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The Economic Burden of Rotavirus Hospitalization among Children <5 Years of Age in Selected Hospitals in Bangladesh

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Abstract

Background: Rotavirus is a common cause of severe acute gastroenteritis among young children. Estimation of the economic burden would provide informed decision about vaccine investment, which has been a potential policy discussion in Bangladesh for several years.

Methods: We estimated the societal costs of children <5 years for hospitalization from rotavirus gastroenteritis (RVGE) and incidences of catastrophic health expenditure. A total of 360 children with stool specimens positive for rotavirus were included in this study from 6 tertiary hospitals (3 public and 3 private).

Results: The total societal per-patient costs to treat RVGE in the public hospital were 126 USD (95% CI: 116–136) and total household costs were 161 USD (95% CI: 145–177) in private facilities. Direct costs constituted 38.1% of total household costs. The household spending for

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Conflicts of interest disclosure
The authors have no conflict of interests to declare that could inappropriately influence this study.
Sayem Ahmed: Dr. Ahmed has nothing to disclose.
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RVGE hospitalization was 23% of monthly income and 76% of households faced catastrophic healthcare expenditures due to this expense. The estimated total annual household treatment cost for the country was 10 million USD.

Conclusions: A substantial economic burden of RVGE in Bangladesh was observed as the cost of illness and catastrophic health expenditure. Any prevention of RVGE through cost-effective vaccination or/and behavioural change would contribute to substantial economic benefits to Bangladesh.

Keywords

Economic burden; rotavirus gastroenteritis; diarrhea; costs-of-illness; catastrophic health expenditure; Bangladesh

INTRODUCTION

Rotavirus is a common cause of severe gastroenteritis among children under 5 years worldwide and is estimated to cause 215,000 deaths, 24 million outpatient visits and 2.4 million hospitalizations each year [1–3]. A study in Matlab Hospital in rural Bangladesh from 2000 to 2006 found that rotavirus gastroenteritis (RVGE) was responsible for 33% of acute gastroenteritis hospitalizations among young children [4], indicating that rotavirus infection was an important cause of childhood diarrhoea in Bangladesh. A recent multicenter, multi-year study with sites throughout Bangladesh showed that, on average, 64% of children who were hospitalized with acute gastroenteritis had evidence of rotavirus infection [5].

To reduce the burden of RVGE, the government of Bangladesh plans to introduce a rotavirus vaccine into its routine immunization programme. Decisions on adopting national vaccination programs depend on multiple factors, including the health burden and economic burden associated with the targeted disease [6]. We conducted a study of the economic burden of RVGE hospitalization in conjunction with an ongoing hospital-based surveillance program for rotavirus among children hospitalized for acute gastroenteritis due to rotavirus in Bangladesh. Our goal was to complement disease burden estimates to inform decision-makers regarding the introduction of rotavirus vaccine nationally. These cost estimates will be useful for cost-effectiveness models to determine the price of an intervention that prevents RVGE and will help policy-makers to understand how the healthcare budget is spent, where to invest and what the expected returns on investment might be [7]. The overall objective of the study was to estimate the economic burden of RVGE hospitalizations among children aged less than 5 years in Bangladesh from the societal perspective.

METHODS

Study settings and subjects

To better understand the RVGE-associated health burden (mortality and morbidity) the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) in collaboration with the Bangladesh Institute of Epidemiology, Disease Control and Research, and with technical assistance from US Centers for Disease Control and Prevention, started hospital-

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based rotavirus surveillance in 2012 [5]. Hospitals from the public, non-governmental organizations (NGOs) and private were included in the surveillance program. Study patients were identified and included initially from 7 participating tertiary hospitals (4 public and 3 private) located in seven different administrative divisions of Bangladesh (see Supplementary Figure 1), however, one hospital was later dropped due to lower number of AGE cases. In the surveillance program, trained field assistants identified children aged less than 5 years admitted with acute gastroenteritis. Acute gastroenteritis (AGE) was defined as (≥3 watery or looser-than-normal stools or ≥1 episode of forceful vomiting). Field assistants collected a stool sample of 4 ml for laboratory testing. RVGE was later confirmed by testing stool samples using a commercial enzyme immunoassay [5]. The confirmation of RVGE took at least one month, and delay in receipt of test results could lead to recall bias when asking families about the costs incurred. To mitigate this problem, we collected cost data for all enrolled children in the surveillance from October 2014 to February 2015 and included only confirmed RVGE cases in the analysis.

