Disability and Intrahousehold Investment Decisions in Education: Empirical Evidence from Bangladesh

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Investment disparity in the education of persons with disabilities may be larger on the part of parents, in part resulting from predicted lower returns to the investment due to mistaken beliefs about their capabilities, or actual lower returns due to barriers in the labor market. Using a nationally representative dataset from Bangladesh and utilizing the framework of the Engel curve, we investigate intrahousehold investment decisions in education between children with and without disabilities. The results of the hurdle model show the existence of disability bias in enrollment decisions, whereas individual-level analysis suggests that bias exists on educational expenditure after children with disabilities enroll in school. Additionally, though we observe a lower level of bargaining power among household heads on educational investments for their children with disabilities, interaction effects suggest the importance of greater income stability and maternal education status being instrumental to improving the education of persons with disabilities.

Keywords: Bangladesh, disability bias, Engel curve, hurdle model, investment in education

JEL codes: I2, E2, O1

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I. Introduction

Studies have shown the effect of household and individual factors such as parental education, family size, and the gender of the child on educational investment for children (Kingdon 2002, Sawada and Lokshin 2009). Similarly, there is ample evidence regarding gender disparities in intrahousehold resource allocation (Subramanian and Deaton 1991; Subramanian 1995; Deaton 1997; Burgess and Zhuang 2000; Lancaster, Maitra, and Ray 2003; Kingdon 2005; Aslam and Kingdon 2008; Lancaster, Maitra, and Ray 2008; Himaz 2010; Masterson 2012; Azam and Kingdon 2013).

On the other hand, why school enrollment and educational attainment of persons with disabilities (PWDs) are lower than those of non-PWDs is still a matter of intense debate. Several studies have discussed discriminatory attitudes, parents' financial constraints, and institutional barriers as some of the plausible reasons for the lower level of schooling of PWDs (Lamichhane 2013, 2015; Lamichhane and Kawakatsu 2015; Takeda and Lamichhane 2018). Despite growing attention regarding the social inclusion and economic empowerment of PWDs in recent years, to the best of our knowledge, except for a study by Rosales-Rueda (2014) on children with mental health conditions in the United States, there are no studies that examine the relationship between children's disability and household investment decisions for education. The lack of rigorous studies on this topic and the importance of providing evidence-based policy implications on the education of PWDs is the main motivation for this study. Given the fact that there is dearth of specific data on disability and intrahousehold resource allocation in education in Bangladesh, our study has the potential to be a powerful planning tool for policy makers.

Investment disparity in the education of PWDs may be largely due to parents, as in many countries discrimination toward PWDs is widespread. Consequently, household financial constraints, combined with discriminatory attitudes on the part of parents, may negatively affect their decision to invest in education of PWDs, in part resulting from the predicted lower returns to education of PWDs due to mistaken beliefs about their capabilities, or actual lower returns due to barriers in the labor market. Thus, the education of PWDs may be partly driven by shifts in parental investment strategies that may give priority to their nondisabled children. Therefore, utilizing a large and nationally representative Household Income Expenditure Survey (HIES) dataset from 2010 of a developing economy, Bangladesh, we aim to detect the biases against children's education caused by disability status in the process of intrahousehold investment decisions.

According to Lamichhane and Kawakatsu (2015), the education system in Bangladesh comprises 3 years of preprimary, 5 years of compulsory primary, 3 years of junior secondary, 2 years of secondary, and 2 years of higher secondary education. Education is only compulsory at the primary level and is free up to that level, with girls continuing to receive free education up to the secondary level (Lamichhane 2015). Bangladesh has initiated policies such as the National Education Policy, 2010 and a series of Primary Education Development Programs (e.g., PEDP II and III) to meet its constitutional obligations to provide a uniform, mass-oriented, and universal system of education as well as its international commitments to educating all school-aged children within the mainstream education system. A study by Ahmmed, Sharma, and Deppeler (2012) discussed teachers' perceptions of school support for implementing inclusive education. While inclusive education is still gaining momentum in Bangladesh, disability issues have been recognized in the country's midterm development plans, gradually placing policy attention on critical issues of education.

As one of the world's least developed countries per United Nations classification (World Bank 2021), Bangladesh is characterized by little or no access to social benefits and little implementation on the ground to ensure that vulnerable people, including individuals with disabilities, get what they are promised. The study of Chowdhury and Foley (2006) shows how persons with disabilities in rural Bangladesh can slide into economic impoverishment once they are labeled as such due to the various deprivations that their impairments expose them to. Bangladesh developed a national policy in 1995 emphasizing the provision of services for PWDs. It also enacted the comprehensive disability law known as the Disability Welfare Act in April 2001, which aimed to protect the rights of PWDs. Additionally, Bangladesh ratified the Convention on the Rights of Persons with Disabilities in November 2007 and ratified the optional protocol in May 2008. In 2013, a new Disability Act in line with the convention was enacted. Despite such legal accomplishments, the increased participation of PWDs in educational, social, and economic sectors is still critical (Lamichhane 2015).

Additionally, Lamichhane and Kawakatsu (2015) examined the determinants of school participation between children with and without disabilities in Bangladesh and found that those with disabilities are less likely to participate in school. However, once the sample is restricted to those with disabilities only, their study shows that household monthly expenditure and working-age members are positively correlated with the probability of school participation. If PWDs are deprived of education, this will hurt their quality of life. For example, Lamichhane and Sawada (2013) found that in Nepal wage returns to the investment in education of PWDs were between 19.2% and 25.6%,

which is two or three times higher than estimates for the general population (Psacharopoulos and Patrinos 2004). While studies on disability and education in Bangladesh are rare, with this paper we aim to at least partially fill the gap in existing knowledge by examining the existence of disability bias and related factors associated with parental decisions on educational investments. By doing so, we intend to help identify constraints preventing PWDs from enjoying the multifaceted benefits of education. The research questions posed herein are as follows: Does disability bias exist in intrahousehold investment in education? If so, where does such bias exist, in the stage of enrollment or thereafter? What are the key factors affecting parental investment decisions with regard to the education of children with disabilities (CWDs)? Although there is a serious lack of scientific and evidence-based information on disabilities, Bangladesh provides a good setting for studying parental decisions on intrahousehold resource allocation in education due to the availability of nationally representative data.

II. Dataset from Bangladesh

We use the large-scale and nationally representative 2010 HIES dataset published by the Bangladesh Bureau of Statistics. This dataset includes a wide variety of information on the country's socioeconomic situation—including demographic characteristics, educational attainment, employment status, and access to facilities, among others—and consists of more than 12,000 households: 20 each from 612 primary sampling units. Out of the total sample of 55,580 household members, there are 16,696 school-aged children (6–18 years old) who are supposed to attend school in Bangladesh.

Additionally, the survey identifies people's disability status based on a short set of questions recommended by the Washington Group on Disability Statistics (2020). The questions focus on the difficulties people face in seeing, hearing, walking, cognition, self-care, and communication according to a four-point scale: (1) no difficulty, (2) some difficulty, (3) a lot of difficulty, and (4) cannot do. From these questions, we obtain information on the type and severity of activity limitations. Having some difficulty is considered to be a moderate limitation, whereas a lot of difficulty and cannot see, hear, speak, walk, and so on are considered to be severe limitations. The inclusion of the Washington Group on Disability Statistics' questions is also helpful for the international comparability of the situation regarding disability. In the 2010 HIES, disability modules were asked under section three (health),

subsection (d). Together with 18 questions, including the question on onset of impairment, two additional questions on any difficulty caused by disability at home, in the workplace, or at school were included in the 2010 HIES. Sadly, the 2016 HIES included only six questions about participants' impairment as part of a household information roster, excluding all other questions such as onset of impairment and any difficulty caused by disability at home, work, and school. The exclusion of disability modules in the 2016 HIES dataset led us to believe that the 2010 HIES was more comprehensive in relation to the information on disability. For this reason, 2010 HIES data have been used in this study.

III. Empirical Strategy and Related Literature

We investigate the existence of disability bias by examining the discriminatory allocation of educational expenditure within households. We use the Engel curve framework, which has been used in numerous previous studies to detect gender bias in intrahousehold resource allocation. It is equally important to detect disability bias through the Engel curve framework, which seeks differential treatment within households indirectly. Such bias can be identified by examining how the household composition of people with and without disabilities affects household expenditure on education. To detect these biases, we use both an indirect and direct method. The indirect method, known as household-level analysis, is based on conventional Engel curve methodology, while the direct method refers to individual-level analysis that uses individual-child-level data.

