸ Though a comprehensive set of policies are available for achieving universal healthcare coverage, equitable healthcare financing system is still an enormous challenge in Bangladesh.³⁰ The current study examined the distribution and the extent of the burden of OOP cost across socio-economic groups using financing incidence analysis which has rarely been examined in the Bangladesh context.

Our analysis showed that the overall OOP healthcare expenditure was 7.7% of the monthly income of the household in Bangladesh. Indeed, the poorer income group suffered more than the richest and poorest income group spend about 35% of their household income. Various studies documented that such reliance on OOP payments causes severe financial hardship and even impoverishment to the households in Bangladesh.^{5,6,42} Various reasons cause the high OOP cost in Bangladesh. First, only a small portion of the government budget is allocated to the healthcare sector, currently 5% of the government's budget in 2018–2019.⁴³ Second, because of the high dependency on private provision for healthcare, the private sector has dominated the healthcare sector in Bangladesh which often results in unnecessary costs.^{15,44,45} An earlier study in this context observed that the medicine cost (61.38%) and physician fee (13.38%) were the main cost drivers of OOP expenditure because of the unregulated private market in Bangladesh.⁴⁶ Many people seek care from local medical assistants, drug sellers and traditional healers which also often results in excessive cost.²³ Various pre-payment healthcare schemes, such as the community-based healthcare scheme and micro healthcare insurance schemes were recommended in the latest Bangladesh Healthcare Financing Strategy 2012–2032.³⁰ However, till now only 2% of the total healthcare expenditure comes from healthcare insurance.³⁵ In this context, the burden of OOP will be reduced if a larger portion of the population can access the pre-payment and pooling mechanisms not seen currently in Bangladesh.^{47,48}

The study observed that the current healthcare financing strategy in Bangladesh is regressive, i.e., the proportion of OOP healthcare expenditure contributed by the poorer households is greater than their share of income. A systematic review of the literature on this issue showed that, unlike Bangladesh, many Asian countries including Thailand, Malaysia and Sri Lanka found a progressive financing system.⁴⁹ A

progressive financing system is the opposite, i.e., better-off households contribute a higher share of their income towards healthcare expenditure.^{31,33,49} In sub-Saharan Africa, many countries, such as Kenya, Ghana, Tanzania and South Africa observed a progressive healthcare financing system that had a contrasting scenario with what we found for Bangladesh.⁵⁰⁻⁵³ Indeed, taxation and mandatory healthcare insurance were found mainly in their FIA studies and were often considered less regressive as compared to OOP payment.⁴⁹ Similar to our findings, a study conducted in Thailand observed that the healthcare financing strategy is regressive for OOP cost, but by including taxation, the distribution of healthcare burden becomes progressive.⁵⁴ However, such findings were not observed for China and Brazil where the healthcare financing burden was found to be regressive including taxation.^{55,56} This nature is driven largely by highly regressive OOP payments that we found in Bangladesh. Indeed, OOP payment has a negative effect on households, particularly for the poorer segment of societies.^{46,57,58}

As in earlier studies, we also observed that reliance on OOP often forced people to choose harder coping mechanisms such as borrowing, assistance and even asset selling or mortgage, particularly among poorer segment of the societies.⁵⁹ However, many households still had no adequate opportunities to access the healthcare services because they cannot afford to pay.^{60,61} Several studies in various settings have shown that the incidence of catastrophic OOP cost is higher in the rural households than in urban households.⁶²⁻⁶⁴ Moreover, poor people are often more prone to uncertainty in their income during illness and thus, the burden of OOP expenditure may even be higher with severe consequences for their daily livelihood.^{65,66} Hence, to avoid the dependency of OOP payment, the recent Sustainable Development Goals (SDGs) place considerable emphasis on healthcare financial sustainability and affordability. In line with SDGs, an affordable social healthcare protection scheme can mitigate high OOP payment issues which are in line with the national healthcare financing strategy of Bangladesh.³⁰ The Government is currently piloting the Shasthyo Shuroksha Karmasuchi, which is a social healthcare protection scheme that targets low-income people and provide them with comprehensive inpatient care according to their healthcare needs.⁶⁷