Sample Size

To estimate the entire cost of an RVGE hospitalization, we collected data on costs borne by households and hospitals. To estimate these costs, we needed information on costs per patient and the number of patients treated for RVGE annually in Bangladesh. Since the central limit theorem suggests that at least 30 cases are required for calculation of mean with an assumption of normal distribution [8], we required at least 30×6=180 RVGE patients from the 6 facilities. Further, the experience from the previous study conducted in Matlab showed that 33% of patients with acute gastroenteritis had rotavirus and we, therefore, planned to enrol at least 91 case-patients from each facility so that we would ultimately have at least 30 patients enrolled with rotavirus infection from each facility [4]. A total of 91×6=546 children were thus targeted to enrol in this study.

Cost estimation

Household costs of RVGE hospitalization—We captured all costs related to RVGE episodes prior to and during hospitalizations and after discharge. Trained data collectors administered a structured questionnaire to capture household costs by face-to-face interview at the time of discharge from the hospital. They called families one week after discharge to ascertain the costs that may have been incurred during the week. During these interviews, all direct and indirect costs related to RVGE treatment were collected. If patients sought care at more than one healthcare facility, all of those costs were captured in this study. Household costs of RVGE included both out-of-pocket payments (direct costs) made by the households for the management of the disease and the opportunity costs (indirect costs) for caregivers' time during disease episodes [9,10]. We collected household expenditure information from the patient's caregiver who either took care of the financial expenditures or stayed the longest time with the patient, usually a parent or other close family member. The respondents were requested to contact other household members to collect relevant cost information, as needed.

Direct costs were defined as out-of-pocket expenditures for treatment by households which consisted of *direct medical* and *direct non-medical* costs components [9]. Direct medical

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costs included healthcare resources consumed during the disease episode, such as patient treatment costs. These costs were estimated by multiplying amounts of health services used (e.g., number of consultations) with unit costs (e.g., costs for each consultation) for obtaining each service. Direct non-medical costs included transportation, lodging for caregivers, food items, informal payments and amounts of subsidies for materials used (e.g., mugs, jars, plates and glasses). We included costs for these non-medical materials since these are often purchased for use during hospital stays or lodging.

Indirect costs reflect the estimated value of all unpaid time devoted to caregiving by accompanying persons. Caregiving time is included based on the assumption that time devoted to this may represent other forgone opportunities (e.g., leisure time or household work). These opportunity costs were estimated using the human capital approach [11] which measures the loss of production, like earnings loss of patients and/or caregivers including the value for household work [7,12]. These costs of caregivers were estimated using the information on their monthly salaries and time involved in caregiving during illnesses. For unpaid home workers or housewives, we used half of the average income for estimating their indirect costs [9,13]. The opportunity costs were estimated only for caregivers in this study since the patients were children under five years.

The average total household costs per patient were estimated by summing all direct and indirect costs to each household for treatment of each patient and dividing by the number of patients enrolled. Per patient costs of RVGE were presented by disaggregating into cost components (e.g., consultation fees, drug costs, food costs and transportation) to identify major cost drivers which are the items that consume a large share of the total cost. We stratified the estimates by socio-demographic characteristics (e.g., age of patients, household income quintiles) and types of healthcare facility utilized to identify the concentration of costs across these groups and performed appropriate statistical tests (e.g. t-test, one-way analysis of variance test) to understand the significance of the difference.

Healthcare facility costs—Healthcare facility costs for treating children with RVGE were calculated as costs of resources spent by the facility less any fees received from patients [14]. The costs for the required resources were classified into recurrent and capital costs [15]. Recurrent costs are the value of the resources that are regularly purchased and directly or indirectly used for providing the services [16]. Human resources, drugs, equipment and consumables are examples of recurrent cost items included in this study. Shared recurrent cost items are used in the production of many outputs and therefore cannot be directly associated with one specific output. Examples include office equipment and utility bills [14]. Items which were purchased at one point in time and used over time (more than 1 year) were defined as capital items [17]. Major capital items are buildings, vehicles, medical equipment, pre-service training, computers, and other equipment. For capital items, annuitization was done considering the discounting rate of 5% and their useful life year [17].