A. Household-Level Analysis

We follow Subramanian and Deaton (1991) and Deaton (1997) and employ the Working and Leser specification, extended by adding household demographic composition to Working's Engel curve (Working 1943). To estimate the Engel curve, the equation is also relaxed for nonlinearity of the log of per capita expenditure along with the shape of the Engel curve

$$s_i = \alpha + \beta \ln\left(\frac{x_i}{n_i}\right) + \gamma \ln(n_i) + \sum_{k=1}^{K-1} \theta_k \frac{n_{ki}}{n_i} + \pi z_i + \varepsilon_i, \tag{1}$$

where s_i is the budget share of total educational expenditure of ith household; x_i is the total expenditure of that household; n_i is the number of members (i.e., household size)

of the ith household; n_{ki} is the number of household members in the kth disability-age cohort where $k = 1, 2, \ldots, K$; z_i is a vector of other household characteristics (i.e., information on household head, religion, and dependency ratio) that are incorporated as controls; and ε_i is the error term. Accordingly, $\ln(x_i/n_i)$ is the natural log of total per capita expenditure of the ith household. When detecting bias, we elaborate disability-age category variables, which are divided into 14 categorical groups for PWDs and non-PWDs following Kingdon (2005): 0–4 years, 5–9 years, 10–14 years, 15–19 years, 20–24 years, 25–60 years, and over 60 years. The variable for over 60 years old is omitted as this is the base observation against the results of variables for other groups. Using these disability-age categories, n_{ki}/n_i is the share of the kth disability-age fraction and the value of coefficient θ_k is the effect of household composition by disability-age category on the budget allocation with the difference in the household size of each household being considered. As our main objective is to identify disability bias, we test the difference of the marginal effect (DME) of the disability-age category variable (difference among the same age category) only for variables along with school age, and the following null hypothesis is tested for each school age (i.e., children aged 5–9, 10–14, and 15–19 years old):

$$\theta_{k\text{CWD}} = \theta_{kn\text{CWD}}, \tag{2}$$

where CWD is a child with disabilities and nCWD is a child without disabilities. k refers to a given age category within school age roughly in line with the Bangladeshi education system from ages 5 to 19 years old (5–9 = primary education, 10–14 = junior secondary and secondary education, 15–19 = higher secondary and higher education).

Additionally, as a strategy to identify disability bias, we employ the hurdle model (Cragg 1971, Cameron and Trivedi 2005, Wooldridge 2010), which has also been used to examine gender bias (Kingdon 2005, Aslam and Kingdon 2008, Himaz 2010, Azam and Kingdon 2013).[1] While the Engel curve model (equation [1]) has been estimated using ordinary least squares (OLS) and including all households regardless of children's enrollment status, Kingdon (2005) highlighted the failure of such conventional research and proposed that there should be two possible channels through which pro-male bias is observed in expenditure: (i) via zero purchases for daughters and positive purchases for sons, and (ii) conditional on positive purchases for both daughters and sons via lower expenditure on daughters than on sons. More succinctly, bias against girls must exist in two types of decision-making patterns by

[1]The hurdle model is also referred to as a two-part model and is primarily applied by Duan et al. (1983) for forecasting medical expenses (Cameron and Trivedi 2005, Wooldridge 2010).

parents—that is, whether to enroll their children (zero-versus-positive spending decision) and how much to pay for their education on the condition that a child is already in school (spending conditioned on enrollment decision). The Engel curve method with conventional OLS neglects the first part of decision-making (neglect zero expenditure) and this leads to the downward bias of estimation results.[2]

The hurdle model detects bias efficiently under censoring and two types of decision-making. The simple hurdle model is as follows:

$$P(s = 0|x) = 1 - \Phi(x\gamma), \tag{3}$$

$$\ln(s)|(x, s > 0) \sim \text{Normal}(x\beta, \sigma^2), \tag{4}$$

where s is the budget share of educational expenditure in total household expenditure, x is a vector of other explanatory variables, and γ and β are parameters to be estimated. Once we obtain the results of the maximum likelihood estimation of the probit model (binary choice of whether $s > 0$) and OLS conditional on nonzero expenditure ($s > 0$) using the hurdle model results, we calculate the combined marginal effect (CME), which shows the effect of x on outcomes of both models (i.e., probability of $s > 0$ and the amount of $s|s > 0$). This CME is calculated as follows (Kingdon 2005)[3]:

$$\frac{\partial E(s|x)}{\partial x} = \{\gamma\varphi(x\gamma) + \Phi(x\gamma)\beta\} \exp\left(x\beta + \frac{\sigma^2}{2}\right). \tag{5}$$

Estimators are derived separately in each stage of the hurdle model in equations (3) and (4). $\Phi(\cdot)$ is the cumulative normal density function and $\varphi(x\gamma)$ is the standard normal density function. We apply the model to investigate the existence of disability bias between CWDs and non-CWDs within households.

Moreover, this model can solve the averaging problems of the conventional Engel model (Kingdon 2005). Additionally, educational expenditure is used in household analysis as if this were expenditure for all household members, but this is actually a more personalized cost. Specifically, while enrollment itself is lower, the educational cost for CWDs is considered to be higher than that for non-CWDs as educational materials such as textbooks in braille or providing sign language, equipment, and inaccessible infrastructure may require additional costs. Addressing these issues is crucial for CWDs.

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[2]Deaton (1997) states that a large proportion of households pay nothing for education.

[3]For more specific calculation for derivation of an equation, see Kingdon (2005).

B. Individual-Level Analysis

We also employ the direct method with individual-child-level data to check the robustness of our analysis to confirm disability-based bias, as well as to consider disability-based bias and parents' investment behaviors in detail. Here, equation (1) is slightly changed as follows:

$$p_{ij} = \alpha + \beta \ln\left(\frac{x_i}{n_i}\right) + \gamma \ln(n_i) + \theta \text{ impairment}_{ij} + \pi z_{ij} + \varepsilon_{ij}, \quad (6)$$

where p_{ij} is personal educational expenditure on the jth child in the ith household, x_i is total household expenditure, n_i is household size, impairment is a dummy variable (1 = disabled, 0 = otherwise), and z_{ij} is a vector of other child-specific (includes timing of getting disability) and household characteristics. In this individual regression, the impairment dummy captures the effect of disability bias. We use interaction terms between children's disability status and other characteristics to test whether there are heterogeneous effects of disability depending on certain characteristics. Here, disability status is interacted with a female dummy, mother's years of schooling, father's years of schooling, and employment status of the household head. These terms can reveal whether female CWDs suffer more bias relative to male CWDs, and whether parents' education and income stability alter the levels of disability bias.

Table 1 reports the results for three equations: the unconditional OLS model (D), the probit model for binary choice of school enrollment (A), and the conditional OLS model conditioned on enrollment (B). Additionally, we add a column for CME in (C). We restricted the household-level analysis to households that have children aged 5–19 years old, while individual-level analysis is conducted for each schooling level group of children (i.e., 5–9, 10–14, and 15–19 years old). Estimations for the hurdle model are calculated using the "twopm" command in Stata (Belotti et al. 2015).

While the estimation framework does not enable us to determine a clear direction of causality, we think that this allows us to pursue our objectives to determine the existence of bias itself. Additionally, the estimation can be complicated by a problem of endogeneity. Among independent variables, monthly expenditure and dependency ratio can be the index of poverty level and this may cause child impairment (impairment dummy) through malnutrition and serious illness. This may underestimate the impact of the impairment dummy variable, making it hard to identify a causal relationship between disability status and individual educational expenditure, which leads to failure to disclose disability bias. To handle this, we include household-level (family) fixed effects to consider all time-invariant heterogeneity of household

characteristics and minimize the effect of the impairment dummy. Filmer (2008) argues the effectiveness of incorporating household fixed effects to deal with endogeneity of disability status that may arise from poverty in the developing world, which is presented in the final section.[4] Additionally, a Durbin–Wu–Hausman test is unable to reject the null hypothesis that household size is exogenous. Therefore, we do not present the result of the instrumental variable regression model. To control district-level characteristics, we also incorporate district-level fixed effects for all analysis.

IV. Results and Findings

A. Descriptive Results

We observe significant differences in enrollment between CWDs and non-CWDs for both rural and urban areas (Table 1). In particular, the primary enrollment rates of non-CWDs are 23 percentage points and 17 percentage points higher than that of their counterparts in urban and rural areas, respectively. We observe a similar trend for the secondary level enrollment rate. Enrollment rates for non-CWDs are higher by more than 10 percentage points in both areas. Similarly, at the tertiary level, we also find that CWDs are in a disadvantageous position. Additionally, Table 1 shows mean differences of literacy status (reading and writing skills) where differences are observed in reading skills for both groups.

Table 2 shows the investment breakdown of educational expenditure, which is divided into six categories. Admission includes admission, seasonal, and registration fees. Tuition includes annual tuition and examination fees. Books includes textbooks and exercise books. Other costs include hostel costs, conveyance, internet and e-mail fees, meals, and other costs. Generally, tuition fees are the single-largest category of all expenditures. Other costs are higher in rural areas than in urban areas, which may indicate why transportation fees account for a relatively large proportion.

Table 3 shows the educational expenditure differential by schooling level and disability status for both urban and rural areas, and for both the entire child sample and the sample restricted to enrolled children only. The sample that includes out-of-school children suggests that there is a significant difference in educational expenditure at the primary level in rural areas. Surprisingly, there is little difference in educational investment by disability status for enrolled children. This may be because school

[4]The possibility of the problem of endogeneity of the impairment dummy is also rejected by the Durbin–Wu–Hausman test.