This study has several limitations. The study relied on data obtained from a national household survey, which is subject to recall and reporting bias among other problems. We did not utilize the general tax revenue or insurance contribution for measuring FIA. Thus provides a limited perspective of FIA. We did not also measure the catastrophic health expenditures from health care payments, which are often used to measure health financing equity. Further, because of the cross-sectional nature of this survey, we could not provide evidence of a causal relationship. Similar to earlier studies, the data contain a large number of zero OOP payments, and therefore, we limit our analysis only for inpatient cases who provided complete information on their household income and healthcare expenditure.^{46,68} Despite these limitations, study findings can be generalised to the national level because the study gathered data from a nationally representative household income and expenditure of Bangladesh.

5 | CONCLUSION

The present study focused on the burden of OOP spending on households in Bangladesh. Our study observed that OOP payment, which is the main payment mechanism for healthcare financing in Bangladesh, is regressive that places a heavier burden on the poor. Therefore, policymakers should initiate health reforms for developing and implementing risk-pooling financing mechanisms such as social health insurance, which is in line with the healthcare financing strategy of Bangladesh to achieve Universal Health Coverage.

References

1. World Health Organization. *World Health Statistics: Monitoring Health for SDGs.*; 2016.
2. Goepfel C, Frenz P, Grabenhenrich L, Keil T, Tinnemann P. Assessment of universal health coverage for adults aged 50 years or older with chronic illness in six middle-income countries. *Bull World Heal Organ.* 2016;94(September 2015):276–285C.
3. Goepfel C, Frenz P, Tinnemann P, Grabenhenrich L. Universal health coverage for elderly people with non-communicable diseases in low-income and middle-income countries: a cross-sectional analysis. *Lancet.* 2014;384:S6. doi:10.1016/S0140-6736(14)61869-9
4. MOHFW. *Bangladesh National Health Accounts 1997–2015: Preliminary Results.* Dhaka, Bangladesh; 2015. <http://www.thedailystar.net/backpage/people-fork-out-most-1465246>.
5. Khan JAM, Ahmed S, Evans TG. Catastrophic healthcare expenditure and poverty related to out-of-pocket payments for healthcare in Bangladesh- An estimation of financial risk protection of universal health coverage. *Health Policy Plan.* 2017;32(8):1102-1110. doi:10.1093/heapol/czx048
6. Hamid SA, Ahsan SM, Begum A. Disease-specific impoverishment impact of out-of-pocket payments for health care: Evidence from rural Bangladesh. *Appl Health Econ Health Policy.* 2014. doi:10.1007/s40258-014-0100-2
7. Van Doorslaer E, O'Donnell O, Rannan-Eliya RP, et al. Catastrophic payments for health care in Asia. *Health Econ.* 2007;16(11):1159-1184.
8. Van Doorslaer E, O'Donnell O, Rannan-Eliya RP, et al. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. *Lancet.* 2006;368(9544):1357-1364.
9. Kuwabata K, Xu K, Carrin G. Preventing impoverishment through protection against catastrophic

- health expenditure. *Bull World Health Organ.* 2002;80(8).
10. Xu K, Evans DB, Kawabata MK, Zeramdini R, Klavus J, Murray CJ. Household catastrophic health expenditure: a multicounty analysis. *Lancet.* 2003;362:111-117. doi:10.1016/S0140-6736(03)13861-5
 11. WHO. *Tracking Universal Health Coverage.* Geneva, Switzerland: World Health Organization Geneva, Swizerland; 2015. http://www.who.int/about/licensing/copyright_form/en/index.html.
 12. WHO. *Tracking Universal Health Coverage: 2017 Global Monitoring Report.*; 2017. doi:ISBN 978-92-4-151355-5
 13. Flores G, Krishnakumar J, O'donnell O, Doorslaer E Van. Coping with health-care costs: implications for the measurement of catastrophic expenditures and poverty. *Health Econ.* 2008;17(February):1393-1412. doi:10.1002/hec
 14. Hoque ME, Dasgupta SK, Naznin E, Al Mamun A. Household coping strategies for delivery and related healthcare cost: findings from rural Bangladesh. *Trop Med Int Heal.* 2015;20(10):1368-1375. doi:10.1111/tmi.12546
 15. MOHFW. *Health Bulletin 2017.* Dhaka, Bangladesh; 2017. www.dghs.gov.bd.
 16. Sarker AR, Sultana M, Mahumud RA, Sheikh N, Meer R Van Der, Morton A. Prevalence and Health Care Seeking Behavior for Childhood Diarrheal Disease in Bangladesh. *Glob Pediatr Heal.* 2016;3:1-12. doi:10.1177/2333794X16680901
 17. Sarker AR, Sheikh N, Mahumud RA, Sultana M. Determinants of adolescent maternal healthcare utilization in Bangladesh. *Public Health.* 2018;157:94-103. doi:10.1016/j.puhe.2018.01.010
 18. Khan JAM, Ahmed S, MacLennan M, Sarker AR, Sultana M, Rahman H. Benefit incidence analysis of healthcare in Bangladesh – equity matters for universal health coverage. *Health Policy*