A semi-structured questionnaire, record reviews and key informant interviews of top administrative management and clinical staff were conducted to estimate the costs borne by the health facilities. We only investigated costs of treatment in public facilities which are commonly shared by households and health facilities. In private healthcare facilities, the

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households of the patients alone bear the health services costs since treatment costs as well as profits are assumed to be included in the costs of care in private for-profit facilities. We, therefore, estimated the treatment costs in private facilities obtained by the costs-of-illness to households only and not the costs to the health facilities. The following framework presents how the economic burden of RVGE hospitalization was captured in this study.

Hospital cost data were collected from relevant personnel in management (central level, pediatric departments and diarrhea wards); e.g., from hospital accountants, storekeepers, hospital statisticians, pathology laboratories, in charge nurses and duty doctors of pediatric department/diarrhea wards using a semi-structured questionnaire. For allocating the costs of shared recurrent items (e.g., electricity bills, facility rents), the number of patient-days was used. For example, the electricity bill for one year was divided by the number of all patient-days in the hospital to estimate the cost associated with one-day inpatient stay. This cost was then multiplied by the average length of stay for RVGE treatment to estimate the electricity bill cost per RVGE patient. By summing up direct and indirect recurrent costs, total recurrent costs of health facility were estimated.

The cost of the total floor space of the study ward was estimated using the government rate per square foot of floor space. This cost was annualized to calculate the annual equivalent cost considering the functional life-years of the buildings as 30 years with a discount rate of 5% [18]. We added mean household costs and public health facility costs to obtain the cost per patient in a public facility. For private facilities, the average household cost was used as the cost-per-patient estimate. Finally, the economic burden, i.e., costs per patient, were estimated by performing a weighted average of costs per patient for public and private facilities.

Total economic burden of RVGE—For estimating the economic burden of RVGE nationwide, the percentage of RVGE hospitalizations among under 5 children with acute gastroenteritis was collected from the Hospital-Based Rotavirus and Intussusception Surveillance [5]. The total annual number of acute gastroenteritis hospitalization of the children at public facilities were obtained from Health Bulletin 2014 [19]. Since there were no records available for annual numbers of acute gastroenteritis cases in private facilities, we estimated this using prevalence of acute gastroenteritis in children and the proportion of such patients utilizing hospitalization care in private facilities. To obtain the total number of RVGE cases in private facilities, we multiplied annual numbers of acute gastroenteritis hospitalized cases in private facilities by the proportion of RVGE patients among acute gastroenteritis cases. Data on the prevalence of acute gastroenteritis and utilization of services from private facilities were extracted from the Health and Morbidity Status Survey-2012 [20] and the proportion of RVGE patients among acute gastroenteritis cases were found from surveillance [5]. Then the annual numbers of patients with RVGE in each type of facility were multiplied by the total costs per patient to estimate the annual costs incurred in public and private facilities. Finally, we added these costs to obtain the nation-wide costs for RVGE hospitalization in children under five years in Bangladesh. We presented the average cost per patient with a 95% confidence interval whenever applicable. We converted Bangladeshi Takas (BDT) to US dollars (USD) using the exchange rate of 77.72 BDT = 1 USD [21].

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The incidence of catastrophic health expenditures (CHE) was estimated from the fraction of direct household costs in relation with household incomes exceeded a certain threshold (e.g. 10% and 25% of household total income) [22–24]. We reported both 10% and 25% of total income as threshold levels for estimating the incidence of CHE, while the former one is used as an indicator of financial risk protection, defined by the United Nations' Sustainable Development Goal (target 3.8.3) and the later one shows a sensitivity analysis.

Ethical approval—We obtained written informed consent from the enrolled children's parents or guardians. The study protocol was reviewed and approved by the ethical review committee of icddr,b.

RESULTS

A total of 474 children were enrolled in this study since 30 RVGE confirmed cases were found from each facility before reaching the target number of the sample. Of these enrolled children, 360 were confirmed to have RVGE and included in this analysis. Among the confirmed RVGE cases, 178 were admitted to public hospitals and 182 to private hospitals. The average total cost of treating one episode of hospitalized RVGE was 137.9 USD (Table 1). The direct cost was 43.8 USD, representing 31.8% of the total cost. Medicine costs (11.0 USD) were the major cost drivers, comprising the largest share of all direct medical costs, followed by the costs of medical instruments (2.8 USD). Among direct non-medical costs, transportation costs (10.6 USD) constituted the largest share, followed by food costs (10.0 USD). Indirect costs were 94.1 USD per episode of hospitalized RVGE, which represented 68.2% of the total costs.