Table 1. **Differences in Educational Indices by Area and Disability Status**

	Urban				Rural			
	Non-CWDs	CWDs	Mean Difference (Non-CWDs Versus CWDs)	*t*-Value	Non-CWDs	CWDs	Mean Difference (Non-CWDs Versus CWDs)	*t*-Value
Enrollment (school-aged children)								
Primary level	0.69	0.47	0.23***	2.69	0.67	0.51	0.17***	3.36
Secondary level	0.45	0.34	0.11*	1.89	0.39	0.27	0.13***	2.75
Higher level	0.39	0.25	0.14*	1.86	0.28	0.18	0.10**	2.31
Literacy (school-aged children)								
Reading	0.76	0.59	0.17***	4.76	0.67	0.58	0.10***	3.58
Writing	0.97	0.97	0.00	0.09	0.96	0.98	−0.02	−1.41

CWDs = children with disabilities.

Notes: *, **, and *** represent significance in gap by disability at the 10%, 5%, and 1% levels, respectively. Enrollment rate is calculated using the proportion of enrolled children within school-aged children divided by the population of school-aged children. School age is defined following Kingdon (2005): primary level (aged 5–9 years), secondary (aged 10–14 years), and higher (aged 15–19 years). The definition of CWDs is children with disabilities below the age of 20 years old who acquire impairments such as visual, hearing, physical, cognitive, and communication.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

Table 2. **Breakdowns of Educational Expenditure by Area (%)**

	Urban			Rural		
	Public	Private	Madrasa	Public	Private	Madrasa
Admission fee	13.17	14.87	5.90	6.27	8.22	5.82
Tuition fee	48.36	52.96	43.54	35.81	40.71	33.61
Books	14.49	13.81	17.96	19.13	20.71	25.26
Uniform	5.65	5.14	8.93	10.45	8.04	11.45
Contribution (donation)	0.07	0.02	0.00	0.48	0.15	0.00
Other costs	18.26	13.20	23.67	27.86	22.17	23.86

Notes: Educational expenditure is divided into six categories. Admission includes admission fees, seasonal fees, and registration fees. Tuition includes annual tuition and examination fees. Books includes textbooks and excise books. Other costs are the sum of hostel costs, conveyance, internet and e-mail fees, tiffin (lunch), and other costs.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

Table 3. **Difference of Educational Expenditure by Area and Disability Status (Tk)**

	Urban				Rural			
	Non-CWDs	CWDs	Mean Difference (Non-CWDs Versus CWDs)	*t*-Value	Non-CWDs	CWDs	Mean Difference (Non-CWDs Versus CWDs)	*t*-Value
Educational expenditure for both enrolled and nonenrolled children								
Primary level	3,082.09	1,943.33	1,838.75	1.59	1,146.76	709.07	437.69*	1.90
Secondary level	6,762.93	4,345.00	2,417.93*	1.92	2,858.27	1,982.99	875.28**	2.51
Higher level	7,862.18	7,442.39	419.79	0.11	3,875.85	4,157.38	−281.53	−0.33
Educational expenditure for enrolled children								
Primary level	4,598.08	3,643.75	954.33	0.57	1,531.15	1,132.02	399.13	1.25
Secondary level	8,012.52	7,011.25	1,001.27	0.60	3,381.98	2,987.71	394.27	0.90
Higher level	15,916.88	16,373.25	−456.37	−0.06	9,385.83	11,997	−2,611.17	−1.41

CWDs = children with disabilities, Tk = Bangladesh taka.

Notes: * and ** represent significance at the 10% and 5% levels, respectively. Schooling age is defined following Kingdon (2005): primary level (aged 5–9 years), secondary (aged 10–14 years), and higher (aged 15–19 years). The definition of CWDs is children with disabilities below the age of 20 who acquire impairments such as visual, hearing, physical, cognitive, and communication.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

enrollment of CWDs can require more costs than that of non-CWDs when the infrastructure is not disability friendly, as well as when the proper support systems are not in place. However, once enrolled, the results reveal only small differences in educational expenditure.

Table 4 reports the descriptive statistics of the variables used for the regression analysis. This table also shows differences in child enrollment and educational spending between urban and rural areas. In the results of the *t*-test among variables between these areas, we can observe significant differences at the 1% level for the budget share of educational expenditure, total household expenditure, household size, and dependency ratio, clearly showing the advantages regarding education for households in urban areas in terms of income level, number of household members, and family structure. These results indicate that disparities in income level and educational achievement exist between urban and rural areas in Bangladesh.

B. Regression Results of Household-Level Analysis

Table 5 presents the results of household-level analysis for factors affecting the budget share of educational expenditure with disability-age category variables. We perform regression analysis separately for the entire sample, urban areas, and rural areas. Column (1) is the marginal effect in the probit model of whether parents enroll their child in school. Column (2) is the result of conditional OLS analysis when a child is enrolled. Column (3) shows the CME derived from the results of the probit and conditional OLS models. Finally, column (4) is the result of unconditional OLS analysis.

In the results of the entire sample and those broken down by rural or urban area, the log of monthly expenditure per capita has a positive and significant effect on the budget share for educational expenditure. These results reveal that income level is a strong predictor of educational investment, as found in Glewwe and Patrinos (1999) and Glewwe and Jacoby (2003). Household size has a positive correlation with educational expenditure, and this variable works appropriately as a control variable since larger households generally have more educational expenditure. The positive and significant effect of a household head's years of schooling on educational expenditure for their children is consistent as the educational level of household head or parents is considered a strong predictor of investment in their children's education (Behrman and Deolalikar 1995, Haveman and Wolfe 1995, Cameron and Heckman 1998). Similarly, the dummy variable of female household head shows that female bargaining power has a positive effect on both school enrollment and educational investment for their

Table 4. **Descriptive Statistics of Covariates at the Household and Individual Levels**

	Urban			Rural				
	Number of Obs.	Mean	Std. Dev.	Number of Obs.	Mean	Std. Dev.	Mean Difference (Urban–Rural)	*t*-Value
Variables for household-level analysis								
Share of educational expenditure	4,394	0.05	0.07	7,813	0.03	0.05	0.017***	15.62
Total monthly household expenditure (Tk)	4,394	13,852.34	11,803.18	7,813	9,655.47	7,422.88	4,196.872***	24.08
Household size (number of persons)	4,394	4.48	1.81	7,813	4.58	1.93	−0.107***	−3.01
Share of non-CWDs aged 5–9 years	4,399	0.10	0.14	7,840	0.12	0.15	−0.014***	−5.11
Share of CWDs aged 5–9 years	4,399	0.00	0.02	7,840	0.00	0.02	−0.001*	−1.94
Share of non-CWDs aged 10–14 years	4,399	0.10	0.14	7,840	0.11	0.14	−0.004	−1.36
Share of CWDs aged 10–14 years	4,399	0.00	0.03	7,840	0.00	0.02	0.0004	0.73
Share of non-CWDs aged 15–19 years	4,399	0.09	0.14	7,840	0.08	0.13	0.008***	3.06
Share of CWDs aged 15–19 years	4,399	0.00	0.02	7,840	0.00	0.02	−0.001	−1.46
Years of education of household head	4,387	5.95	5.72	7,823	3.08	4.29	2.875***	31.43
Household head is female (= 1)	4,387	0.13	0.33	7,823	0.15	0.36	−0.026***	−3.99
Household head with impairment (= 1)	4,387	0.14	0.35	7,823	0.18	0.38	−0.037***	−5.29
Household head is fulltime wage worker (= 1)	4,387	0.41	0.49	7,823	0.28	0.45	0.129***	14.75
Muslim (= 1)	4,399	0.89	0.32	7,840	0.87	0.33	0.012**	1.99
Hindu (= 1)	4,399	0.11	0.31	7,840	0.11	0.31	0.001	0.15
Dependency ratio	4,399	0.35	0.21	7,840	0.39	0.23	−0.047***	−11.20

Continued.

Table 4. *Continued.*

	Urban			Rural				
	Number of Obs.	Mean	Std. Dev.	Number of Obs.	Mean	Std. Dev.	Mean Difference (Urban–Rural)	*t*-Value
Variables for individual-level analysis								
Female (= 1)	19,636	0.50	0.50	35,796	0.51	0.50	−0.006	−1.42
Age (years)	19,636	27.02	18.93	35,796	26.45	19.95	0.566***	3.25
Impairment (= 1)	19,636	0.08	0.27	35,796	0.09	0.29	−0.012***	−4.75
Visual impairment (= 1)	19,636	0.06	0.24	35,796	0.06	0.24	−0.002	−0.91
Hearing impairment (= 1)	19,636	0.02	0.14	35,796	0.03	0.16	−0.007***	−5.16
Physical impairment (= 1)	19,636	0.02	0.13	35,796	0.03	0.16	−0.011***	−7.92
Cognitive impairment (= 1)	19,636	0.01	0.10	35,796	0.01	0.12	−0.004***	−4.24
Communication impairment (= 1)	19,636	0.01	0.08	35,796	0.01	0.10	−0.002***	−3.05
Mother's years of schooling	9,760	4.61	4.76	18,622	2.51	3.56	2.097***	41.80
Father's years of schooling	8,223	5.86	5.67	15,512	3.16	4.34	2.694***	40.77

CWDs = children with disabilities, Obs. = observations, Tk = Bangladesh taka.