Plan. 2016;32(3):1-7. doi:10.1093/heapol/czw131

19. Sikder SS, Labrique AB, Craig IM, et al. Patterns and determinants of care seeking for obstetric complications in rural northwest Bangladesh: analysis from a prospective cohort study. *BMC Health Serv Res.* 2015;15(1):166. doi:10.1186/s12913-015-0832-1
20. Koenig MA, Jamil K, Streatfield PK, et al. Maternal Health and Care-Seeking Behavior in Bangladesh : Findings from a National Survey Maternal Health and Care-Seeking Behavior In Bangladesh : Findings from a National Survey. *Int Fam Plan Perspect.* 2016;33(2):75-82.
21. Armitage CJ, Norman P, Conner M. Can the Theory of Planned Behaviour mediate the effects of age , gender and multidimensional health locus of control ? *Br J Health Psychol.* 2002;7:299-316.
22. Sarker AR, Mahumud RA, Sultana M, Ahmed S, Ahmed W, Khan JA. The impact of age and sex on healthcare expenditure of households in Bangladesh. *Springerplus.* 2014;3(1):435.
<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4153877&tool=pmcentrez&rendertype=abstract>. Accessed October 21, 2014.
23. Rahman A, Rahman M. Sickness and Treatment : A Situation Analysis among the Garments Workers. *Anwer Khan Mod Med Coll J.* 2013;4(1):10-14.
24. Helman CG. In: Culture, health and illness. 3rd ed. Oxford: Butterworth-Heinemann. In: Fifth. CRC Press; 1995:101-145.
25. Chrisman N. The health seeking process: An approach to the natural history of illness. *Cult Med Psychiatry.* 1977;1(4):351-377.
26. Ahmed SM, Adams AM, Chowdhury M, Bhuiya A. Gender, socioeconomic development and health-seeking behaviour in Bangladesh. *Soc Sci Med.* 2000;51(3):361-371. doi:10.1016/S0277-9536(99)00461-X

27. Ahmed SM, Tomson G, Petzold M, Kabir ZN. Socioeconomic status overrides age and gender in determining health-seeking behaviour in rural Bangladesh. *Bull World Heal Organ*. 2005;83(2):109-117.
28. Larson CP, Saha UR, Islam R, Roy N. Childhood diarrhoea management practices in Bangladesh: private sector dominance and continued inequities in care. *Int J Epidemiol*. 2006;35(6):1430-1439. doi:10.1093/ije/dyl167
29. Onwujekwe O, Hanson K, Ichoku H, Uzochukwu B. Financing incidence analysis of household out-of-pocket spending for healthcare: Getting more health for money in Nigeria? *Int J Health Plann Manage*. 2014;29(2):174-185. doi:10.1002/hpm.2166
30. MoHFW. *Expanding Social Protection for Health: Towards Universal Coverage Health Care Financing Strategy 2012-2032*. Dhaka, Bangladesh; 2012.
31. Ataguba JE, Asante AD, Limwattananon S, Wiseman V. How to do (or not to do) ... a health financing incidence analysis. *Health Policy Plan*. 2018;33(3):436-444. doi:10.1093/heapol/czx188
32. O'Donnell O, van Doorslaer E, Rannan-Eliya RP, et al. The incidence of public spending on healthcare: Comparative evidence from Asia. *World Bank Econ Rev*. 2007. doi:10.1093/wber/lhl009
33. Wiseman V, Asante A, Price J, et al. Ten best resources for conducting financing and benefit incidence analysis in resource-poor settings. *Health Policy Plan*. 2015;30(8):1053-1058. doi:10.1093/heapol/czu108
34. O'Donnell O, van Doorslaer E, Rannan-Eliya RP, et al. Who pays for health care in Asia? *J Health Econ*. 2008;27(2):460-475. doi:10.1016/j.jhealeco.2007.08.005
35. MOHFW. *Bangladesh National Health Accounts 1997-2015*. Vol 306. Dhaka, Bangladesh; 2018.