The highest expenditure was observed for children aged 6–11 months followed by 12–24 months (Table 2). The average total costs for male and female children were similar (139 vs 136 USD) and not significantly different (P= 0.713). A gradual increase in average total costs was observed as the income quintiles of the households increased (P <0.000). The household costs per RVGE episode were 105.2 USD in the poorest quintile and 164.3 USD in the richest quintile. Households spent on an average 114.2 USD to treat an RVGE case in public and 161.1 USD in private healthcare facilities. Both the average direct and indirect costs of the households were higher in private facilities compared to public facilities (P <0.000).

In public facilities, the average costs borne by the facility to treat a child for RVGE was 11.52 USD (Table 3). Of the average facility costs per patient, 8.3 USD and 3.3 USD were the costs of recurrent items and capital items, respectively. The highest recurrent costs per patient for the facility was food costs (4.02 USD), followed by the staff salaries (2.93 USD). Shared capital items (ambulances, generators, elevators) accounted for the highest health facility costs (2.03 USD) per patient.

For RVGE-associated hospitalization for children less than 5 years, the average societal costs per patient were 125.7 USD in public facilities and 161.1 USD in private facilities (Table 4). The average health facility costs to treat RVGE were 11.5 USD in public hospitals. However, household costs were 114.2 USD and 161.1 USD for public and private

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facilities, respectively. The weighted mean cost of RVGE treatment for the public and the private facility was 143.6 USD.

The overall annual costs for RVGE hospitalization for children less than 5 years of age in Bangladesh was 10.4 million USD (Table 5). Of the total annual costs for RVGE, 26.1% was for treatment in public and 73.9% for treatment in private facilities. A total 69,017 children hospitalized annually for RVGE, of which the highest number of children (47,508) received treatment in private facilities.

The incidence of CHE using 10% and 25% of the total monthly household income as threshold levels presented in Table 6. Overall, 75.6% of the households observed CHE due to RVGE treatment costs when CHE threshold was set as a cost of 10% of total monthly income. When the threshold was set at 25%, the proportion of households with CHE declined to 33.9%. We observed that the CHE were more concentrated in households in lower-income quintiles ($P<0.000$) using both threshold levels.

DISCUSSION

This analysis allowed us to connect the economic burden to national and global policy issues particularly the prevention of rotavirus infection and its economic outcomes in terms of securing financial risk protection for achieving universal health coverage in Bangladesh. The discussion concerning introducing rotavirus vaccine in Bangladesh has been ongoing for several years among numerous stakeholders, including the government of Bangladesh and GAVI the vaccine alliance as well as the research community[25]. However, the economic aspect of rotavirus gastroenteritis has not been studied adequately. Our current study could be used to gain a better understanding of how RVGE prevention would bring health and economic benefits to society. A trail of a Human Rotavirus Vaccine (HRV) among children under 2 years in a rural area of Bangladesh showed a downward trend in RV+ diarrheal incidences in a rural area during 3.5 years of routine HRV use [26]. Even a behaviour change intervention which included oral rehydration solution (ORS) and zinc, promotion of breastfeeding, handwashing and sanitary latrines (WASH), as well as improvements in female education and nutrition, demonstrated aversion of deaths due to diarrhea [27]. Another study observed that water quality, sanitation, handwashing, and nutritional interventions had reduced diarrhoea incidences [28]. Based on our cost analysis, we found that prevention of an RVGE hospitalization incidence, irrespective of the methods of prevention would save 143.6 USD. The out-of-pocket spending constituted 22.8% of their monthly income and 75.6% of these households faced CHE. The proportion of CHE were higher among poorer households. It implies that the RVGE hospitalization cases resulted in financial risk for a large share of the households. By preventing RVGE cases financial risk protection can be secured for many households (SDG target 3.8.2) and consequently, can contribute to achieving universal health coverage. Further, the disaggregation of the total societal costs showed that the income loss of the caregivers constituted 68.2%. The GDP per household (4.5 member per household) of Bangladesh was 5,035 USD in 2014. It means that the prevention of one RVGE case would save 1.9% of GDP per household over a one-year period.