Notes: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively. Among variables for household-level analysis, female head of household, household head with impairment, household head is fulltime wage worker, and Muslim and Hindu are dummy variables that take a value of either 0 or 1. Among variables for individual-level analysis, female, impairment, and types of impairment (i.e., visual, hearing, physical, cognitive, and communication) are dummy variables that take a value of either 0 or 1.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

Table 5. **Results of Household-Level Analysis**

	All				Urban				Rural			
	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS
Independent Variables	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Log of monthly expenditure per capita	0.480***	3.982***	0.082***	0.087***	0.442***	4.737***	0.083	0.096*	0.587***	4.289***	0.126***	0.132***
	(0.099)	(0.473)	(0.026)	(0.029)	(0.154)	(0.860)	(0.053)	(0.057)	(0.146)	(0.571)	(0.020)	(0.018)
Square of log of monthly expenditure per capita	−0.023***	−0.236***	−0.004**	−0.004**	−0.020**	−0.278***	−0.004	−0.005	−0.030***	−0.261***	−0.007***	−0.008***
	(0.006)	(0.030)	(0.002)	(0.002)	(0.009)	(0.053)	(0.003)	(0.004)	(0.009)	(0.037)	(0.001)	(0.001)
Log of household size	0.296***	0.207***	0.021***	0.023***	0.296***	0.185***	0.027***	0.029***	0.295***	0.236***	0.020***	0.021***
	(0.009)	(0.045)	(0.002)	(0.001)	(0.014)	(0.071)	(0.003)	(0.002)	(0.012)	(0.059)	(0.002)	(0.002)
Disability-age category variables												
Share of CWDs aged 5–9 years	0.733***	−0.132	0.037**	0.022	0.582**	0.404	0.036	0.036	0.853***	−0.218	0.036**	0.024
	(0.128)	(0.559)	(0.015)	(0.014)	(0.243)	(0.805)	(0.033)	(0.028)	(0.145)	(0.690)	(0.017)	(0.016)
Share of non-CWDs aged 5–9 years	1.149***	−0.169	0.065***	0.043***	1.218***	0.000	0.098***	0.075***	1.116***	−0.230	0.049***	0.030***
	(0.035)	(0.219)	(0.008)	(0.004)	(0.066)	(0.355)	(0.015)	(0.009)	(0.041)	(0.279)	(0.008)	(0.005)
Share of CWDs aged 10–14 years	0.811***	1.423***	0.081***	0.077***	1.050***	0.402	0.099***	0.079**	0.721***	1.932***	0.070***	0.072***
	(0.127)	(0.420)	(0.017)	(0.019)	(0.200)	(0.743)	(0.033)	(0.039)	(0.156)	(0.484)	(0.018)	(0.020)
Share of non-CWDs aged 10–14 years	1.147***	1.758***	0.107***	0.105***	1.083***	1.534***	0.130***	0.128***	1.179***	1.927***	0.093***	0.095***
	(0.038)	(0.215)	(0.008)	(0.005)	(0.066)	(0.340)	(0.014)	(0.010)	(0.045)	(0.279)	(0.008)	(0.005)
Share of CWDs aged 15–19 years	0.651***	1.555***	0.080***	0.083***	0.513**	3.296***	0.133***	0.117***	0.675***	0.932	0.061**	0.075***
	(0.127)	(0.590)	(0.023)	(0.022)	(0.216)	(0.860)	(0.044)	(0.043)	(0.149)	(0.719)	(0.025)	(0.026)
Share of non-CWD children 15–19 years	0.525***	1.920***	0.096***	0.098***	0.588***	1.942***	0.135***	0.124***	0.493***	1.926***	0.076***	0.086***
	(0.048)	(0.282)	(0.012)	(0.007)	(0.078)	(0.473)	(0.020)	(0.014)	(0.058)	(0.345)	(0.013)	(0.008)

Continued.

Table 5. *Continued.*

	All				Urban				Rural			
	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS
Independent Variables	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Household-level characteristics												
Years of schooling for household head	0.006***	0.060***	0.002***	0.002***	0.007***	0.057***	0.002***	0.003***	0.005***	0.054***	0.002***	0.002***
	(0.001)	(0.003)	(0.000)	(0.000)	(0.001)	(0.004)	(0.000)	(0.000)	(0.001)	(0.004)	(0.000)	(0.000)
Household head is female	0.029***	0.172***	0.007***	0.009***	0.013	0.199***	0.008**	0.012***	0.035***	0.156***	0.008***	0.008***
	(0.011)	(0.043)	(0.002)	(0.002)	(0.018)	(0.072)	(0.003)	(0.003)	(0.013)	(0.054)	(0.002)	(0.002)
Household head with disabilities	0.010	−0.090*	−0.002	−0.001	0.037*	−0.180**	−0.002	0.000	−0.003	−0.053	−0.002	−0.002
	(0.011)	(0.049)	(0.002)	(0.002)	(0.020)	(0.088)	(0.004)	(0.004)	(0.013)	(0.058)	(0.002)	(0.002)
Household head is fulltime wage worker	0.018***	0.121***	0.007***	0.006***	0.018	0.048	0.007***	0.007***	0.021**	0.164***	0.006***	0.006***
	(0.007)	(0.028)	(0.001)	(0.001)	(0.011)	(0.044)	(0.002)	(0.002)	(0.009)	(0.038)	(0.001)	(0.001)
Muslim	−0.017*	−0.136***	−0.006***	−0.006***	−0.01	−0.148***	−0.007**	−0.006*	−0.016	−0.110**	−0.004**	−0.005***
	(0.009)	(0.038)	(0.002)	(0.002)	(0.015)	(0.057)	(0.003)	(0.003)	(0.012)	(0.051)	(0.002)	(0.002)
Dependency ratio	0.069	−0.114	−0.008	0.001	0.104	0.354	0.017	0.009	0.047	−0.398	−0.019	−0.004
	(0.049)	(0.288)	(0.012)	(0.005)	(0.085)	(0.496)	(0.021)	(0.011)	(0.058)	(0.348)	(0.013)	(0.005)
Fixed effects												
District-level fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant		−20.686***		−0.417***		−24.316***		−0.503**		−21.305***		−0.560***
		(1.896)		(0.112)		(3.508)		(0.222)		(2.252)		(0.070)
Number of Observations	12,178	7,957	12,178	12,178	4,382	2,947	4,382	4,382	7,796	5,010	7,796	7,796

CWDs = children with disabilities, OLS = ordinary least squares.

Notes: Standard errors are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively. Standard errors of columns (1) (binary probit), (2) (conditional OLS), and (4) (unconditional OLS) are robust and clustered by household to consider the possibility that residuals within the same household are likely to be correlated. For column (3) (result of combined marginal effect: probit + conditional OLS), the standard error is obtained by bootstrapping with 400 replications. Dependent variable in probit model (column (1)) analysis is a binary variable of whether a household had educational expenditure in the past 12 months. The natural log of share of educational expenditure and absolute value of share of educational expenditure are dependent variables of columns (2) and (4), respectively. All equations include district-level fixed effects.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

children. This finding partly suggests that if a mother receives more education, she is likely to allow her children to receive more and better education. Takeda and Lamichhane (2018) found that mother's education can be an important predictor for CWDs to receive better education, claiming that strong female bargaining power can increase their understanding of CWDs in the household. Regardless of disability, some studies have also discussed the positive effect of the strong bargaining power of women (Thomas 1994, Duflo and Udry 2004).

The dummy variable of household head with disabilities also provides interesting results. While it shows an insignificant effect on the probability of children's enrollment in the analysis using the entire sample (i.e., all areas in Bangladesh) (column [1]), this variable is found to have a negative effect on educational expenditure at the 10% significance level (column [2]). Similarly, the dummy variable of disabled household head is positively correlated (column [1]) with child enrollment at the 10% significance level in the probit model, while it negatively affects the conditional share of expenditure at the 5% level (column [2]) in urban areas. These interesting findings suggest that if the household head has some form of disability, they are more likely to understand the value of access to education and thus enroll their children in schools. At the same time, as PWDs are more likely to experience poverty, they may not be able to afford educational fees once their child is enrolled. Finally, the dummy variable for household head as full-time wage earner is a strong predictor of educational expenditure, again suggesting that the income stability of parents and household heads is important in terms of investing in their children's education.

We test the DME for disability-age variables for each school-aged group to confirm whether a biased allocation of parental investment toward CWDs exists (Table 6). The DME shows a difference in the value of non-CWDs minus the marginal effect of CWDs. We test whether this difference is statistically significant (equation [2]) and observe a clear bias against CWDs in the results for the entire sample. In column (1), which examines disability bias in enrollment using the probit model analysis, the DME of children aged 5–9 years and 10–14 years are positive and statistically significant at the 1% level. This finding suggests the likelihood of bias in age for primary and secondary education. In column (2), which is the conditional OLS regression model, no significant results for the DME are observed.