36. BBS. *Report on the Households Income and Expenditure Survey 2016*. Dhaka, Bangladesh; 2019.
37. Kakwani NC. Measurement of Tax Progressivity: An International Comparison. *Econ J*. 1977;87(345):71-80.
38. Grietens KP, Boock AU, Peeters H, Hausmann-Muela S, Toomer E, Ribera JM. “It is me who endures but my family that suffers”: Social isolation as a consequence of the household cost burden of buruli ulcer free of charge hospital treatment. *PLoS Negl Trop Dis*. 2008;2(10):1-7. doi:10.1371/journal.pntd.0000321
39. O’Donnell O, Doorslaer E van, Wagstaff A, Lindelow M. *Analyzing Health Equity Using Household Survey Data. A Guide to Techniques and Their Implementation*. Washington, D.C., USA; 2008.
40. MOHFW. *Bangladesh Health Bulletin 2015*. Dhaka, Bangladesh; 2015. doi:10.1017/CBO9781107415324.004
41. NIPORT. *Bangladesh Demographic and Health Survey 2014*. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International; 2016.
42. Wagstaff A, van Doorslaer E. Catastrophe and impoverishment in paying for health care: With applications to Vietnam 1993-1998. *Health Econ*. 2003;12(11):921-934. doi:10.1002/hec.776
43. The daily Star. JS passes national budget FY 2018-19. *The Daily Star*. <https://www.thedailystar.net/bangladesh-national-budget-2018-19/jatiya-sangsad-passes-national-budget-for-2018-19-fiscal-year-1596727>. Published June 28, 2018.
44. Sarker AR, Sultana M, Ali N, et al. Cost comparison and determinants of out-of-pocket payments on child delivery care in Bangladesh. *Int J Health Plann Manage*. 2018;33(4):e1232-e1249. doi:10.1002/hpm.2615

45. Khan JAM, Ahmed S, Sultana M, et al. The effect of a community-based health insurance on the out-of-pocket payments for utilizing medically trained providers in Bangladesh. *Int Health*. 2019;1-12. doi:10.1093/inthealth/ihz083
46. Mahumud RA, Sarker AR, Sultana M, Islam Z, Khan J, Morton A. Distribution and determinants of out-of-pocket healthcare expenditures in Bangladesh. *J Prev Med Public Heal*. 2017;50(2). doi:10.3961/jpmph.16.089
47. WHO. *Health Systems Financing: The Path to Universal Health Coverage*. World Health Report 2010. Geneva, Switzerland; 2010.
48. Devadasan N, Seshadri T, Trivedi M, Criel B. Promoting universal financial protection: Evidence from the Rashtriya Swasthya Bima Yojana (RSBY) in Gujarat, India. *Heal Res Policy Syst*. 2013;11(1):1-8. doi:10.1186/1478-4505-11-29
49. Asante A, Price J, Hayen A, Jan S, Wiseman V. Equity In Health care financing in low-and middle-income countries: A systematic review of evidence from studies using benefit and financing incidence analyses. *PLoS One*. 2016;11(4):1-20. doi:10.1371/journal.pone.0152866
50. Mills A, Ataguba JE, Akazili J, et al. Equity in financing and use of health care in Ghana, South Africa, and Tanzania: Implications for paths to universal coverage. *Lancet*. 2012. doi:10.1016/S0140-6736(12)60357-2
51. Akazili J, Garshong B, Aikins M, Gyapong J, McIntyre D. Progressivity of health care financing and incidence of service benefits in Ghana. *Health Policy Plan*. 2012. doi:10.1093/heapol/czs004
52. Mtei G, Makawia S, Ally M, Kuwawenaruwa A, Meheus F, Borghi J. Who pays and who benefits from health care? An assessment of equity in health care financing and benefit distribution in Tanzania. *Health Policy Plan*. 2012. doi:10.1093/heapol/czs018