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Of all input factors for RVGE hospitalization, medicine absorbed the largest share, followed by staff time. The costs of drugs, which constituted the largest share of all inputs at the national estimation by the Bangladesh National Health Accounts [29], appeared to be remarkably low in public hospitals in this study. It could be explained by the short supply of medicines in public facilities [30]. However, of the total direct medical costs, medicines consumed two-third of the total household out-of-pocket payments, which is very close to the national estimation[29] We, therefore, believe that our findings generally captured the pattern of distribution of health expenditures across input factors.

RVGE incidence used in this study was based on limited numbers of hospitals, which might not be broadly representative of hospitals in the country. However, these selected hospitals covered the regional variation in the country. It should be also noted here that we estimated the public facility cost for the current facility only. It was not possible to capture the costs of other public facilities (e.g. primary or secondary level facilities) if any patients sought care prior to the current facility for the same episode. This might result in underreporting of the public facility costs. However, the household costs of such patients in the prior facilities were collected retrospectively.

The higher average costs of RVGE-associated hospitalizations in private facilities and the high share of out-of-pocket payments in the public facilities in Bangladesh demonstrate the economic hardship of the people. Further, we observed a strong socioeconomic gradient with higher direct medical costs for higher-income households. However, no difference in costs was found between males and females. The socioeconomic pattern of costs of health services, i.e. higher costs among the richer households, was even observed in the health system of Bangladesh and such inequity was largely explained by the private health service provisions in the country [31]. It was observed that more households in lower-income brackets faced a higher incidence of CHE. It implies that RVGE treatment can lead to economic impoverishment in many low-income households. Out-of-pocket payments for healthcare is the predominant method for financing healthcare in general (63% of total health expenditure [29]) and care for RVGE treatment in Bangladesh. This means that prevention of RVGE will benefit the people from all socioeconomic groups since they spent mainly as out-of-pocket payments. While 14.2% households face CHE and 3.5% of total population (5 million people) fall into poverty every year in Bangladesh due to paying for any kind of healthcare (public or private) [32], prevention of rotavirus infections should be able to save some households from economic impoverishment annually. This study demonstrates that preventing RVGE will result in substantial economic benefits to the households and public facilities in terms of foregone cost-of-illness due to averted cases. In addition, prevention can reduce CHE of many households in Bangladesh, particularly lower-income households.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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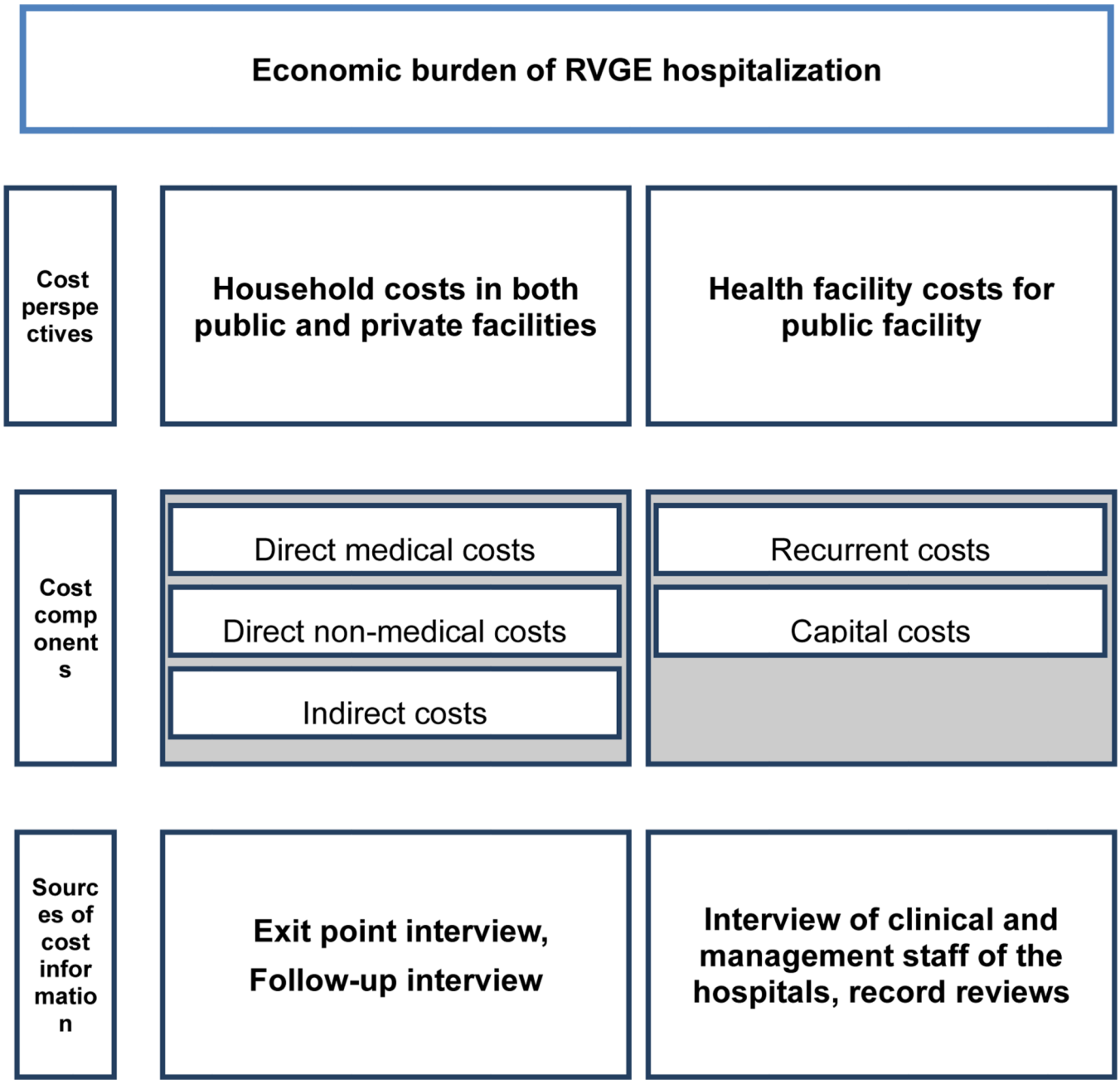