We attempt to identify biases in educational expenditure by restricting to households with only enrolled children but found insignificant results. This finding suggests that the bias or discrimination for CWDs exists at the stage of deciding whether to enroll them in school, but once they are enrolled, they may not experience significant bias. In column (3), which shows the CME of the probit and conditional

Table 6. **Summary of Difference in Marginal Effect × 100 of Household-Level Analysis**

	All Areas				Urban				Rural			
	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS	Probit	Conditional OLS	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS
Independent Variables	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Children aged 5–9 years	41.59*** (0.001)	−3.75 (0.943)	2.84** (0.034)	2.12 (0.126)	63.62*** (0.008)	−40.40 (0.584)	6.17** (0.041)	3.93 (0.151)	26.27* (0.064)	−1.19 (0.985)	1.23 (0.440)	0.61 (0.706)
Children aged 10–14 years	33.58*** (0.008)	33.51 (0.371)	2.68* (0.086)	2.83 (0.140)	3.26 (0.869)	113.27* (0.098)	3.11 (0.317)	4.89 (0.211)	45.79*** (0.003)	−0.43 (0.992)	2.29 (0.183)	2.29 (0.257)
Children aged 15–19 years	−12.61 (0.295)	36.51 (0.494)	1.55 (0.432)	1.51 (0.501)	7.52 (0.714)	−135.47 (0.066)	0.12 (0.978)	0.62 (0.883)	−18.18 (0.199)	99.4 (0.129)	1.48 (0.507)	1.10 (0.681)

OLS = ordinary least squares.

Notes: Each value shows the difference in the marginal effect (DME) of disability-age category variables, which is multiplied by 100. The DME is the difference in the coefficient or marginal effect of a child with disabilities and a child without disabilities (= non-CWDs–CWDs) for each age category; positive value shows the existence of disability bias. The figures in parentheses are *P*-values of the *F*-test that DME is equal to zero. *, **, and *** represent significance in gap by disability at the 10%, 5%, and 1% levels, respectively.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

OLS models, the DMEs in cohorts of children aged 5–9 years and 10–14 years are positive and significant at the 5% and 10% levels, respectively, while in column (4) for the unconditional model, no cohorts show significant effects. Again, these results suggest that there is a bias mainly in the enrollment decision; the significant difference is reflected in the probit model and CME. Moreover, disability bias is found at the primary and secondary levels for all areas, indicating that such bias exists at the stage of providing basic education.

Parents' investment motives regarding children's education could reflect unequal allocations to the differential returns of CWDs and non-CWDs. We assume that parents' expectation of returns to education of CWDs is much lower than that of non-CWDs (i.e., the expected contribution to household income is lower). This gap in parents' expectation of returns is larger than the gap between boys and girls, even in developing countries, as parents expect to face more physical and institutional barriers when they raise CWDs compared to non-CWDs (including girls). Findings for both rural and urban areas consistently suggest the likelihood of biases, mainly in the decision whether to enroll their child. Unlike the results in rural areas, we did not find significant differences for secondary level enrollment for CWDs in urban areas.

Additionally, although it is important to identify which impairment groups are more vulnerable to household investment disparities for their schooling and which impairments drive the disability bias, due to the smaller sample size, we are not able to perform statistical analysis. Nonetheless, we want to see descriptively if there exist any gaps among different impairment groups. We have presented this descriptive table in the appendix. Except for the primary level, individuals with visual impairments have higher enrollment rates among different disability types: 51% and 31% for secondary and higher-level enrollment, respectively. For enrollment at the primary level, participants who are deaf and hard of hearing have higher enrollment rates (57%). Likewise, the enrollment rate for participants with physical impairments (29%, 14%, and 0%), cognitive difficulties (17%, 7%, and 7%), and communication difficulties (12%, 6%, and 0%) is observed for primary, secondary, and higher education, respectively. Furthermore, for literacy in reading and writing, which are considered important components for academic achievement, participants with visual impairments, hearing difficulties, and physical impairments have higher literacy rates than those with cognitive and communication difficulties. Literacy rates of 71%, 49%, 39%, 22%, and 22% are observed, respectively, for participants with visual impairments, hearing impairments, physical impairments, cognitive difficulties, and communication difficulties. As Lamichhane (2013) and Takeda and Lamichhane (2018) acknowledge, our findings indicate that if the different needs of each disability

group are not addressed, then children with severe difficulties may face significant barriers in education.

For writing literacy, we find a similar trend: groups of children with visual or hearing impairments (98%), physical impairments (95%), cognitive difficulties (95%), and communication difficulties (96%). Though we find gaps for enrollment depending on the disability type, we cannot conclude if they are consistent as the already small sample size further decreases at the secondary and higher education levels, thus not allowing us to explore it further. Similarly, the question on reading and writing literacy asked only whether the participant can read or write a letter or not. These are plausible reasons for the higher performance of individuals with different impairment groups in reading and writing. Furthermore, though we find an enrollment disparity for girls versus boys with disabilities at the primary level, based on our econometric analysis, we see an improvement in gender parity in the enrollment of girls at the primary education level, which can be attributed to various demand-side interventions taking place in Bangladesh.

C. Regression Results of Individual-Level Analysis

1. Reaffirming Disability Bias

We run individual-level regressions and compare the results of household-level analysis with individual child data. Table 7 reports the results of individual-level analysis for children aged 5–9 years (entire sample). In addition to the impairment dummy, we prepared two variables that explain the timing of acquiring disability: impairment at birth and impairment acquired during enrollment. These are incorporated into our estimation with the aim of identifying differences in disability-based bias toward CWDs depending on when the impairment first occurred. As these dummy variables can be used as interaction terms between impairment dummy and impairment timing, the results (coefficients and marginal effects) need to be interpreted with a combination of these variables. We also present the results of estimation with and without interaction term variables between other individual and household characteristics (i.e., interactions with female, parents' education, and household head is full-time wage worker).

In Table 7 (primary level children), the impairment dummy has a negative effect on the probability of enrolling in elementary school at the 1% significance level (column [1]). This finding suggests that CWDs are less likely to enroll in primary school due to bias on the part of their parents, who may not consider their CWDs as a subject for investment in education. In addition, the dummy variable of impairment

Table 7. **Results of Individual-Level Analysis (All Areas: Aged 5–9 Years)**

	Aged 5–9 years							
	Probit	**Probit with Interaction**	**Conditional OLS**	**Conditional OLS with Interaction**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Combined Marginal Effect (Probit + Conditional OLS) with Interaction**	**Unconditional OLS**	**Unconditional OLS with Interaction**
Independent Variables	**(1)**	**(1)**	**(2)**	**(2)**	**(3)**	**(3)**	**(4)**	**(4)**
Log of monthly expenditure per capita	0.097***	0.097***	1.022***	1.023***	1.391***	1.393***	2,940.078***	2,943.689***
	(0.015)	(0.015)	(0.049)	(0.049)	(0.094)	(0.095)	(245.002)	(244.848)
Log of household size	0.007	0.007	0.002	0.000	0.047	0.045	138.164	131.262
	(0.019)	(0.019)	(0.070)	(0.070)	(0.120)	(0.121)	(242.910)	(242.565)
Individual characteristics								
Female	0.021**	0.021**	−0.083**	−0.078**	0.074	0.075	−134.956	−131.214
	(0.010)	(0.010)	(0.033)	(0.033)	(0.073)	(0.073)	(96.696)	(98.362)
Age	0.137***	0.137***	0.213***	0.211***	1.047***	1.045***	460.524***	456.614***
	(0.003)	(0.003)	(0.014)	(0.014)	(0.024)	(0.024)	(33.415)	(33.412)
Impairment	−0.155***	−0.177**	0.025	0.785**	−0.982**	−0.557	−497.632	830.843**
	(0.056)	(0.077)	(0.288)	(0.323)	(0.455)	(0.666)	(347.111)	(373.028)
Impairment by birth	−0.155*	−0.160*	−0.326	−0.591*	−1.246*	−1.479**	−346.848	−776.135**
	(0.085)	(0.087)	(0.417)	(0.338)	(0.662)	(0.664)	(449.503)	(377.773)
Impairment acquired during enrollment	0.181*	0.199*	−0.25	−0.552*	0.984	0.874	−335.077	−742.783**
	(0.104)	(0.109)	(0.351)	(0.310)	(0.699)	(0.793)	(500.550)	(376.489)

Continued.