53. Chuma J, Maina T, Ataguba J. Does the distribution of health care benefits in Kenya meet the principles of universal coverage? *BMC Public Health*. 2012. doi:10.1186/1471-2458-12-20
54. Limwattananon S, Vongmongkol V, Prakongsai P. The equity impact of Universal Coverage: health care finance, catastrophic health expenditure, utilization and government subsidies in Thailand. *Consort Res Equitable Heal Syst*. 2011. www.crehs.lshtm.ac.uk.
55. Chen M, Chen W, Zhao Y. New evidence on financing equity in China's health care reform--a case study on Gansu province, China. *BMC Health Serv Res*. 2012. doi:10.1186/1472-6963-12-466
56. Ugá MAD, Santos IS. An analysis of equity in Brazilian health system financing. *Health Aff*. 2007. doi:10.1377/hlthaff.26.4.1017
57. Zhao Y, Oldenburg B, Mahal A, Lin Y, Tang S, Liu X. Trends and socio-economic disparities in catastrophic health expenditure and health impoverishment in China: 2010 to 2016. *Trop Med Int Heal*. 2019. doi:10.1111/tmi.13344
58. Gotanda H, Jha AK, Kominski GF, Tsugawa Y. Out-of-pocket spending and financial burden among low income adults after Medicaid expansions in the United States: quasi-experimental difference-in-difference study. *Bmj*. 2020:m40. doi:10.1136/bmj.m40
59. Rahaman HZ, Choudhury LA. *Social Safety Nets in Bangladesh*. Vol 02. Dhaka, Bangladesh: Power and Participation Research Centre (PPRC); 2012.
[https://www.undp.org/content/dam/bangladesh/docs/Publications/Social Safety Net Volume-2 qxd.pdf](https://www.undp.org/content/dam/bangladesh/docs/Publications/Social%20Safety%20Net%20Volume-2.qxd.pdf).
60. Killingsworth JR, Hossain N, Hedrick-Wong Y, Thomas SD, Rahman A, Begum T. Unofficial fees in Bangladesh: Price, equity and institutional issues. *Health Policy Plan*. 1999;14(2):152-163. doi:10.1093/heapol/14.2.152

61. Nahar S, Costello A. Research report. The hidden cost of “free” maternity care in Dhaka, Bangladesh. *Health Policy Plan*. 1998;13(4):417. doi:10.1093/heapol/13.4.417
62. Abu-Zaineh M, Romdhane H Ben, Ventelou B, Moatti JP, Chokri A. Appraising financial protection in health: The case of Tunisia. *Int J Health Care Finance Econ*. 2013. doi:10.1007/s10754-013-9123-8
63. Somkotra T, Lagrada LP. Payments for health care and its effect on catastrophe and impoverishment: Experience from the transition to Universal Coverage in Thailand. *Soc Sci Med*. 2008. doi:10.1016/j.socscimed.2008.09.047
64. Rahman MA, Rahman MM. Sickness and Treatment: A Situation Analysis among the Garments Workers. *Anwer Khan Mod Med Coll J*. 2013. doi:10.3329/akmmcj.v4i1.13678
65. Selden TM. Uncertainty and health care spending by the poor: The health capital model revisited. *J Health Econ*. 1993. doi:10.1016/0167-6296(93)90043-E
66. Bloom DE, Canning D. *Population Health and Economic Growth*. Washington DC, USA; 2017. doi:10.1142/9789813220768_0006
67. Ahmed S, Hasan MZ, Ahmed MW, et al. Evaluating the implementation related challenges of Shasthyo Suroksha Karmasuchi (health protection scheme) of the government of Bangladesh: A study protocol. *BMC Health Serv Res*. 2018. doi:10.1186/s12913-018-3337-x
68. Molla AA, Chi C, Mondaca ALN. Predictors of high out-of-pocket healthcare expenditure: an analysis using Bangladesh household income and expenditure survey, 2010. *BMC Health Serv Res*. 2017;17(1):94. doi:10.1186/s12913-017-2047-0