Figure 1.
Framework for estimating economic burden of rotavirus gastroenteritis hospitalization

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Table 1.

Household costs (USD) for children less than 5 years due to hospitalization for rotavirus gastroenteritis in Bangladesh

Costs component	Costs items		Average costs (USD)	95% CI	% of total costs
Direct Costs	Medical	Consultation fees	1.1	(0.9-1.3)	***31.8***
		Medicine	11.0	(10–11.9)	
		Diagnostic test charges	1.6	(0.6-2.7)	
		Medical instrument	2.8	(2.5-3.1)	
	Non-medical	Transportation	10.6	(9.5-11.6)	
		Registration fees	1.2	(1.1-1.3)	
		Rent for bed, cabin	4.3	(3.6-5.1)	
		Food items	10.0	(9.1-11)	
		Materials	1.0	(0.8-1.2)	
		Others (e.g. hotel costs of attendant, tips)	0.2	(0.1-0.3)	
Total direct costs			***43.8***	***(40.7-47)***	
Total indirect costs			***94.1***	***(86.3-101.8)***	***68.2%***
Total costs			**137.9**	**(128.3-147.6)**	**100.0%**

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Table 2.

Household costs (USD) for children less than 5 years due to hospitalization for rotavirus gastroenteritis in Bangladesh

Characteristics	Direct costs Mean (95% CI)	P-value	Indirect costs Mean (95% CI)	P-value	Total costs Mean (95% CI)	P-value
Age group (months)						
0-5	30.6 (22.5-38.7)	0.069[a]	80.6 (67.5-93.7)	0.527 [a]	111.2 (94.1-128.2)	0.255 [a]
6-11	46.3 (40.7-52)		100 (85.5-114.6)		146.4 (128.6-164.2)	
12-24	44.9 (40.3-49.6)		92.6 (81.1-104)		137.5 (123.2-151.9)	
24+	38.6 (31.6-45.7)		86.1 (75.3-96.9)		124.8 (110.1-139.4)	
Sex of the child						
Male	44.3 (40.7-48)	0.713[b]	95.1 (83.7-106.4)	0.759 [b]	139.4 (125.9-152.9)	0.713 [b]
Female	43.1 (37.3-48.9)		92.6 (83.4-101.8)		135.6 (122.6-148.7)	
Income groups (monthly) of households in USD						
1 (< 115.8)	28 (23.8-32.3)	0.000 [a]	77.2 (68.1-86.2)	0.058 [a]	105.2 (94-116.5)	0.000 [a]
2 (115.8 – 167.3)	36.5 (30.5-42.4)		90.5 (80.8-100.2)		127 (113.3-140.6)	
3 (167.3 – 244.5)	47.9 (38.5-57.4)		89.8 (78-101.6)		137.7 (118.5-156.9)	
4 (244.5 – 347.4)	49 (41.9-56)		108.8 (83.9-133.8)		157.8 (129-186.7)	
5 (>347.4)	59.2 (52-66.4)		105.1 (82.5-127.8)		164.3 (137.4-191.3)	
Types of healthcare providers						
Public	26.4 (22.6-30.1)	0.000 [b]	87.8 (80.4-95.3)	0.118 [b]	114.2 (104.1-124.3)	0.000 [b]
Private	60.9 (57.2-64.6)		100.2 (86.7-113.6)		161.1 (145.4-176.7)	
Total	**43.8 (40.7-47)**		**94.1 (86.3-101.8)**		**137.9 (128.3-147.6)**	