Table 7. *Continued.*

	Aged 5–9 years							
	Probit	Probit with Interaction	Conditional OLS	Conditional OLS with Interaction	Combined Marginal Effect (Probit + Conditional OLS)	Combined Marginal Effect (Probit + Conditional OLS) with Interaction	Unconditional OLS	Unconditional OLS with Interaction
Independent Variables	**(1)**	**(1)**	**(2)**	**(2)**	**(3)**	**(3)**	**(4)**	**(4)**
Household characteristics								
Dependency ratio	0.023	0.024	−0.436***	−0.432***	−0.174	−0.166	607.679	629.913
	(0.044)	(0.044)	(0.153)	(0.153)	(0.292)	(0.294)	(452.140)	(452.520)
Mother's years of schooling	0.010***	0.009***	0.041***	0.041***	0.095***	0.091***	134.451***	133.586***
	(0.002)	(0.002)	(0.006)	(0.006)	(0.013)	(0.012)	(20.362)	(20.663)
Father's years of schooling	0.006***	0.006***	0.036***	0.037***	0.063***	0.066***	102.469***	106.438***
	(0.002)	(0.002)	(0.006)	(0.006)	(0.012)	(0.012)	(14.718)	(14.913)
Household head is female	−0.013	−0.013	0.093	0.093	−0.015	−0.012	−195.44	−197.052
	(0.038)	(0.038)	(0.119)	(0.119)	(0.264)	(0.264)	(310.046)	(310.650)
Household head with disabilities	0.001	0.002	−0.086*	−0.083	−0.055	−0.051	172.899	179.377
	(0.017)	(0.017)	(0.052)	(0.052)	(0.111)	(0.113)	(260.389)	(260.511)
Household head is fulltime wage worker	0.013	0.011	0.115**	0.115**	0.168*	0.160*	202.648	199.823
	(0.013)	(0.013)	(0.046)	(0.046)	(0.091)	(0.092)	(156.478)	(158.880)
Muslim	0.026	0.026	−0.216***	−0.214***	0.008	0.006	−422.647**	−421.178**
	(0.017)	(0.017)	(0.064)	(0.063)	(0.111)	(0.111)	(192.789)	(192.856)
Interaction terms								
Impairment × Female		0.004		−0.213		−0.133		108.49
		(0.080)		(0.288)		(0.677)		(331.699)

Continued.

Table 7. *Continued.*

	Aged 5–9 years							
	Probit	**Probit with Interaction**	**Conditional OLS**	**Conditional OLS with Interaction**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Combined Marginal Effect (Probit + Conditional OLS) with Interaction**	**Unconditional OLS**	**Unconditional OLS with Interaction**
Independent Variables	**(1)**	**(1)**	**(2)**	**(2)**	**(3)**	**(3)**	**(4)**	**(4)**
Impairment × Mother's years of schooling		0.016		−0.005		0.101		−75.806
		(0.013)		(0.039)		(0.118)		(60.566)
Impairment × Father's years of schooling		−0.013		−0.139***		−0.188		−276.359***
		(0.013)		(0.048)		(0.120)		(53.772)
Impairment × Household head is fulltime wage worker		0.062		−0.21		0.244		−182.221
		(0.108)		(0.361)		(0.950)		(444.352)
Fixed effect								
District-level fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant			−2.178***	−2.166***			−23,924.923***	−23,916.151***
			(0.433)	(0.433)			(2,259.818)	(2,256.811)
Number of Observations	5,694	5,694	4,259	4,259	5,694	5,694	5,694	5,694

OLS = ordinary least squares.

Notes: Standard errors are in parentheses. *, **, and *** represent significance in the marginal effects of independent variables at the 10%, 5%, and 1% levels, respectively. Standard errors of column (1) (binary probit), column (2) (conditional OLS), and column (4) (unconditional OLS) are robust and clustered by household to consider the possibility that residuals within the same household are likely to be correlated. For column (3) (result of combined marginal effect: probit + conditional OLS), the standard error is obtained by bootstrapping with 400 replications. The dependent variable in the probit model (column (1)) analysis is a binary variable of whether a household has had any educational expenditure in the past 12 months for each child. The natural log of educational expenditure and the absolute value of educational expenditure for each child are the dependent variables of columns (2) and (4), respectively. All equations include district-level fixed effects.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

from birth has a negative effect and the dummy variable of impairment while in education has a positive effect at the 10% significance level. This finding suggests that fewer children with congenital impairments who are enrolled in education are more likely to experience disability-based bias compared to children acquiring impairment during primary school age. For conditional OLS, significant results are shown only for estimations with interaction terms. The impairment dummy has a positive effect on educational expenditure for enrolled CWDs at the 5% significance level. Both the dummy variables of impairment at birth and acquired during enrollment have negative effects at the 10% significance level. These results suggest that even if children have impairments, enrolled CWDs can receive more educational investment. We can assume that such investment includes extra expenditure particular to their needs. However, the degree of these extra investments decreases for children who are impaired from birth or acquire it during primary school age. Importantly, CME shows different results from unconditional OLS and can appropriately extract the negative disability-based bias. The disability dummy in the result of CME without interaction terms is negatively significant at the 5% level, while that of unconditional OLS without interaction terms is not significant. Combined with the results of the dummy variable of impairment at birth, results are consistent with the fact that children with congenital impairments face disability bias more than those who acquire it later in life. On the other hand, considering both the enrollment decision and how much to spend for enrolled children, we find that the major difficulty for CWDs is having the opportunity to enroll in schools. Once enrolled, parents are likely to invest in them as results show that the impairment dummy is negative regarding enrollment but positive or not significant for conditional educational expenditure.

Tables 8 and 9 report the results for children aged 10–14 years and 15–19 years, respectively. The disability dummy in Table 8 is negatively correlated with individual educational expenditure for all estimations except for unconditional OLS without interaction terms. Compared with the results in Table 7 (primary school age), the results in Table 8 suggest that CWDs are disadvantaged, having a significantly lower probability of enrollment given the lower level of investment in education by their parents. Based on this finding, we cannot reject the possibility of disability bias even if CWDs are enrolled in secondary school. Due to disability-related biases, parents are likely to consider that education is less important for CWDs. Therefore, in terms of investment, since secondary education is not compulsory in Bangladesh, it is likely that parents do not feel an obligation to educate CWDs beyond primary level. Finally, in Table 9, we obtain no significant results regarding these disability-related variables, indicating that hardly any disability bias exists in higher education.

Table 8. **Results of Individual-Level Analysis (All Areas: Aged 10–14 Years)**

	Aged 10–14 years							
	Probit	**Probit**	**Conditional OLS**	**Conditional OLS**	**Combined Marginal Effect (Probit+ Conditional OLS)**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Unconditional OLS**	**Unconditional OLS**
Independent Variables	**(1)**	**(1)**	**(2)**	**(2)**	**(3)**	**(3)**	**(4)**	**(4)**
Log of monthly expenditure per capita	0.143***	0.146***	0.971***	0.971***	1.904***	1.920***	2,940.078***	5,268.570***
	(0.014)	(0.014)	(0.038)	(0.038)	(0.108)	(0.107)	(245.002)	(378.583)
Log of household size	0.017	0.018	0.117**	0.118**	0.231*	0.239*	138.164	781.606**
	(0.017)	(0.017)	(0.051)	(0.051)	(0.124)	(0.124)	(242.910)	(351.163)
Individual characteristics								
Female	0.097***	0.099***	−0.035	−0.039	0.702***	0.716***	−134.956	230.399
	(0.009)	(0.009)	(0.026)	(0.026)	(0.072)	(0.073)	(96.696)	(147.094)
Age	−0.047***	−0.048***	0.223***	0.223***	−0.171***	−0.173***	460.524***	552.725***
	(0.003)	(0.003)	(0.009)	(0.009)	(0.026)	(0.027)	(33.415)	(47.340)
Impairment	−0.227***	−0.156***	−0.393**	−0.498***	−2.049***	−1.597***	−497.632	−1,636.995**
	(0.052)	(0.050)	(0.158)	(0.173)	(0.407)	(0.408)	(347.111)	(735.784)
Impairment at birth	−0.019	−0.017	−0.205	−0.111	−0.318	−0.219	−346.848	−996.727
	(0.068)	(0.062)	(0.250)	(0.236)	(0.545)	(0.509)	(449.503)	(837.842)
Impairment acquired during enrollment	0.217***	0.210***	0.339*	0.351**	1.928***	1.889***	−335.077	1,999.258***
	(0.063)	(0.056)	(0.189)	(0.169)	(0.517)	(0.482)	(500.550)	(753.266)

Continued.

Table 8. *Continued.*

	Aged 10–14 years							
	Probit	Probit	Conditional OLS	Conditional OLS	Combined Marginal Effect (Probit+ Conditional OLS)	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS	Unconditional OLS
Independent Variables	(1)	(1)	(2)	(2)	(3)	(3)	(4)	(4)
Household characteristics								
Dependency ratio	−0.087**	−0.085**	0.226**	0.222**	−0.466*	−0.460	607.679	1,410.162**
	(0.036)	(0.036)	(0.105)	(0.105)	(0.281)	(0.283)	(452.140)	(672.861)
Mother's years of schooling	0.015***	0.016***	0.031***	0.030***	0.141***	0.146***	134.451***	270.593***
	(0.002)	(0.002)	(0.005)	(0.005)	(0.015)	(0.016)	(20.362)	(34.307)
Father's years of schooling	0.010***	0.011***	0.030***	0.031***	0.103***	0.107***	102.469***	182.871***
	(0.002)	(0.002)	(0.004)	(0.004)	(0.012)	(0.013)	(14.718)	(24.973)
Household head is female	0.006	0.002	−0.125	−0.123	−0.06	−0.087	−195.440	698.664
	(0.040)	(0.040)	(0.133)	(0.133)	(0.349)	(0.350)	(310.046)	(1,315.242)
Household head with disabilities	−0.026**	−0.025*	−0.036	−0.036	−0.225**	−0.217**	172.899	58.622
	(0.013)	(0.013)	(0.038)	(0.038)	(0.107)	(0.107)	(260.389)	(238.451)
Household head is fulltime wage worker	−0.005	0.000	0.087**	0.078**	0.038	0.062	202.648	721.663***
	(0.013)	(0.013)	(0.035)	(0.036)	(0.106)	(0.108)	(156.478)	(226.229)
Muslim	−0.003	−0.003	−0.135***	−0.136***	−0.137	−0.136	−422.647**	−359.698
	(0.015)	(0.015)	(0.043)	(0.043)	(0.123)	(0.123)	(192.789)	(222.773)
Interaction terms								
Impairment × Female		−0.048		0.184		−0.209		194.388
		(0.048)		(0.162)		(0.405)		(760.037)

Continued.