Tables

Table 1: Background characteristic of the study participant

Variables	Urban (n=9,865)		Rural (n=24,887)		Total (n=34,752)	
	N	%	N	%	N	%
Type of care						
Out-patient	8,720	88.39	22,586	90.75	31,306	90.08
In-patient	1,145	11.61	2,301	9.25	3,446	9.92
Age category (in years)						
Less than 5	1,041	10.55	2,647	10.64	3,688	10.61
5-18	2,644	26.8	7,074	28.42	9,718	27.96
19-60	5,560	56.36	13,289	53.4	18,849	54.24
More than 60	620	6.28	1,877	7.54	2,497	7.19
Average age (mean \pm SD)	28.0	19.2	28.2	20.0	28.1	19.8
Sex						
Male	4,887	49.54	12,557	50.46	17,444	50.2
Female	4,978	50.46	12,330	49.54	17,308	49.8
Education (N=23,922)						
No education	425	5.88	1,054	6.31	1,479	6.18
Up to primary	2,736	37.85	7,621	45.65	10,357	43.29
Up to secondary	3,062	42.36	6,701	40.14	9,763	40.81
Higher	1,005	13.9	1,318	7.9	2,323	9.71
Religion						
Islam	8,791	89.11	22,053	88.61	30,844	88.75
Hinduism	1,018	10.32	2,223	8.93	3,241	9.33
Buddhism	35	0.35	509	2.05	544	1.57
Christianity	19	0.19	71	0.29	90	0.26
Other	2	0.02	31	0.12	33	0.09
Marital Status (n=30,724)						
Currently married	5,311	60.6	13,104	59.67	18,415	59.94
Never married	2,989	34.11	7,703	35.08	10,692	34.8
Widowed	383	4.37	981	4.47	1,364	4.44
Other	81	0.92	172	0.78	253	0.82
Earners (n=32,723)						
Yes	3,290	35.52	7,756	33.06	11,046	33.76
No	5,972	64.48	15,705	66.94	21,677	66.24
Income quintiles (N, SD)						
Poorer	3,752	1817	3,403	1,914	3,491	1,896
Poorer	7,884	859	7,768	868	7,798	867
Middle	10,746	921	10,607	910	10,649	915
Richer	14,610	1,433	14,506	1548	14,535	1,518
Richest	49,724	24,1324	47,975	173873	48,565	199,190
	Mean	\pm SD	Mean	\pm SD	Mean	\pm SD
Household monthly income, BDT	18,381	116,436	15,681	74,798	16,447	88,635
Household monthly health expenditure, BDT	1,340	4373	1,235	4,877	1,265	4,740

Table 2: Average monthly healthcare expenditure across population groups and cost burden

Indicators	Monthly income of the household, BDT (USD)		Healthcare cost of the households, BDT (USD)		Healthcare expenditure as percentage of monthly household income
	Mean	SD	Mean	SD	
Place of residence					
Urban	18,381 (216.2)	116,436 (1369.8)	1,340 (15.8)	4,373 (51.4)	7.3%
Rural	15,681 (184.5)	74,798 (880)	1,235 (14.5)	4,877 (57.4)	7.9%
<i>P-value</i>	0.011		0.063		
Income quintile					
Poorest	3,491 (41.1)	1,896 (22.3)	1,224 (14.4)	4,187 (49.3)	35%
Poorer	7,798 (91.7)	867 (10.2)	1,082 (12.7)	3,168 (37.3)	14%
Middle	10,649 (125.3)	915 (10.8)	1,055 (12.4)	2,856 (33.6)	10%
Richer	14,535 (171)	1,518 (17.9)	1,329 (15.6)	5,940 (69.9)	9%
Richest	48,565 (571.4)	19,9190 (2343.4)	1,660 (19.5)	6,597 (77.6)	3%
<i>χ² (p-value)</i>	0.000		0.000		
Total	16,447 (193.5)	88,635 (1042.8)	1,265 (14.9)	4,740 (55.8)	7.7%