[a] One waa ANOVA

[b] t-test

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Table 3:

Costs of public health facilities (USD) to treat one child aged <5 years hospitalized for rotavirus gastroenteritis in Bangladesh

Cost items	Average annual costs	Average costs per patient
Recurrent costs items		
Electricity bills	145,941	0.57
Telephone bills	766	0.01
Transport bills	12,059	0.19
Food costs	32,625	4.02
Medicine costs	23,106	0.16
Costs for Diagnostic tests	186	0.05
Disposable items	2,332	0.32
Diarrhoea ward staff	25,846	2.93
Laboratory staff	1,882	0.01
Recurrent supplies	1,823	0.01
Capital costs items		
Shared capital items (ambulances, generators, elevators, air conditioners)	948,338	2.03
Capital items diarrheal ward (beds, rubber sheets, ceiling fans)	11,779	1.03
Floor space	643	0.19
Total number of patients per facility		**4,423**
Total number of diarrheal patients per facility		**101**
Total facility costs per patient		**11.52**

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Table 4.

Total societal costs per patient (USD) of rotavirus gastroenteritis hospitalization among children less than 5 years age in Bangladesh

Costs perspectives	Public facilities		Private facilities	
	N	Mean (95% CI)	N	Mean (95% CI)
Household	178	114.2 (104.1–124.3)	182	161.1 (145.4–176.7)
Health facility	3	11.5 (3.3–19.7)	-	-
Societal		**125.7 (115.7–135.8)**		**161.1 (145.4–176.7)**
Weighted average of societal cost		**143.6**		

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Table 5.

Total annual costs (USD) for rotavirus gastroenteritis hospitalization among children less than 5 years age in Bangladesh

Type of health facility	Total annual utilization of hospitalization	Costs per case	Total costs (in million USD)	Percentage
Public facilities	21,509 *	125.7	2.8	26.1%
Private facilities	47,508 **	161.1	7.6	73.9%
Total	**69,017**		**10.4**	**100%**

Notes:

* Helath Bulletin-2014 [19],

** Author calculation using Health Bulleting-2014 and Health and Morbidity Status Survey-2012 [20]

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Table 6.

Incidence of catastrophic health expenditure (CHE) due to rotavirus hospitalization

Income quintile	Direct cost as percentage of monthly income	P-value	Percentage of household spending more than 10% of their income in treatment	P-value	Percentage of household spending more than 25% of their income in treatment	P-value
1st (< 115.8)	31.8 (26.5-37.0)	0.000[a]	86.7 (79.4-94.1)	0.000[b]	48.2 (37.3-59.0)	0.000[b]
2nd (115.8 – 167.3)	26.3 (21.9-30.7)		86.2 (77.7-94.6)		38.5 (26.5-50.4)	
3rd (167.3 – 244.5)	25.3 (20.3-30.2)		76.7 (65.8-87.5)		45.0 (32.3-57.7)	
4th (244.5 – 347.4)	18.0 (15.5-20.5)		71.4 (61.2-81.6)		24.7 (14.9-34.4)	
5th (>347.4)	11.6 (10.1-13.0)		52.2 (40.1-64.3)		4.5 (-0.5-9.5)	
Total	22.8 (20.8-24.7)		75.6 (71.1-80.0)		33.9 (29.0-38.8)	

a) Kruskal-Wallis rank test;

b) Chi-square test