Table 8. *Continued.*

	Aged 10–14 years							
	Probit	Probit	Conditional OLS	Conditional OLS	Combined Marginal Effect (Probit+ Conditional OLS)	Combined Marginal Effect (Probit + Conditional OLS)	Unconditional OLS	Unconditional OLS
Independent Variables	(1)	(1)	(2)	(2)	(3)	(3)	(4)	(4)
Impairment × Mother's years of schooling		−0.009		0.012		−0.059		51.821
		(0.009)		(0.024)		(0.076)		(167.526)
Impairment × Father's years of schooling		−0.006		−0.029*		−0.069		−209.280**
		(0.007)		(0.015)		(0.068)		(99.171)
Impairment × Household head is fulltime wage worker		−0.094		0.433**		−0.344		852.632
		(0.071)		(0.221)		(0.594)		(1,247.332)
Fixed effect								
District-level fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant			−2.287***	−2.271***			−45,154.367***	−45,133.669***
			(0.374)	(0.374)			(3,356.073)	(3,371.935)
Number of Observations	5,441	5,441	4,586	4,586	5,441	5,441	5,441	5,441

OLS = ordinary least squares.

Notes: Standard errors are in parentheses. *, **, and *** represent significance in the marginal effects of independent variables at the 10%, 5%, and 1% levels, respectively. Standard errors of column (1) (binary probit), column (2) (conditional OLS), and column (4) (unconditional OLS) are robust and clustered by household to consider the possibility that residuals within the same household are likely to be correlated. For column (3) (result of combined marginal effect: probit + conditional OLS), the standard error is obtained by bootstrapping with 400 replications. The dependent variable in the probit model (column (1)) analysis is a binary variable of whether a household had any educational expenditure in the past 12 months for each child. The natural log of educational expenditure and the absolute value of educational expenditure for each child are the dependent variables of columns (2) and (4), respectively. All equations include district-level fixed effects.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

Table 9. **Results of Individual-Level Analysis (All Areas: Aged 15–19 Years)**

	Aged 15–19 years							
	Probit	**Probit**	**Conditional OLS**	**Conditional OLS**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Unconditional OLS**	**Unconditional OLS**
Independent Variables	**(1)**	**(1)**	**(2)**	**(2)**	**(3)**	**(3)**	**(4)**	**(4)**
Log of monthly expenditure per capita	0.235***	0.235***	0.854***	0.853***	2.493***	2.494***	10,358.898***	10,387.140***
	(0.021)	(0.021)	(0.049)	(0.049)	(0.172)	(0.172)	(2,058.823)	(2,064.466)
Log of household size	0.053*	0.056**	0.269***	0.265***	0.603***	0.624***	1,782.711**	1,759.864**
	(0.028)	(0.028)	(0.067)	(0.068)	(0.223)	(0.225)	(741.187)	(738.537)
Individual characteristics								
Female	0.131***	0.135***	−0.119***	−0.124***	1.082***	1.112***	−176.560	−289.628
	(0.014)	(0.014)	(0.033)	(0.033)	(0.126)	(0.128)	(672.459)	(699.117)
Age	−0.076***	−0.076***	0.074***	0.074***	−0.621***	−0.621***	−87.226	−85.718
	(0.005)	(0.005)	(0.013)	(0.013)	(0.044)	(0.044)	(186.921)	(188.112)
Impairment	−0.081	−0.034	0.121	0.017	−0.646	−0.291	1688.746	1391.512
	(0.084)	(0.088)	(0.280)	(0.320)	(0.810)	(0.934)	(1,287.444)	(1,615.110)
Impairment at birth	−0.109	−0.026	−0.346	−0.270	−1.129	−0.363	−676.478	−989.758
	(0.113)	(0.115)	(0.401)	(0.405)	(1.060)	(1.182)	(3,049.862)	(2,725.554)
Impairment acquired during enrollment	0.104	0.183*	0.051	0.044	0.930	1.615	−830.625	−151.496
	(0.106)	(0.107)	(0.307)	(0.303)	(1.045)	(1.140)	(2,032.072)	(1,914.476)

Continued.

Table 9. *Continued.*

	Aged 15–19 years							
	Probit	**Probit**	**Conditional OLS**	**Conditional OLS**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Unconditional OLS**	**Unconditional OLS**
Independent Variables	**(1)**	**(1)**	**(2)**	**(2)**	**(3)**	**(3)**	**(4)**	**(4)**
Household characteristics								
Dependency ratio	−0.046	−0.050	−0.008	−0.009	−0.406	−0.440	1,103.663	1,190.330
	(0.051)	(0.051)	(0.126)	(0.126)	(0.423)	(0.424)	(1,319.547)	(1,316.366)
Mother's years of schooling	0.022***	0.022***	0.021***	0.020***	0.205***	0.205***	748.261***	741.794***
	(0.003)	(0.003)	(0.006)	(0.006)	(0.027)	(0.027)	(205.037)	(209.653)
Father's years of schooling	0.014***	0.014***	0.015***	0.015***	0.126***	0.127***	221.172***	231.851***
	(0.002)	(0.002)	(0.005)	(0.005)	(0.020)	(0.020)	(70.528)	(69.167)
Household head is female	−0.045	−0.046	−0.093	−0.090	−0.443	−0.448	−2,279.240	−2445.86
	(0.097)	(0.097)	(0.189)	(0.190)	(0.954)	(0.958)	(2,079.269)	(2,008.789)
Household head with disabilities	−0.024	−0.022	0.051	0.049	−0.183	−0.168	146.678	144.703
	(0.020)	(0.020)	(0.044)	(0.044)	(0.163)	(0.163)	(522.590)	(513.782)
Household head is fulltime wage worker	0.007	0.011	0.086**	0.090**	0.102	0.144	−176.290	−76.711
	(0.019)	(0.019)	(0.040)	(0.040)	(0.163)	(0.167)	(1,404.275)	(1,441.509)
Muslim	−0.002	−0.002	−0.129***	−0.130***	−0.082	−0.087	−814.591	−786.218
	(0.022)	(0.023)	(0.050)	(0.050)	(0.198)	(0.200)	(630.650)	(633.883)
Interaction terms								
Impairment × Female		−0.133		0.319		−0.997		4,205.383*
		(0.087)		(0.240)		(0.930)		(2,315.953)

Continued.

Table 9. *Continued.*

	Aged 15–19 years							
	Probit	**Probit**	**Conditional OLS**	**Conditional OLS**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Combined Marginal Effect (Probit + Conditional OLS)**	**Unconditional OLS**	**Unconditional OLS**
Independent Variables	**(1)**	**(1)**	**(2)**	**(2)**	**(3)**	**(3)**	**(4)**	**(4)**
Impairment × Mother's years of schooling		0.007		0.047		0.082		251.391
		(0.020)		(0.032)		(0.219)		(598.876)
Impairment × Father's years of schooling		−0.01		−0.024		−0.099		−361.507
		(0.012)		(0.026)		(0.131)		(243.893)
Impairment × Household head is fulltime wage worker		−0.137		−0.313		−1.354		−5,084.805
		(0.110)		(0.264)		(1.266)		(3,437.347)
Fixed effect								
District-level fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant			0.365	0.392			−77,366.441***	−77,537.626***
			(0.478)	(0.477)			(18,016.466)	(18,084.263)
Number of Observations	3,598	3,598	1,883	1,883	3,598	3,598	3,598	3,598

OLS = ordinary least squares.

Notes: Standard errors are in parentheses. *, **, and *** represent significance in the marginal effects of independent variables at the 10%, 5%, and 1% levels, respectively. Standard errors of column (1) (binary probit), column (2) (conditional OLS), and column (4) (unconditional OLS) are robust and clustered by household to consider the possibility that residuals within the same household are likely to be correlated. For column (3) (result of combined marginal effect: probit + conditional OLS), the standard error is obtained by bootstrapping with 400 replications. The dependent variable in the probit model (column (1)) analysis is a binary variable of whether a household had any educational expenditure in the past 12 months for each child. The natural log of educational expenditure and the absolute value of educational expenditure for each child are the dependent variables of columns (2) and (4), respectively. All equations include district-level fixed effects.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

2. Disability Bias for Girls

While analyzing girls and disability, we generally find pro-female bias in enrollment at all levels of education and pro-male bias in investment on education for enrolled children in primary and higher education. This might reflect the evidence that the returns to education for girls are the same as or even higher than for boys (Behrman and Deolalikar 1995), and therefore, parents might allow girls to enroll in school. Additionally, recent and ongoing global initiatives for girls' education in line with the United Nations Sustainable Development Goals and other related plans could have contributed to increasing access to education for girls. These findings are consistent with previous studies on intrahousehold gender bias such as Azam and Kingdon (2013) and Kingdon (2005). Though Bangladesh is expanding access to basic education for girls, when compared to their male counterparts, girls may still face challenges to continuing their education as results show a negative effect on educational expenditure for enrolled children. The difference between girls and CWDs is that girls are found to not face gender bias for enrollment, while disability bias exists for enrollment and even beyond the primary level of education. Moreover, girls with disabilities are expected to face severe discrimination and are regarded as being in a disadvantageous position compared to boys with disabilities, as the former may experience both gender and disability bias. Although we tried to examine it by incorporating an interaction term between the female dummy and impairment dummy, we generally could not obtain significant findings to support this argument.