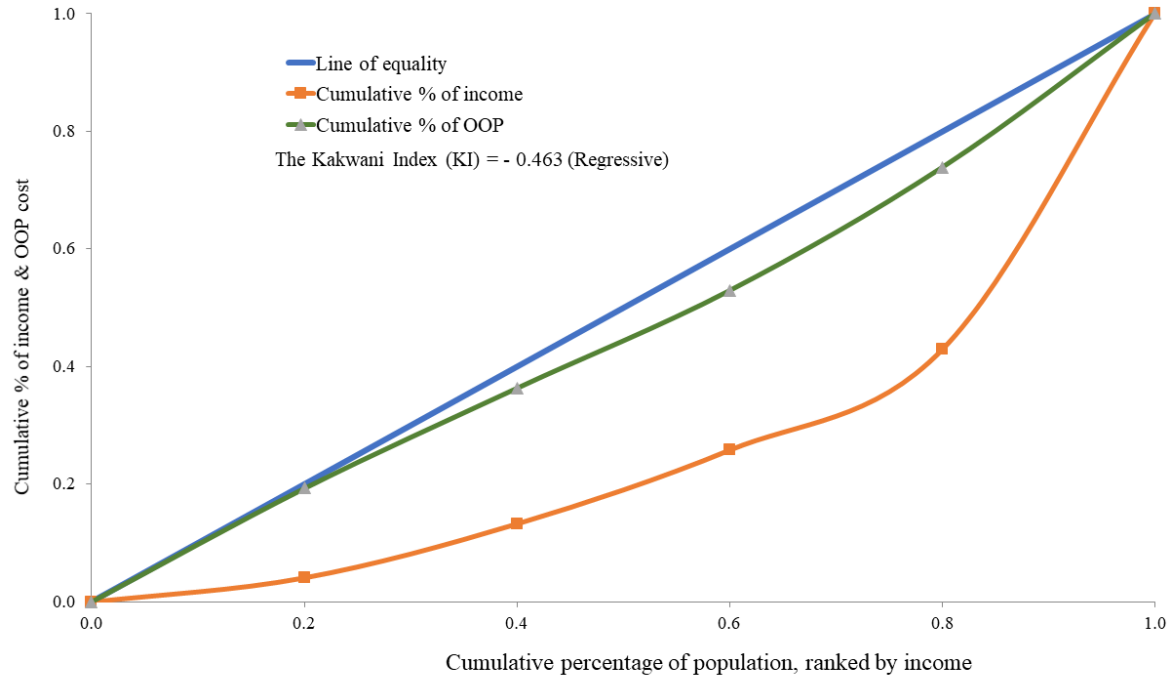
*1 USD equivalent to 85.0 BDT on mid-January 2020

Table 3: Various sources of OOP payment (%) for inpatient care across population groups

Indicators	Coping Strategies*(%)					
	Household income	Household savings	Sold/Mortgage assets	Borrowed money	Assistance from friends/relatives	Others
Place of residence						
Urban	48.5	54.8	9.8	31.1	22.8	4.5
Rural	40.7	48.7	22.5	32.8	23.3	3.5
Income quintile						
Poorest	38.6	48.6	20.8	30.9	29.2	3.9
Poorer	39.6	46.8	15.5	36.0	26.0	5.9
Middle	41.0	48.5	15.4	34.4	23.0	3.7
Richer	45.1	49.5	21.4	35.3	21.7	4.7
Richest	50.9	58.6	18.4	26.1	16.6	1.5
Total	43.2	50.7	18.3	32.2	23.2	3.8

*multiple responses considered

Figure: Concentration curves showing the socio-economic status distribution of out-of-pocket payment in relation to total household income



Accepted