3. The Effects of Parental Education on Disability

Unlike other studies that have shown that parents' years of schooling generally have a positive effect on a child's education (Behrman and Deolalikar 1995, Cameron and Heckman 1998), we find a negative correlation between a CWD's father's education and educational expenditure on enrolled children, whereas no correlation is observed between a CWD's mother's education and child enrollment. Takeda and Lamichhane (2018) found that in India the mother's, but not necessarily the father's, education level can be an important predictor of the school enrollment of CWDs. In this sense, investment in girls' education is crucial and should be increased as these girls will become mothers who affect enrollment decisions in the future.

Finally, we also incorporate a dummy variable of whether the household head is a fulltime wage earner, as we do in the household-level analysis. The interaction terms between the impairment dummy and this variable show a positive effect on educational expenditure for CWDs aged 10–14 years in the entire sample. This finding indicates

that the income stability of the household head is connected to a greater probability of their CWDs receiving more investment in secondary education.

4. Bargaining Power of Persons with Disabilities

Finally, we test whether PWDs having decision-making power in the household helps improve the educational situation of their children. This is with the casual observation that individuals with disabilities who are in a decision-making position may have a deep and fair understanding of the importance of education for all children regardless of disability status. Following Masterson (2012), we incorporate a variable to test female bargaining power or objective bias. We incorporate a dummy variable of female household head as a proxy for female bargaining power.

Although previous studies demonstrate that strong female bargaining power is crucial to improving their children's education (Thomas 1994, Duflo and Udry 2004), we mostly find no significant results in our individual-level analysis, whereas the results are positive and significant in the household-level analysis. We obtain significant results for the variable for household head with disabilities. In Table 7, the dummy variable for household head with disabilities is negative in conditional OLS (without interaction), suggesting the difficulty for such household heads regarding educational spending even if their children are already enrolled.

In Table 8, this variable is negatively correlated with the enrollment decision, as shown in the probit model. Again, this finding suggests that household heads with disabilities face difficulty sending their children to secondary school itself. This finding is consistent with the educational situation in Bangladesh in which primary education up to grade 5 is free and compulsory, enabling parents to send their children to school at low cost. Once their children are in secondary level education, they have to pay costs such as tuition. Financing for education may, therefore, be a challenge for rural household heads with a disability who may be struggling with poverty. These results lead to our interpretation that the bargaining power of household heads with a disability is conditional on income stability. Regardless of how deep their understanding of the importance of education for their children is, they cannot have bargaining power without being financially stable themselves. Some of the findings in our individual-level analysis that show a negative effect of household heads with disabilities on enrollment support this argument.

5. Household Fixed Effect

By controlling all household-level characteristics with a household fixed-effects model, we rigorously check whether disability bias exists. As shown in Table 10, we

Table 10. **Summary of Marginal Effect of Impairment Dummy with Household Fixed Effects**

	All			Urban			Rural		
	Probit	Conditional OLS	Unconditional OLS	Probit	Conditional OLS	Unconditional OLS	Probit	Conditional OLS	Unconditional OLS
Age Category	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**
Children aged	−0.478***	−0.012	−325.664	−0.427***	−0.274	−869.829	−0.433***	−0.437	−419.577**
5–9 years	(0.110)	(0.437)	(231.414)	(0.084)	(0.255)	(865.247)	(0.123)	(0.293)	(204.000)
Children aged	−0.332***	−0.350	−1,522.422**	−0.428***	−0.467	−2,158.441*	−0.185***	−0.437	−1,113.266*
10–14 years	(0.074)	(0.232)	(628.317)	(0.080)	(0.353)	(1190.122)	(0.050)	(0.293)	(629.094)
Children aged	0.062	−0.247	1,868.021	0.589***	−0.341	3,917.548	−0.099	−0.194	774.447
15–19 years	(0.112)	(0.850)	(2,384.077)	(0.106)	(1.180)	(3,210.105)	(0.132)	(0.674)	(3,186.215)

OLS = ordinary least squares.

Notes: Robust standard errors are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively. For each column, the marginal effects of the impairment dummy are presented. The equations are fitted only to the subsample of households who have at least two children, one being disabled. Individual characteristics (i.e., female dummy, age) are included as controls.

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.

obtain mostly similar results with previous tables showing individual-level analysis, confirming that our findings are robust.

V. Conclusion

Utilizing a nationally representative dataset from Bangladesh, we examine disability bias in household investment decisions regarding education. We apply the hurdle model, which enables us to consider investment decisions more systematically, to household analysis based on the Engel curve. Consequently, we find the existence of disability bias on the part of parents, especially with regard to the enrollment decision for their children. Results from the direct method using the individual child dataset suggest that there is also a possibility of disability bias in investment decisions even for children who are already enrolled.

Additionally, individual-level analysis provides ample evidence of disability bias. Variables on the bargaining power of PWDs suggest that they have low bargaining power in terms of educational investment for their children. Similarly, interaction effects suggest the importance of income stability and mother's education as instrumental in improving the education of disabled children.

By investing heavily in non-CWDs, parents attempt to provide them with a competitive advantage in the acquisition of both resources and mates. However, wealthier and economically stable parents opt for a more opportunistic strategy of educational investment that does not discriminate between offspring regardless of disability status. Therefore, at the household level, strategies aiming to increase the financial stability of parents who have CWDs are important. It is also equally necessary to design programs to increase parents' awareness of the fact that investment in education for CWDs produces two- or three-times higher wage returns (Lamichhane and Sawada 2013). Investment discrimination regarding disability has a detrimental effect on the accumulation of human capital, thereby depriving both individuals and societies of the benefits of private and social returns. This is, therefore, a sufficient reason for adopting affirmative action plans and anti-discrimination educational policies. Besides programs that raise awareness, government support programs such as conditional cash transfers or other encouraging alternatives may be effective in reducing parental investment disparity and increasing access to quality education.

The main purpose of this study is to identify whether disability-based bias exists and to clarify the direct causality between a child's disability and parents' investment decisions. However, our research is a preliminary attempt at examining this issue, and

further study with a more organized dataset is required to examine the causality. Similarly, the presence of a disabled child may affect the family to a large extent. In particular, the disability of a child may affect the mother's fertility behavior; that is, caring for a disabled child may require more time and financial resources, preventing the family from having another child. As this important information is not captured by the 2010 Bangladesh HIES, we could not examine the effect of birth order and whether there is a difference in the number of children if one of the older children is disabled compared to one of the younger children. While we cannot reject the possible bias related to these issues, future research can examine the effect of disability on fertility decisions, which in turn may affect educational investment decisions.

Additionally, although we were able to examine the disability biases for intrahousehold investment decisions in education generally, we could not identify which types of impairment actually drive the disability bias. Depending on the type of impairment and its severity, a CWD's needs can differ as can the required extra educational cost. If individual needs arising from the type and severity of impairment are not addressed, then children with severe difficulties may face significant barriers in education. Though we find gaps for enrollment depending on disability type in our descriptive analysis, we cannot conclude if this is actually the case. Due to the smaller sample size for each disability type, we were not able to perform statistical analysis. The availability of a robust dataset with the inclusion of a short set of disability-related questions recommended by the Washington Group on Disability Statistics (2020) would help conduct future research on the topic by focusing on which impairments group are more vulnerable to household investment disparities as they relate to schooling.

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Appendix

Table A1. **Impairment-Wise Comparison of Children with and without Disabilities (Aged 5–19 Years)**

	Type of Impairment					
	Visual	**Hearing**	**Physical**	**Cognitive**	**Communication**	**Non-CWDs**
Enrollment (among school-aged children)						
Primary level	0.42	0.57	0.29	0.17	0.12	0.68
Secondary level	0.51	0.19	0.14	0.07	0.06	0.41
Higher level	0.31	0.20	0.00	0.07	0.00	0.32
Literacy (among school-aged children)						
Reading	0.71	0.49	0.39	0.22	0.22	0.66
Writing	0.98	0.98	0.95	0.95	0.96	0.96

CWDs = children with disabilities.

Notes: Enrollment rate is calculated using the proportion of enrolled children within school-aged children divided by the population of school-aged children. School age is defined following Kingdon (2005): primary level (aged 5–9 years), secondary level (aged 10–14 years), and higher level (aged 15–19 years).

Source: Authors' calculations using data from the 2010 Bangladesh Household Income Expenditure Survey.